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Nav. Basic
The solar system

Assuming mid-latitudes (40° to 50° N/S). At which time of year is the relationship between the length of day and night, as well as the rate of change of declination of the sun, changing at the greatest rate?

A) Winter solstice and autumn equinox.
B) Summer solstice and spring equinox.
C) Summer solstice and winter solstice.
D) Spring equinox and autumn equinox.

In its path around the Sun, the axis of the Earth has an inclination:

A) varying with the season of the year.
B) of 23º 27 with the plane of Equator.
C) varying between zero and 23° 27 with the plane of the pat.
D) of 66º 33 with the plane of the path.

Observed from a position on the surface of the Earth the heavenly bodies seems to:

A) move from East to West on the northern hemisphere.
B) move from West to East on the southern hemisphere.
C) not change their relative positions on the sky.
D) move from East to West.

Which of the following statements concerning ionospheric propagation errors is true?

A) They are significantly reduced when a second frequency is available.
B) They are significantly reduced by the use of RAIM.
C) Transmitting the state of the ionosphere to the receivers enables the error to reduced to less than one metre.
D) They are eliminated using differential techniques.

The mean sun:

A) Is only of interest to users of astronomical navigation.
B) Moves with constant speed along the celestial equator.
C) Is the middle position of the sun.
D) Has a declination equal to the apparent sun.

What is the highest latitude listed below at which the sun will reach an altitude of 90° above the horizon at some time during the year?

A) 0°
B) 66°
C) 23°
D) 45°

The length of a apparent solar day is not constant because:

A) The Earths speed of revolution in its orbit varies continuously, due to the orbit being elliptical.
B) The Suns declination is not constant.
C) The plane of the Ecliptic and the plane of the Equator are inclined to each other.
D) The Earths speed of rotation is not the same at all latitudes.

The planets move around the Sun:

A) At constant velocity.
B) In circular orbits.
C) At constant angular speed.
D) In elliptical orbits.

At what approximate date is the earth furthest from the sun (aphelion)?

A) Beginning of July.
B) Beginning of January.
C) End of September.
D) End of December.

Seasons are due to the:

A) Earths elliptical orbit around the Sun.
B) variable distance between Earth and Sun.
C) Earths rotation on its polar axis.
D) inclination of the polar axis with the ecliptic plane.

The direction of the Earths rotation on its axis is such that:

A) An observer on the surface of the earth always will face West when observing sunrise.
B) Any point on the surface of the Earth will move westward.
C) Any point on the surface of the Earth will move eastward.
D) Observed from the point above the North Pole, the rotation is counter-clockwise.

The suns declination is:

A) The angular distance between the sun and the celestial North Pole.
B) The suns position relative to the plane of the Equator.
C) The suns position relative to the ecliptic.
D) The distance between the sun and the horizon.

When the length of the day is measured with reference to the passage of the apparent sun:

A) The length of the day will wary in the course of the year.
B) The length of the day will be the same once every month.
C) The length of the day will vary with the latitude of the observer.
D) The length of the days, as indicated by our watches, will be exactly equal.

The term sidereal is used:

A) to describe how two positions of heavenly bodies are located sideways on the sky.
B) to describe the time interval between two successive transits of the real apparent sun at the same meridian.
C) to describe conditions with reference to the moon.
D) to describe a situation or relationship concerning the stars.

What is the approximate date of perihelion, when the Earth is nearest to the Sun?

A) End of March.
B) Beginning of January.
C) Beginning of July.
D) End of December.

The earth

Sun rise at 50° N 072° E is at 0254 on 25th January. What time will the sun rise at 50° N 007° E on that day?

A) 2154 UTC
B) 0514 UTC
C) 0714 UTC
D) 0254 UTC

The compression factor of the earth:

A) is so small that it may be ignored when making ordinary maps and charts.
B) makes the difference between the polar diameter and the equatorial diameter about 22 NM.
C) is about 1:300.
D) all 3 answers are correct.

The angle between the true great-circle track and the true rhumb-line track joining the following points: A (60° S 165° W) B (60° S 177° E), at the place of departure A, is:

A) 5.2°
B) 9°
C) 15.6°
D) 7.8°

An aircraft departing A(N40º 00´ E080º 00´) flies a constant true track of 270º at a ground speed of 120 kt. What are the coordinates of the position reached in 6 HR?

A) N40º 00´ E068º 10´ .
B) N40º 00´ E064º 20´ .
C) N40º 00´ E060º 00´ .
D) N40º 00´ E070º 30´ .

The total length of the 30° Latitude is:

A) 18.706 km
B) 18.706 nm
C) 10.800 km
D) 10.800 nm

Latitude may be defined as:

A) The angular distance measured along a meridian from the equator to a parallel of the latitude, measured in degrees, minutes, and seconds and named North or South.
B) The displacement of a place from equator.
C) The angle between the plane of the equator and the plane of the parallel of latitude.
D) The distance from equator to a place on the surface of the earth.

You are flying from A (50N 10W) to B (58N 02E). What is the Convergency between A and B?

A) 9,7°
B) 10,2°
C) 6,8°
D) 6,5°

The convergency of meridians:

A) Is the distance between the meridians in degrees, minutes, and seconds.
B) Is greater using rhumb line track than using great circle.
C) Is the angular difference between the meridians.
D) Is independent of latitude and longitude.

The maximum difference between geocentric and geodetic latitude occurs at about:

A) 90° North and South.
B) 60° North and South.
C) 45° North and South.
D) 0° North and South (equator).

The poles on the surface of the earth may be defined as:

A) The points at which the vertical lines runs through the centre of the earth.
B) The points where the earths axis of rotation cuts the surface of the earth.
C) The points from where the distance to the equator is equal.
D) The points on the surface of the earth where all meridians intersect at right angles.

What is the UTC time of sunrise in Vancouver, British Columbia, Canada (49N 123 30 W) on the 6th December?

A) 1552 UTC
B) 0724 UTC
C) 0738 UTC
D) 2324 UTC

What is the convergency at 5000N between the meridians 10500W and 14500W on the earth?

A) 40,0°
B) 50,0°
C) 30,6°
D) 32,1°

Parallels of latitude, except the equator are:

A) Rhumb lines.
B) Great circles.
C) are neither Rhumb lines nor Great circles.
D) both Rhumb lines and Great circles.

What is the highest latitude on the Earth at which the Sun can be vertically overhead?

A) 90 deg.
B) 66 deg.
C) 45 deg.
D) 23 deg.

What is the approximate latitude of the Antarctic Circle?

A) 23° S.
B) 66° S.
C) 66° N.
D) 23° N.

A great circle track joins position A (59° S 141° W) and B (61° S 148° W). What is the difference between the great circle track at A and B?

A) It increases by 3° .
B) It decreases by 3° .
C) It increases by 6° .
D) It decreases by 6° .

If an aeroplane was to circle around the Earth following parallel 60° N at a ground speed of 480 kt. In order to circle around the Earth along the equator in the same amount of time, it should fly at a ground speed of:

A) 240 kt.
B) 480 kt.
C) 550 kt.
D) 960 kt.

In which two months of the year is the difference between the transit of the Apparent Sun and Mean Sun across the Greenwich Meridian the greatest?

A) April and August.
B) March and September.
C) June and December.
D) February and November.

A correct definition of longitude is:

A) The arc at equator between the Greenwich meridian and the meridian of the place, measured in degrees, minutes and seconds, named East or West.
B) The East-West distance between Greenwich and the place.
C) The angle between the Greenwich meridian and the meridian of the place.
D) The difference between the Greenwich meridian and the meridian of the place, measured at the centre of the earth.

The diameter of the Earth is approximately:

A) 40 000 km.
B) 18 500 km.
C) 12 700 km.
D) 6 350 km.

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21. The circumference of the parallel of latitude at 60° N is approximately:

A) 10 800 NM.
B) 18 706 NM.
C) 20 000 NM.
D) 34 641 NM.

A Parallel of Latitude is a:

A) Small circle.
B) Rhumb line.
C) Meridian of tangency.
D) Great circle.

An approximate equation for calculating the convergency between two meridians is:

A) Convergency=60 x dlong x cos. lat.
B) Convergency= dlong x sin mean lat.
C) Convergency= dlat x sin mean long
D) Convergency= dlong x cos. lat.

Given: value for the ellipticity of the Earth is 1/297. Earths semi-major axis, as measured at the equator, equals 6378.4 km. What is the semi-minor axis (km) of the earth at the axis of the Poles?

A) 6 367.0
B) 6 399.9
C) 6 356.9
D) 6 378.4

The suns declination is on a particular day 12.00 S. Midnight sun may this day be observed:

A) South of 7800S.
B) North of 7800S.
C) At 7800S only.
D) North of 7800N.

The angle between the plane of the Equator and the plane of the Ecliptic is:

A) 25.3 deg.
B) 65.6 deg.
C) 66.5 deg.
D) 23.5 deg.

Consider the following statements on longitude.

A) Longitude is stated in degrees up to 360º .
B) The largest value of longitude is 180º .
C) The largest value of change of longitude is 90º .
D) The value of longitude will never exceed 90º .

The term Ellipsoid may be used to describe:

A) the shape of the ecliptic.
B) a great circle on the celestial sphere.
C) the movement of the earth around the sun.
D) the shape of the earth.

A small circle:

A) has a plane parallel to the earths axis of rotation.
B) has a plane that do not pass through the centre of the earth.
C) will also be a rhumb line.
D) will always cross equator.

At what latitude does the maximum difference between geodetic and geocentric latitude occur?

A) 45 deg.
B) 0 deg.
C) 60 deg.
D) 90 deg.

A Rhumb Line is:

A) always a great circle.
B) a line that crosses meridians at a constant angle.
C) a line that crosses lines of latitude at a constant angle.
D) a line that crosses the equator at a constant angle.

When the suns declination is northerly:

A) the sunrise occurs earlier at southern latitudes than the northern latitudes.
B) the daylight period is shorter in the southern hemisphere than the northern.
C) midnight sun may be observed at the south pole.
D) it is winter on the northern hemisphere.

The shortest distance between 2 point of the surface of the earth is:

A) half the rhumb line distance.
B) Rhumb line.
C) a great circle
D) the arc of a great circle

Consider the following statements on the properties of a great circle:

A) The great circle running through two positions on the surface of the earth, is the shortest distance between these two positions.
B) The great circle will maintain their initial true direction.
C) All 3 answers are correct.
D) The parallels of latitudes are all great circles.

The earth may be referred to as:

A) round.
B) an oblate spheroid.
C) elliptical
D) a globe.

How many nm are equivalent to 1° of arc of latitude:

A) 600 nm
B) 15 nm
C) 60 nm
D) 1 nm

At what approximate latitude is the length of one minute of arc along a meridian equal to one NM (1852 m) correct?

A) 0°
B) 30°
C) 90°
D) 45°

Position A is at latitude 33º 45N and position B is at latitude 14º 25N. What is the change in latitude between A and B?

A) 19º 20
B) 48º 10
C) 76º 15
D) 23º 45

If an aircraft flew around the world at latitude 60° N it would cover a distance of:

A) 21,600 nm.
B) 10,800 nm.
C) 18,700 nm.
D) 5,400 nm.

The prime meridian is:

A) the meridian 180 (E/W).
B) the mid meridian on a chart.
C) the meridian running through Greenwich, England.
D) the meridian having the highest value of longitude.

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21. The equator is located:

A) on the surface of the earth and at right angles to the axis of rotation.
B) on the surface as a small circle, horizontal to the axis of rotation.
C) on the surface parallel to the magnetic equator.
D) on the surface of the earth, being a circle whose plane is perpendicular to the axis of the earth and cutting through the centre of the earth.

An arc of 1 minute of a meridian equals:

A) 10 kilometres.
B) 1 kilometre.
C) 1 nautical mile.
D) 1 statute mile.

Consider the following statements on meridians:

A) The meridians are parallel only at equator.
B) Any two halves great circle will form a meridians.
C) The meridians are not of equal length.
D) Any two meridians will form a great circle.

An aircraft is flying around the Earth eastwards along the 60N parallel of latitude at a groundspeed of 240 knots.
At what groundspeed would another aircraft have to fly eastwards along the Equator to fly once round the Earth in the same journey time?

A) 240 knots.
B) 480 knots.
C) 120 knots.
D) 600 knots.

Radio bearings:

A) are Great circles.
B) cut all meridians at the same angle.
C) are lines of fixed direction.
D) are Rhumb lines.

The inclination of the earths axis of rotation with the plane of the ecliptic:

A) is causing the seasons, summer and winter.
B) is stable throughout the year.
C) All 3 answers are correct.
D) is causing the variation of length of the daylight during a year.

Using latitude and longitude for a place:

A) The location on the earths surface of this place is defined.
B) The distance from this place to another play may be easily calculated.
C) Relative directions to another place may easily be calculated.
D) The direction from the place to any other place may be easily calculated.

The highest value of longitude is found:

A) At Greenwich anti meridian.
B) Close to the poles.
C) Close to the prime meridian.
D) Along equator.

An aircraft at latitude 02° 20N tracks 180° (T) for 685 km. On completion of the flight the latitude will be:

A) 09° 05S.
B) 04° 30S.
C) 03° 50S.
D) 04° 10S.

Consider the following statements on the shape of the earth:

A) The longest diameter is between the poles.
B) The diameter at the equator is about 60 NM longer than the diameter between the poles.
C) It is slightly flattened at the poles.
D) The diameters of the earth is the same at all latitudes.

What is the standard formula for convergency?

A) Convergency=dlat x cos mean latitude.
B) Convergency=dlat x sin mean latitude.
C) Convergency=dlong x sin mean latitude.
D) Convergency=dlong x cos mean latitude.

Generally what line lies closer to the pole?

A) Equator.
B) Rhumb line.
C) Great line.
D) The rhumb line or great circle depending on the chart used.

The latitude where the value of convergency is half the value of convergency at 60° N is:

A) 30° 00 N
B) 25° 39 N
C) 90° 00 N
D) 27° 52 N

Given: The coordinates of the heliport at Issy les Moulineaux are: N48° 50 E002° 16.5 The coordinates of the antipodes are:

A) S41° 10 E177° 43.5.
B) S48° 50 E177° 43.5.
C) S41° 10 W177° 43.5.
D) S48° 50 W177° 43.5.

The suns moves from East to West at a speed of 15° longitude an hour. What ground speed will give you the opportunity to observe the sun due south at all times at 6000N?

A) 300 Kt.
B) 780 Kt.
C) 450 Kt.
D) 520 Kt.

A great circle is defined as:

A) A circle on the surface of a sphere, whose plane is cutting through the centre of the sphere.
B) A circle running on the outside of the sphere.
C) A circle in any plane on the surface of a sphere.
D) A circle on the surface of the sphere, with its plane running perpendicular to the axis of rotation.

If you want to follow a constant true track value:

A) You, in most cases, will also fly the shortest possible track.
B) You must fly a rhumb line.
C) You must fly a great circle.
D) You must fly east/west or North/south.

The circumference of the Earth is approximately:

A) 43200 nm.
B) 21600 nm.
C) 5400 nm.
D) 10800 nm.

Which of the following statements concerning the earths magnetic field is completely correct?

A) At the earths magnetic equator, the inclination varies depending on whether the geographic equator is north or south of the magnetic equator.
B) Dip is the angle between total magnetic field and vertical field component.
C) The blue pole of the earths magnetic field is situated in North Canada.
D) The earths magnetic field can be classified as transient semi-permanent or permanent.

An aircraft flies the following rhumb line tracks and distances from position 04° 00N 030° 00W: 600 NM South, then 600 NM East, then 600 NM North, then 600 NM West. The final position of the aircraft is:

A) 04° 00N 029° 58W
B) 03° 58N 030° 02W
C) 04° 00N 030° 02W
D) 04° 00N 030° 00W

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61. The angle between the plane of the ecliptic and the plane of equator is approximately:

A) 25.3° .
B) 23.5° .
C) 27.5° .
D) 66.5° .

Consider the following statements on meridians:

A) All meridians run in true direction from South to North.
B) On the southern hemisphere the meridians run towards the south pole.
C) The distance, in nautical miles, between two selected meridians will be constant.
D) The relative direction between two selected meridians will be constant.

Conversion angle is:

A) convergency.
B) 0,5 convergency
C) twice convergency.
D) 4 times convergency.

At what approximate date is the earth closest to the sun (perihelion)?

A) Beginning of January.
B) End of June.
C) Beginning of July.
D) End of March.

What is the angle between the plane of the Ecliptic and the plane of the Equator?

A) 0° .
B) 90° .
C) 23° .
D) 45° .

What is the initial great circle direction from 45° N 14° 12W to 45° N 12° 48E?

A) 270° (M)
B) 86,5° (T)
C) 80,4° (T)
D) 090° (M)

In order to fly from position A (10° 00N, 030° 00W) to position B (30° 00N, 050° 00W), maintaining a constant true course, it is necessary to fly:

A) a rhumb line track.
B) the constant average drift route.
C) the great-circle route.
D) a straight line plotted on a Lambert chart.

What is a line of equal magnetic variation?

A) An isocline.
B) An isovar.
C) An isogriv.
D) An isogonal.

Given: Great circle from P to Q measured at P=095° Southern hemisphere Conversion angle P - Q =7° What is the rhumb line track P - Q?

A) 081
B) 102
C) 088
D) 109

The term Aphelion is used to describe:
A) The situation when apparent sun is passing the plane of the Equator.
B) The situation when the distance between the sun and the earth is at its longest.
C) The relationship between the length of the day and the length of the night.
D) The relative position between the earth and the moon.

A line which cuts all meridians at the same angle is called a:
A) Agonic line.
B) Rhumb line.
C) Line of variation.
D) Great circle.

Consider the following statements on departure:
A) As the difference of longitude increases, the departure is constant it the latitude is constant.
B) Departure is independent of difference of longitude.
C) Departure may be calculated using the equation: departure=Sin Lat. x sin Long.
D) As the latitude increases, the departure between two meridians decreases.

A Great Circle is:
A) a straight line joining two points on all charts.
B) a line that defines the shortest distance between two points on the surface of the earth.
C) always a Great Circle on all charts.
D) a line on the surface of the earth which crosses meridians at a constant angle.

As seen from an observer on the surface of the earth:
A) the apparent sun is always in the plane of the ecliptic.
B) the suns position relative to the stars is fixed throughout the year.
C) the stars will seem to move from west to east during a year.
D) the sun is in a fixed position relative to the stars.

The main reason that day and night, throughout the year, have different durations is due to the:
A) earths rotation.
B) relative speed of the sun along the ecliptic.
C) gravitational effect of the Sun and the Moon on the speed of rotation of the Earth.
D) inclination of the ecliptic to the equator.

An RMI indicates aircraft heading. To convert the RMI bearings of NDB' s and VOR' s to true bearings the correct combination for the application of magnetic variation is:
A) NDB: beacon position VOR: aircraft position
B) NDB: beacon position VOR: beacon position
C) NDB: aircraft position VOR: beacon position
D) NDB: aircraft position VOR: aircraft position

An approximate equation for calculation conversion angle is:
A) CA=dlong x sin Lat. x sin Long.
B) CA=0,5 x dlong x sin lat.
C) CA=(dlong-dlat) x 0,5.
D) CA=0,5 x dlat x sin Lat.

The great circle track X - Y measured at x is 319° , and Y 325° Consider the following statements:
A) Northern hemisphere, Rhumb line track is 322° .
B) Southern hemisphere, Rhumb line track is 322° .
C) Southern hemisphere, Rhumb line track is 331° .
D) Northern hemisphere, Rhumb line track is 313° .

Time and conversions:

What does 5 hours 50 minutes and 20 seconds change of longitude represent?

A) 81° 25
B) 35° 15
C) 80° 05
D) 87° 35

A day is by definition:

A) the period from sunrise to sunset.
B) the period from morning to evening.
C) the period in which day flying is authorised.
D) the period elapsed between two successive transits of a heavenly body.

Atmospheric refraction:

A) Causes the Sunrise and the Sunset to occur earlier.
B) Causes the Sunrise to occur later and the Sunset to occur earlier.
C) Causes the Sunrise and the Sunset to occur later.
D) Cause the Sunrise to occur earlier and the Sunset to occur later.

On the 27th of February, at 52° S and 040° E, the sunrise is at 0243 UTC. On the same day, at 52° S and 035° W, the sunrise is at:

A) 0243 UTC.
B) 0523 UTC.
C) 2143 UTC.
D) 0743 UTC.

How would you define standard time in relation to Greenwich Mean Time?

A) It is local mean time adjusted to standard time.
B) It is local mean time adjusted for latitude.
C) It is another term for UTC.
D) It is local mean time.

What is the Standard Time in Hawaii when it is 0600 ST on the 16th February in Queensland, Australia?

A) 2000 ST on the 15th.
B) 1000 ST on the 17th.
C) 1000 ST on the 15th.
D) 1000 ST on the 16th.

The times given for Sunrise, Sunset, Morning and Evening twilight in the Air Almanac:

A) Must always be corrected for atmospheric refraction.
B) Are given in LMT.
C) Are given in Standard time.
D) Are given in UTC.

A is at longitude 01230E and B is at longitude 04315E. LMT in B is 1749. What is the LMT in A?

A) 1546
B) 1952
C) 1706
D) 1456

If the Mean Sun moves 121° 30 along the Equator, that equals:

A) 9 hours 15 minutes.
B) 8 hours 06 minutes.
C) 6 hours 20 minutes.
D) 20 hours 10 minutes.

How long time does it take for the Mean Sun to move from meridian 14515E to meridian 02345W?

A) 8 hours 06 minutes.
B) 6 hours 15 minutes.
C) 11 hours 16 minutes.
D) 9 hours 41 minutes.

At 2200 Standard Time, 15th August in Brasilia 1600S 4800W, the Standard Time and Date in Kwajalein Island (Marshall Islands) 0900N 16740E is:

A) 0700 16 August
B) 0700 15 August
C) 1300 16 August
D) 1300 15 August

The time is 1830 UTC on 2 December, the Standard Time and date in Hong Kong 2219N 11412E is:

A) 0230 3 December.
B) 0207 3 December.
C) 1030 2 December.
D) 0630 3 December.

The Equation of time?

A) Is used when calculating the difference between UTC and LMT.
B) States the difference in time of transit of the Mean sun and the Apparent sun any particular day.
C) States the difference between celestial time and apparent time.
D) Is used to calculate mean time when standard time is known.

The Local Mean Time at longitude 095° 20W, at 0000 UTC, is:

A) 1738:40 same day.
B) 1738:40 previous day.
C) 0621:20 previous day.
D) 0621:20 same day.

Consider the following statements on Sunrise and Sunset.

A) In November sunset occurs earlier at 4500S than at 4500N.
B) In July the period of sunlight is longer at 1500S than at 1500N.
C) At equator sunrise and sunset occur at quite regular times throughout the year.
D) In May sunrise occurs later at 4500N than at 4500S.

The LMT and date at a longitude of 00100W is 1330 on the 6 January, what is the LMT and date at a longitude of 15900E:

A) 0010 7 January
B) 0046 7 January
C) 0010 5 January
D) 0006 7 January

An aircraft leaves Guam (13° N 144° E) at 23:00 ST on 30th April to fly to Los Angeles, California, USA. If the flight time is 11 hrs 15 mins what is the Standard Time and date of arrival in Los Angeles?

A) 17:15 on the 1st of May.
B) 09:45 on the 30th of April.
C) 17:15 on the 30th of April.
D) 04:15 on the 1st of May.

What is the Local Mean Time at 65° 30N 123° 45W at 22:00 UTC on 6th September?

A) 13:45 on 6th.
B) 06:15 on 7th.
C) 02:22 on 7th.
D) 17:38 on 6th.

When approaching the International Date Line from the East, you:

A) should be prepared to increase your date by 1.
B) should increase your date by an extra date at the first midnight you experience.
C) should not change date at the first midnight you experience.
D) should be prepared to decrease your date by 1.

Which is the highest latitude listed below at which the sun will rise above the horizon and set every day?

A) 66° .
B) 62° .
C) 72° .
D) 68° .

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21. Daylight Saving Time (Summer Time):

A) Is introduced by setting the standard time forward by one hour.
B) Is used to extend the sunlight period in the evening.
C) All 3 answers are correct.
D) Is used in some countries.

G is in position 3500N 03445W. For a particular date sunrise at 3500N is in the Air Almanac listed as 0715.
What is the time of sunrise at G, given in UTC?

A) 0456 UTC.
B) 0715 UTC.
C) 0504 UTC.
D) 0934 UTC.

UTC stands for:

A) Universal time constant.
B) Universal Time Coordinated.
C) Universal Time Coefficient.
D) Universal Time Compensated.

At 1200 Standard Time on the 10th July in Queensland, Australia, what is the Standard Time in Hawaii, USA?

A) 1000 ST 10 July.
B) 1600 ST 09 July.
C) 0200 ST 10 July.
D) 1200 ST 10 July.

What is the definition of EAT?

A) Estimated initial approach fix time.
B) Estimated final approach fix time.
C) Estimated on-blocks arrival time.
D) Estimated time overhead the destination airfield.

The countries having a standard time slow on UTC:

A) will generally be located at eastern longitudes.
B) will often experience sunrise earlier than the sunrise occurs at the Greenwich meridian.
C) will often have an earlier standard date than the UTC date.
D) will generally be located at western longitudes.

What is the definition of Morning Civil Twilight?

A) The period in the morning, just before sunrise.
B) Morning civil twilight is the period in the morning from the centre of the sun is 6° below the horizon until the upper limb of the sun appears at the horizon.
C) The period when the sun, in the morning, has its centre between 6° under the horizon and the horizon.
D) The period of semi-darkness in morning.

A day at a place as measured in local mean time starts:

A) when the mean sun transits the anti meridian of the place in question.
B) when the mean sun transits the Greenwich meridian.
C) when the mean sun transits the 180E/W meridian.
D) when the mean sun transits the meridian of the place in question.

In which months is the difference between apparent noon and mean noon the greatest?

A) November and February.
B) January and July.
C) June and December.
D) March and September.

The time it takes for the Earth to complete one orbit around the Sun is:

A) 360 days 5 hours 45 minutes 48 seconds.
B) 360 days 45 hours, 5 minutes 48 seconds.
C) 365 days 45 hours 48 minutes 5 seconds.
D) 365 days 5 hours 48 minutes 45 seconds.

Apparent Time is:

A) Based on the time of transit of the apparent Sun.
B) The average time, calculated from the movements of the Sun and the stars.
C) The correct time, as it appears on our watches and clocks.
D) The time that is apparent to everybody; in other words the official time.

What is the local mean time, position 65° 25N 123° 45W at 2200 UTC?

A) 1345.
B) 0615.
C) 0815.
D) 2200.

Twilight:

A) are the periods when an observer is illuminated by both direct and indirect rays of light from the sun.
B) are periods when it is too dark to move around without artificial lighting.
C) are periods when it is nearly dark.
D) are the periods before sunrise and after sunset when the light is lower than when the sun is above the horizon.

A flight departs Auckland (New Zealand) 3650S 17446E, at 0600 Standard Time on the 23 January. The flight time is 9 hours 27 minutes, the Standard Time and date of arrival at Santiago (Chile) 3300S 07100W will be:

A) 2327 22 January
B) 0727 24 January
C) 2327 23 January
D) 2327 24 January

It is noon Standard Time in Norfolk Island 2900S 16755E on 16 July. What is the LMT and date in Johnston Island 1644S 16932W:

A) 1148 16 July
B) 1332 15 July
C) 1430 15 July
D) 1312 15 July

What is the meaning of the term standard time?

A) It is another term for UTC.
B) It is the time set by the legal authorities for a country or part of a country.
C) It is the time zone system applicable only in the USA.
D) It is ah expression for local mean time.

Civil Twilight occurs between:

A) sunset and 6 deg below the horizon.
B) 6 deg and 12 deg below the horizon.
C) sunrise and sunset.
D) 12 deg and 18 deg below the horizon.

The length of daylight changes with the declination of the sun. In mid- latitudes (45° N/S) when is the rate of change greatest?

A) Aphelion (July).
B) Perihelion (January).
C) The solstices (June and December).
D) The equinoxes (March and September).

The duration of twilight:

A) Is generally longer in positions at high latitudes that in positions at lower latitudes.
B) Is independent of the suns declination, and only depends on the observers latitude and longitude.
C) Will in the period around the Equinoxes increase as you approach the equator from North or South.
D) Is longer in the morning than in the evening, because of the refraction in the atmosphere.

Times of Sunrise and Sunset is in the Air Almanac only given for one particular time in every 24 hour period.
These data are accurate:

A) All 3 answers are correct.
B) enough to be used for all longitudes, when calculating light conditions.
C) only for the places on the Greenwich meridian.
D) but may call for an adjustment if the observer is at a high altitude.

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41. Begin of morning civil twilight and end of evening civil twilight are defined by:

A) sun altitude is 18° below the celestial horizon.
B) sun altitude is 6° below the celestial horizon.
C) sun altitude is 12° below the celestial horizon.
D) sun upper edge tangential to horizon.

Some standard times may differ from UTC by other times than whole hours, because:

A) it has been considered highly desirable that the sunlight period of the day is balanced around noon, standard time.
B) some areas have limited communication with neighbouring areas, which does not call for co-ordinated standard times.
C) All 3 answers are correct.
D) the political authorities have emphasised the importance of the sunlight period in a particular position.

The duration of civil twilight is the time:

A) agreed by the international aeronautical authorities which is 12 minutes.
B) needed by the sun to move from the apparent height of 0° to the apparent height of 6° .
C) between sunset and when the centre of the sun is 12° below the true horizon.
D) between sunset and when the centre of the sun is 6° below the true horizon.

The main reason that day and night, throughout the year, have different duration, is due to the:

A) inclination of the ecliptic to the equator.
B) gravitational effect of the sun and moon on the speed of rotation of the earth.
C) earths rotation.
D) relative speed of the sun along the ecliptic.

The International Date Line is located:

A) At the 180° E/W meridian, or in the vicinity of this meridian.
B) At all latitudes on the 180° E/W meridian.
C) At the Greenwich meridian.
D) At the apparent suns anti meridian.

Civil twilight is defined by:

A) sun altitude is 12° below the celestial horizon.
B) sun altitude is 18° below the celestial horizon.
C) sun altitude is 6° below the celestial horizon.
D) sun upper edge tangential to horizon.

An aircraft departs Hong Kong 2219N 11412E at 2234 Standard Time on the 17 April. If the flight time is 11 hours 17 minutes, the Standard Time and date of arrival at Honolulu (Hawaii) 2125N 15755W will be:

A) 1151 17 April
B) 1551 17 April
C) 1151 18 April
D) 0551 18 April

Consider the following statements on sunset:

A) Sunset is the time when the observer at sea level see the last part of the sun disappear below the horizon.
B) At sunset the centre of the sun is at the observers horizon.
C) Night-flying regulations start at the time of sunset.
D) For positions at the same longitude, sunset will occur simultaneously at all latitudes.

Standard time is:

A) the time enforced by the legal authority to be used in a country or an area.
B) the time most frequently used for air navigation.
C) the time used at a particular meridian.
D) the time which is accepted and used as a standard for the whole world.

Mean time has been introduced in order to:

A) Save us the problem of adjusting our watches entering every leap year.
B) Compensate for the irregularities of the speed of rotation of the Earth around it is axis.
C) Have one fixed time to be used within the border of a country.
D) Introduce a constant measurement of time, independent of the daily variations in the movement of the Sun as observed from the Earth.

What is the time (UTC) of sunrise on 6th December at Vancouver, British Columbia, Canada (50° N 123° W)?

A) 23:42 on 5th.
B) 23:30 on 5th.
C) 15:54 on 6th.
D) 15:42 on 6th.

On 4 February the Air Almanac lists 1941 as the time of sunset at 5000S. An observer register sunset at 2113 UTC this day. What is the observers position?

A) 5000S 01035E.
B) 5000S 02200E.
C) 5000S 01035W.
D) 5000S 02300W.

Directions:

Compass deviation is caused by:

A) The difference in the location of the Earths Magnetic and Geographic Poles.
B) The angle of magnetic dip.
C) The angle of inclination.
D) Aircraft magnetism distorting the Earths magnetic field.

The forces acting upon the compass needle in a stand-by compass in an aircraft, are:

A) the Earths magnetic field, the aircraft magnetic field and the effects of attitude and movement of the aircraft.
B) the Earths magnetic field, the Coriolis effect and aircraft magnetism.
C) the total magnetic field in the compass location.
D) mechanic forces only.

Directions are stated:

A) In degrees with reference to True North when plotted with reference to the latitude/longitude grid on a chart.
B) As a reference direction and a number of degrees.
C) All 3 answers are correct.
D) In degrees in a 360(system, starting out clockwise from the reference direction).

In direct reading magnetic compass, the effect of dip is counteracted by:

A) Compass liquid.
B) The shape of the casing.
C) Powerful magnets.
D) Low centre of gravity.

On the earths surface points of equal dip are known as:

A) isogonals.
B) isoclinals.
C) aclinic.
D) agonic.

In the areas close to the magnetic poles compasses are not to any use in air navigation, mainly because:

A) The field strength of the Earths magnetic field is at it is weakest in this area.
B) The inclination is insufficient in these areas.
C) The distance from the magnetic equator is too long.
D) The horizontal component of the Earths magnetic field is too weak.

A magnetic compass will show an apparent turn to the North in the Southern Hemisphere when:

A) the aircraft decelerates on 270 (C).
B) the aircraft accelerates on 000 (C).
C) the aircraft accelerates on 090 (C).
D) the aircraft accelerates on 180 (C).

True North is:

A) Is in any direction out from the true north pole.
B) The direction along a meridian.
C) The direction along any meridian toward the true north pole.
D) The direction along the meridian, toward the north pole when on the northern hemisphere and toward the south pole when on the southern hemisphere.

Referring to the Earths magnetic field:

A) the inclination is 90° at the geographical poles.
B) the inclination decreases with increased geographical latitude.
C) the dip is maximum at the magnetic equator
D) the inclination is 90° at the magnetic poles.

From position A (04° N 030° W) an aircraft flies 600 NM due south, then 600 NM due east, the 600 NM due north, then 600 NM due west. What is the aircrafts final position in relation to A?

A) Due south of A.
B) Due west of A.
C) Due east of A.
D) Overhead A.

The north and south magnetic poles are the only positions on the earths surface where:

A) the value of magnetic variation equals 90° .
B) a freely suspended compass needle will stand vertical.
C) a freely suspended compass needle will stand horizontal.
D) isogonal converge.

Grivation is:

A) Is the sum of Grid convergence, variation and deviation
B) Is the sum of Grid convergence and deviation
C) Is the sum of variation and deviation
D) Is the sum of Grid convergence and variation

What is variation at the magnetic equator?

A) 180° E/W.
B) Less than 90° .
C) Between 45° and 90° .
D) Zero.

Variation is called Westerly when:

A) the Magnetic Meridian is to the West of Compass North.
B) magnetic North is to the West of True North.
C) true North is to the West of Magnetic North.
D) the magnetic meridian is to the West of 180° parallel.

The magnetic north pole seems to rotate around the geographical north pole. A complete rotation takes about:

A) 11 years.
B) 1 degree each 5. year.
C) 4 years.
D) 1 degree each 9. year.

The remote compass system remains synchronised in a turn because:

A) the follow up motor keeps the compass synchronised.
B) it is sensing the earths electrical field automatically.
C) the precession circuit is activated causing the gyro to follow the turn.
D) the signals from the detector unit to the signal Selsyn change at the same rate as the rotor of the signal Selsyn turns.

Grid convergence:

A) is easterly in all positions having westerly longitude.
B) is easterly for positions east of the grid datum meridian on the northern hemisphere.
C) is westerly for positions east of the grid datum meridian on the northern hemisphere.
D) is easterly in all positions having easterly longitude.

Grivation is 56W when:

A) Grid convergence is 58W and deviation is 2E.
B) Grid convergence is 46W and variation is 10E.
C) GH is 103° and MH is 159° .
D) GH is 156° and MH is 103° .

Convergence is:

A) the angle of inclination of meridians towards each other.
B) the angular change of direction of a Rhumb Line course as it passes one meridian to another.
C) the angle at which a meridian cuts the Equator.
D) the angle of inclination of one parallel of latitude with another.

Preparing a chart for use of grid means:

A) Selecting a meridian on the chart and drawing lines on the chart, parallel to the meridian selected.
B) Pre-calculating grid directions for all positions marked on the chart.
C) Selecting suitable grid tracks, position line and bearings.
D) Mark the chart with lines and values for grid latitude and longitude.

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21. On the earths surface, points of zero dip are known as:

A) isogonals.
B) isoclinals.
C) aclinic.
D) agonic.

Required track 300° T, drift 8° right, variation 10° W, deviation -4° . What is the required compass heading?

A) 310°
B) 298°
C) 306°
D) 314°

The lines on the earths surface that join points of equal magnetic variation are called:

A) isoclines.
B) isogrives.
C) isotachs.
D) isogonals.

The magnetic meridian in a position is:

A) The direction in which a freely suspended magnet will point in that position.
B) The direction of the great circle running from the magnetic south pole to the magnetic north pole, measured in the position.
C) The horizontal direction of the Earths magnetic field in that position, toward the magnetic north pole.
D) The direction in the Earths magnetic lines of force in the position.

The Initial Great Circle Track from A (S 27° 30 E 017° 45) to B (S 27° 30 E 029° 15) is:

A) 092.65°
B) 088.34°
C) 087.35°
D) 091.61°

A compass swing should be conducted:

A) with the engine shut down.
B) with no crew onboard
C) with the radio equipment off.
D) with the engine running.

The initial great circle track from A (S 30° 45 E 045° 15) to B(S 30° 45 E 062° 38) is:

A) 088.9°
B) 099.9°
C) 094.4°
D) 098.7°

With reference to the remote compass system. The precession rate of the gyro is kept low in order to:

A) maintains the gyro axis in the vertical plane.
B) allow the master unit to follow the gyro unit.
C) suppress turning and acceleration errors.
D) maintain the gyro axis in the horizontal plane.

The Great Circle bearing of B (70° S 060° E), from A (70° S 030° W), is approximately:

A) 135° (T)
B) 090° (T).
C) 315° (T).
D) 150° (T).

Magnetic variation:

A) is the angle between true and magnetic north and has a maximum value of 180° .

B) is the angle between compass and magnetic north and has a maximum value of 180° .

C) is the angle between compass and magnetic north and cannot exceed 90° .

D) is the angle between true and magnetic north and is zero at the equator.

The type of compass least likely to suffer from parallax is:

A) directional indicator.

B) direct reading compass.

C) a standby compass.

D) remote reading compass.

Isogrives are lines that connect positions that have:

A) the same grivation.

B) the same horizontal magnetic field strength.

C) the same variation.

D) O° magnetic dip.

What is the convergence given that two meridians at latitude 60º are 40º apart:

A) 26.52°

B) 54.64°

C) 34.64°

D) 31.21°

On the earths surface points of equal variation are:

A) isoclinals.

B) isogonal.

C) aclinic.

D) agonic.

A Great Circle passes through point A and point B. The initial track through A is 350º and the final track through B is 290º . The Convergence Angle is:

A) -60º

B) +60º

C) -120º

D) +120º

The purpose of establishing a grid is:

A) To make the system of latitude and longitude available on a gridded map.

B) To provide a system for directions where a great circle has a constant direction, even if its true direction varies.

C) Make a chart covering high latitudes that has the same qualities as the equatorial Mercator chart.

D) Minimise the errors introduced when making calculations involving variation.

Distances

The term departure used in navigation also have the following meaning:
A) Angular distance along a meridian.
B) Angular distance along a parallel of latitude.
C) Distance in direction East/West, given in nautical miles.
D) Distance North/South.

Kilometre is defined as:
A) 0,621 Statute mile.
B) 0,454 Nautical mile.
C) a 1/10000 part of the meridian length from Equator to the pole.
D) the mean length of a 1/40000 part of the Equator.

When dealing with heights and altitudes in international aviation, we use the following units:
A) Metre and Foot.
B) Foot, Kilometre and decimals of Nautical mile.
C) All 3 answers are correct.
D) Foot and Yard.

How many feet are there in a nm?
A) 6080 ft
B) 5280 ft
C) 1000 ft
D) 3280 ft

A Nautical mile is defined as:
A) The length of a 1 minute arc, measured anywhere on the surface of the Earth.
B) The average length of a 1' arc of longitude and a 1' arc of latitude.
C) 1855 metres.
D) The average length of a 1 minute arc of a meridian.

How long is 25 Kilometres at 6000N?
A) 13,5 Nautical mile
B) 46,3 Nautical mile
C) 40,2 Statute miles
D) 27,0 Nautical mile

Assuming the Earth being a perfect sphere:
A) All 3 answers are correct.
B) a 1 minute arc measured on the surface of the Earth will be equally long wherever it is measured.
C) distances will vary, dependant on their directions.
D) distances will vary, dependant on the latitude.

How many feet are equivalent to 9,5 km?
A) 9.500 ft
B) 50.160 ft
C) 57.760 ft
D) 31.160 ft

A position P is located at 23º 45’ N, how many nautical miles is this point from the Equator?
A) 1488 nm
B) 1425 nm
C) 1535 nm
D) 1399 nm

In international aviation the following units are used for horizontal distance:
A) Metres, Kilometres and Nautical miles.
B) Metres, Statute miles and Nautical miles.
C) Kilometres, Statute miles and Nautical miles.
D) Kilometres, Feet and Nautical miles.

Consider the following statements:
A) All 3 statements are correct.
B) The exact length 1 minute of arc varies a little from position to position because the Earth radius vary.
C) In any position on the surface of the Earth, the length of 1 of arc East/West is equal to the length 1 minute of arc North/South in the same position on a perfect sphere.
D) The exact length 1 minute of arc is shorter at high altitude than at sea level, when the arc is observed from the centre of the Earth.

How many centimetres are equivalent to 36,25 inches?
A) 0,014 m
B) 14,27 cm
C) 92,08 cm
D) 11,05 cm

1 nautical mile equals:
A) 0,869 Statute mile.
B) 6076 feet.
C) 3281 Yards.
D) 1855 metres.

An aircraft leaves ORLANDO FLORIDA (N 28° 32 W 081° 20) at 08:20 Z, GS 375. The ETA at TENERIFE. CANARIES (N 28° 32 W 016° 16) is:
A) 17:29 Z
B) 17:59 Z
C) 17:18 Z
D) 17:45 Z

How many feet are there in 1 sm?
A) 1000 ft
B) 6080 ft
C) 5280 ft
D) 3280 ft

The International Nautical Mile defined by ICAO is equivalent to … m.
A) 1.852 m
B) 1.962 m
C) 1.652 m
D) 1.582 m

How many feet are there in a km?
A) 6080 ft
B) 5280 ft
C) 3280 ft
D) 1000 ft

The distance from A (S 27° 43 W 005° 15) to B(S 27° 43 E 018° 29):
A) 1151 nm
B) 1261 nm
C) 1299 nm
D) 709 nm

Magnetism and compasses
General principles:

1. An isogonal is:
A) a line of equal wind speed.
B) a line of equal magnetic variation.
C) a line of equal magnetic deviation.
D) a line of zero magnetic variation.

2. An agonic line joins places of
A) zero magnetic variation.
B) equal magnetic deviation.
C) equal horizontal force H.
D) equal magnetic variation.

3. At the magnetic equator:
A) the isogonal is an agonic line.
B) deviation is zero.
C) dip is zero.
D) variation is zero.

4. When turning right from 330° (C) to 040° (C) in the northern hemisphere, the reading of a direct reading magnetic compass will:
A) over-indicate the turn and liquid swirl will increase the effect.
B) under-indicate the turn and liquid swirl will decrease the effect.
C) over-indicate the turn and liquid swirl will decrease the effect.
D) under-indicate the turn and liquid swirl will increase the effect.

5. Variation in a position is 13W, and True track is 136° . Consider the following statements:
A) The position most likely is located at northern latitudes and on eastern longitudes.
B) The compass track is 149° .
C) Looking north from this position, the magnetic North pole seems to be located to the East of the true north pole.
D) The magnetic track is 149° .

6. Deviation is:
A) an error to be added to compass heading to obtain magnetic heading.
B) an error to be added to magnetic headings.
C) a correction to be added to compass heading to obtain magnetic heading.
D) a correction to be added to magnetic heading to obtain compass heading.

7. An isogonal:
A) is a line running through all positions having the same variation.
B) is a line on the surface of the Earth, running through all positions having the same magnetic latitude.
C) is a line running through all positions having the same magnetic longitude.
D) is a line running through all positions having the same magnetic inclination.

8. Dip:
A) is the angle between the compass needle and magnetic north.
B) is the angle between the vertical and a freely suspended magnet influenced by the earths magnetic field.
C) is the angle between the horizontal and magnetic north.
D) is the angle between the horizontal and a freely suspended magnet influenced by the earths magnetic field.

9. The angle between True North and Magnetic North is called:
A) variation.
B) drift.
C) deviation.
D) compass error.

10. What is the value of magnetic dip at the South Magnetic Pole?
A) 360°
B) 180°
C) 0°
D) 090°

11. Consider the following statements on magnetic variation:
A) The largest values of variation are found along the anti meridians of the Magnetic poles.
B) Variation will never exceed 90° .
C) The variation is east when True North seems to be located west of Magnetic North.
D) Variation will always increase when the total strength of the terrestrial magnetic field increases.

12. The total Magnetic Force of the terrestrial magnetic field:
A) is horizontal in all positions on the surface of the Earth.
B) is strongest at the magnetic poles.
C) will be stronger at higher altitudes because the attenuation is less at high altitudes.
D) is vertical at the magnetic equator.

13. What are isogrivs?
A) Lines of equal variation.
B) Lines of equal magnetic grivation.
C) Lines of equal magnetic dip.
D) Lines of equal deviation.

14. An aircraft is over position HO (55° 30N 060° 15W), where YYR VOR (53° 30N 060° 15W) can be received. The magnetic variation is 31° W at HO and 28° W at YYR. What is the radial from YYR?
A) 208°
B) 332°
C) 031°
D) 028°

15. The horizontal component of the earths magnetic field:
A) is approximately the same at all magnetic latitudes less than 60° .
B) weakens with increasing distance from the nearer magnetic pole.
C) is approximately the same at magnetic latitudes 50° N and 50° S.
D) weakens with increasing distance from the magnetic poles.

16. If variation is West; then:
A) Magnetic North is West of Compass North.
B) Compass North is West of Magnetic North.
C) True North is West of Magnetic North.
D) True North is East of Magnetic North.

17. Which of the following statements concerning earth magnetism is completely correct?
A) An isogonal is a line which connects places of equal dip; the aclinic is the line of zero magnetic dip.
B) An isogonal is a line which connects places with the same magnetic variation; the agonic line is the line of zero magnetic dip.
C) An isogonal is a line which connects places with the same magnetic variation; the aclinic connects places with the same magnetic field strength.
D) An isogonal is a line which connects places with the same magnetic variation; the aclinic is the line of zero magnetic dip.

18. When accelerating on a westerly heading in the northern hemisphere, the compass card of a direct reading magnetic compass will turn:
A) clockwise giving an apparent turn towards the north
B) anti-clockwise giving an apparent turn towards the north
C) anti-clockwise giving an apparent turn towards the south
D) clockwise giving an apparent turn towards the south

19. The value of magnetic variation on a chart changes with time. This is due to:
A) movement of the magnetic poles, causing an increase.
B) increase in the magnetic field, causing an increase.
C) movement of the magnetic poles, which can cause either an increase or a decrease.
D) reduction in the magnetic field, causing a decrease.

20. At a specific location, the value of magnetic variation:
A) depends on the true heading.
B) depends on the type of compass installed.
C) depends on the magnetic heading.
D) varies slowly over time.

21. As you move from a lower to a higher southern magnetic latitude, the characteristics of the terrestrial magnetic field will change:
A) the horizontal component of the field will increase and the inclination will decrease.
B) the inclination will increase and the vertical component of the field will increase.
C) the magnetic lines of force will spread further apart.
D) the magnetic meridian will become more and more vertical.

22. Where is a compass most effective?
A) About midway between the earths magnetic poles.
B) In the region of the magnetic South pole.
C) In the region of the magnetic North pole.
D) On the geographic equator.

23. Given: true track is 348° , drift 17° left, variation 32° W, deviation 4° E. What is the compass heading?
A) 359°
B) 337°
C) 033°
D) 007°

24. When is Magnetic North Pole is East of the True North Pole variation is:
A) – and westerly.
B) + and westerly.
C) + and easterly.
D) – and easterly.

25. A magnetic compass will be most effective at:
A) a position roughly half way between the magnetic poles.
B) the South Magnetic Pole.
C) the North Magnetic Pole.
D) the Equator.

26. A line running through positions where the magnetic and the true meridians are parallel, is called:
A) The magnetic equator.
B) An agonic line.
C) An aclinic line.
D) The zero-variation meridian.

27. What is deviation?
A) The angle between True North and compass North.
B) The angle between True North and magnetic North.
C) The angle between magnetic North and True North.
D) The angle between magnetic North and compass North

28. The directive force is:
A) L
B) H
C) Z
D) V

29. The angular difference between the geographical meridian and the magnetic meridian running through the same position is named:
A) magnetic correction.
B) variation.
C) inclination.
D) deviation.

30. What is the definition of magnetic variation?
A) The angle between True North and Compass North.
B) The angle between the direction indicated by a compass and Magnetic North.
C) The angle between Magnetic Heading and Magnetic North.
D) The angle between Magnetic North and True North.

31. What is the maximum possible value of Dip Angle?
A) 180 deg.
B) 45 deg.
C) 90 deg.
D) 66 deg.

32. Isogonals converge at the:
A) North magnetic pole only.
B) North and South magnetic poles only.
C) Magnetic equator.
D) North and South geographic and magnetic poles.

33. When the Magnetic North Pole is West of the True North Pole variation is:
A) + and easterly.
B) – and westerly.
C) + and westerly.
D) – and easterly.

34. What is the mnemonic relating variation and magnetic heading?
A) Variation West Magnetic Least, Variation east Magnetic Least.
B) Variation West Magnetic Best, Variation east Magnetic Least.
C) Variation West Magnetic Least, Variation east Magnetic Best.
D) Variation West Magnetic Best, Variation east Magnetic Best.

35. Isogonals are lines of equal:
A) pressure.
B) wind velocity.
C) magnetic variation.
D) compass deviation.

36. A simple magnet is surrounded by a magnetic field having the following properties:
A) A small number of the magnetic lines of force leaving one of the poles will pass out through space and will never return to this magnet.
B) The magnetic lines of force are straight lines which will not have the characteristics to bend.
C) The fields direction is from the magnets red pole to the magnets blue pole.
D) The direction of the field is from the magnets blue pole to the magnets red pole.

37. The dip angle in the terrestrial magnetic field is given by the following equation:
A) Dip = T/Z
B) Dip = 12 x T/H
C) Dip = sin-1 (H/T)
D) Dip = cos-1 (H/T)

38. Which of these is a correct statement about the Earths magnetic field?
A) It has no effect on aircraft deviation.
B) The angle of dip is the angle between the vertical and the total magnetic force.
C) It may be temporary, transient, or permanent.
D) It acts as though there is a large blue magnetic pole in Northern Canada.

39. The approximate location of the Magnetic North Pole is:
A) 7300N 10000W.
B) 7400N 05800E.
C) 500 NM north-east of the Bering strait.
D) off the northern coast of Greenland.

40. The magnetic equator is best defined as:
A) an aclinic line.
B) a line where deviation is zero.
C) Latitude 00° 00 N/S.
D) an agonic line.

41. When a magnetized compass needle is freely suspended in the Earths magnetic field, and affected by extraneous magnetic influence, it will align itself with:
A) relative North.
B) compass North.
C) true North
D) magnetic North.

42. Complete the following statement regarding magnetic variation. The charted values of magnetic variation on earth normally change annually due to:
A) an increasing field strength causing numerical values at all locations to increase.
B) a reducing field strength causing numerical values at all locations to decrease.
C) magnetic pole movement causing numerical values at all locations to increase.
D) magnetic pole movement causing numerical values at all locations to increase or decrease.

43. What is the mnemonic relating deviation and compass heading?
A) Deviation West Compass Least, Deviation East Compass Least.
B) Deviation West Compass Best, Deviation East Compass Least.
C) Deviation West Compass Best, Deviation East Compass Best.
D) Deviation West Compass Least, Deviation East Compass Best.

44.A negative (westerly) magnetic variation signifies that:
A) True North is West of Magnetic North.
B) Compass North is West of Magnetic North.
C) True North is East of Magnetic North.
D) Compass North is East of Magnetic North.

45. In a particular position the horizontal and the total strength of the terrestrial magnetic field are the same. This position is:
A) between the geographic and the magnetic pole.
B) at the magnetic equator.
C) at magnetic latitude 45° .
D) at one of the magnetic poles.

46. The angle between True North and Magnetic north is known as:
A) dip.
B) deviation.
C) variation.
D) alignment error.

47. When a magnetized compass needle is freely suspended in the Earths magnetic filed, when free from extraneous magnetic influence, it will align itself with:
A) magnetic North.
B) true North.
C) compass North.
D) relative North.

48. Isogonic lines connect positions that have:
A) the same elevation.
B) the same variation.
C) 0° variation.
D) the same angle of magnetic dip.

49. Isogonal lines converge as follows:
A) at the North and South Magnetic Poles.
B) at the Magnetic equator.
C) at the North Magnetic Pole.
D) at the North and South Magnetic and Geographical Poles.

50. What is the dip angle at the South Magnetic Pole?
A) 64 deg
B) 90 deg
C) 0 deg
D) 180 deg

51. The agonic line:
A) Follows separate paths out of the North polar regions, one currently running through Western Europe and the other through the USA.
B) follows the geographic equator.
C) is midway between the magnetic North and South poles.
D) is the shorter distance between the respective True and Magnetic North and South poles.

52. What is the definition of compass deviation?
A) The angle between the horizontal component of the earths field and the total field which decreases with latitude.
B) The angle between compass north and magnetic north measured in degrees east (-) or west (+) from magnetic north.
C) The angle between compass north and magnetic north measured in degrees east (+) or west (-) from magnetic north.
D) The angle between the horizontal component of the earths field and the total component which increases with latitude.

53. Which of the following statements is correct?
A) The Magnetic Blue Pole is in Northern Canada.
B) The inclination depends on whether the Magnetic Equator is North or South of the Geographic Equator.
C) The maximum value of variation is found on the agonic line.
D) Magnetic variation can be calculated from information given on isoclinals.

54. A line drawn on a chart which joins all points where the value of magnetic variation is zero is called an:
A) aclinic line.
B) agonic line.
C) isotach.
D) isogonal.

55. In a particular position the total strength of the terrestrial magnetic field is 5 nanotesla. The inclination is 55° .
What is the strength of the horizontal component in this position?
A) 1,25 nanotesla.
B) 6,05 nanotesla.
C) 2,87 nanotesla.
D) 4,09 nanotesla.

56. The Earth can be considered as being a magnet with the:
A) red pole near the north pole of the earth and the direction of the magnetic force pointing straight up from the earths surface.
B) red pole near the north pole of the earth and the direction of the magnetic force pointing straight down to the earths surface.
C) blue pole near the north pole of the earth and the direction of the magnetic force pointing straight up from the earths surface.
D) blue pole near the north pole of the earth and the direction of the magnetic force pointing straight down to the earths surface.

57. What causes changes of variation at a specific location?
A) Changes in aircraft magnetism.
B) Annual movement of the magnetic poles.
C) Increasing field strength.
D) Decreasing field strength.

58. The agonic line is:
A) a line of zero magnetic deviation.
B) a line of equal magnetic deviation.
C) a line of zero magnetic variation.
D) a line of equal magnetic variation.

59. An Agonic line is a line that connects:
A) positions that have 0° variation.
B) points of equal magnetic dip.
C) positions that have the same variation.
D) points of equal magnetic horizontal field strength.

60. The value of magnetic variation:
A) is always 0° at the magnetic equator.
B) is never greater than 90° .
C) is a maximum of 180° .
D) varies between maximum values of 45° E and 45° W.

Aircraft magnetism:

61. Deviation on MH 180 is -5 and on MH 000 it is +3. Calculate coefficient C:
A) Coefficient C = -1
B) Coefficient C = +4
C) Coefficient C = -2
D) Coefficient C = +8

62. When an aircraft is moved to a place of lower magnetic latitude?
A) Deviation values will change considerably and irregularly.
B) The deviation values will increase.
C) The deviation values will become more southerly.
D) The deviation values will decrease because the horizontal component of the terrestrial field is becoming stronger.

63. You are in the Northern hemisphere, heading 135 C on a Direct Reading Magnetic Compass. You turn right in a Rate 1 turn for 30 seconds. Do you roll out on an indicated heading of:
A) not possible to determine.
B) equal to 225.
C) less than 225.
D) greater than 225.

64. An aircraft accelerates on a westerly heading in the northern hemisphere. The needle of the direct reading compass will:
A) turn clockwise.
B) turn anticlockwise.
C) not be deflected.
D) turn clockwise or anticlockwise depending on the rate of acceleration.

65. The deviation will change with a change in aircraft heading:
A) Because the undesired magnetic pole then is moved relative to the direction of the Earths magnetic field.
B) Because the relative direction of the magnetic meridian is changed.
C) Because the strength of the undesired hard magnetism is changed.
D) Because the magnetic inclination will change whenever the heading is changed.

66. When should a direct reading compass in an aircraft be swung?
A) After being stored for a long period and frequently moved.
B) After a certain number of landings.
C) After a large permanent change in magnetic latitude.
D) After a large permanent change in magnetic longitude.

67. An aircraft accelerates on a westerly heading in the northern hemisphere. The direct reading compass will:
A) indicate less than 270° .
B) indicate 270° .
C) indicate a turn to north.
D) indicate a turn to south.

68. Compass deviation is defined as the angle between:
A) True North and Compass North.
B) Magnetic North and Compass North.
C) True North and Magnetic North.
D) the horizontal and the total intensity of the earths magnetic field.

69. An aircraft in the Northern Hemisphere accelerates whilst on a westerly heading. The compass needle will indicate:
A) a steady westerly heading.
B) a turn towards North.
C) a turn towards South.
D) a heading which is oscillating about west by a few degrees.

70. Consider the following statements on coefficient A, as used to describe deviation:
A) All 3 answers are correct.
B) coefficient A will normally be calculated after coefficients B and C has been corrected for.
C) coefficient A is the average deviation on all headings.
D) coefficient A may be calculated at any stage during a compass swing.

71. An aircraft is at 50° S 134° E heading 100° M. When the aircraft accelerates the direct reading compass will:
A) be deflected anticlockwise and indicate a turn to port.
B) be deflected clockwise and indicate a turn to starboard.
C) be deflected clockwise and indicate a turn to port.
D) be deflected anticlockwise and indicate a turn to starboard.

72. An aircraft is heading 090° M at 45° S and accelerates. The needle of its direct reading compass will:
A) turn anticlockwise and indicate a turn to north.
B) turn clockwise and indicate a turn to south.
C) turn anticlockwise and indicate a turn to south.
D) turn clockwise and indicate a turn to north.

73. When should a compass swing be carried out on a direct reading compass?
A) Change of magnetic latitude.
B) During pre-flight checks.
C) After landing.
D) Before each flight.

74. Hard iron magnetism in aircraft may be caused by:
A) magnetic qualities of the cargo or baggage.
B) a strike of lightening.
C) steel components, mainly in engines and undercarriage.
D) All 3 answers are correct.

75. In discussing parameters P, Q and R of aircraft hard iron magnetism:
A) +P indicates a red pole in the aircraft nose.
B) All 3 statements are correct.
C) +R indicates a red pole under the compass.
D) -Q indicates a blue pole in the left wing.

76. The deviation of a compass is described as +4. This means that:
A) the deviation may be described as westerly.
B) the compass needle seems to be pointing at a pole located west of the magnetic pole.
C) the compass heading will have a lower number in degrees than the magnetic heading.
D) compass heading will always be different by 4 degrees from true heading.

77. Hard iron magnetism in aircraft:
A) is permanent of nature.
B) will be the same in all aircraft of the same type.
C) is easily compensated for by de-gaussing (de-magnetisation).
D) will change with aircraft heading.

78. A direct reading compass is used. Accelerating an aircraft on heading 090 at South Magnetic Latitude will result in:
A) a stable oscillation of the compass indication around heading 090.
B) an indication of a left turn on the compass.
C) an indication of a right turn on the compass.
D) no change in compass indication.

79. An aircraft has hard iron magnetism only, and this hard iron magnetism is represented by a red pole in relative bearing 070 from the compass. On what heading will the westerly deviation be maximum?
A) Heading 020.
B) Heading 110.
C) Heading 340.
D) Heading 200.

80. An aircraft in the northern hemisphere makes an accurate rate one turn to the right/starboard. If the initial heading was 330° , after 30 seconds of the turn the direct reading magnetic compass should read:
A) more or less than 060° depending on the pendulous suspension used.
B) less than 060° .
C) more than 060° .
D) 060° .

81. In northern hemisphere, during an acceleration in an easterly direction, the magnetic compass will indicate:
A) an increase in heading.
B) an apparent turn to the South.
C) a heading of East.
D) a decrease in heading.

82. Which of the following will probably NOT result in a deviation change on a DRC?
A) Relocating a steel iron construction in the cargo compartment close to the DRC.
B) A Walk-man headset placed close the compass.
C) Letting a passenger in cockpit the jump-seat put his mobile phone next to the DRC.
D) Turning the ADF on in flight.

83. When decelerating on a westerly heading in the Northern hemisphere, the compass card of a direct reading magnetic compass will turn:
A) anti-clockwise giving an apparent turn towards the south.
B) clockwise giving an apparent turn toward the south.
C) anti-clockwise giving an apparent turn towards the north.
D) clockwise giving an apparent turn towards the north.

84. The value of variation:
A) has a maximum value of 45 E or 45 W.
B) cannot exceed 90 deg.
C) is zero at the magnetic equator.
D) has a maximum value of 180 deg.

85. Permanent magnetism in aircraft arises chiefly from:
A) the combined effect of aircraft electrical equipment and the earths magnetic field.
B) hammering, and the effect of the earths magnetic field, whilst under construction.
C) the effect of internal wiring and exposure to electrical storms.
D) exposure to the earths magnetic field during normal operation.

86. The angle between Magnetic North and Compass North is called:
A) compass deviation.
B) alignment error.
C) magnetic variation.
D) compass error.

87. When an aircraft on a westerly heading on the northern hemisphere accelerates, the effect of the acceleration error causes the magnetic compass to:
A) to turn faster than the actual turning rate of the aircraft.
B) indicate a turn towards the north.
C) indicate a turn towards the south.
D) lag behind the turning rate of the aircraft.

88. At the magnetic equator, when accelerating after take off on heading West, a direct reading compass:
A) under reads the heading.
B) indicates the correct heading.
C) over reads the heading.
D) indicates a turn to the south.

89. Which of the following statements is correct concerning the effect of turning errors on a direct reading compass?
A) Turning errors are greatest on east/west headings, and are greatest at high latitudes.
B) Turning errors are greatest on north/south headings, and are least at high latitudes.
C) Turning errors are greatest on north/south headings, and are greatest at high latitudes.
D) Turning errors are greatest on east/west headings, and are least at high latitudes.

90. Deviation applied to magnetic heading gives:
A) compass heading.
B) true heading.
C) magnetic track.
D) magnetic course.

91. You are turning from 330C to 040C in the Northern hemisphere, using timing. You stop the turn at the correct time. Before the direct indicating magnetic compass settles down, does it over-read or under-read, and does the effect of liquid swirl increase or decrease?
A) Under-read; decrease.
B) Under-read; increase.
C) Over-read; decrease.
D) Over-read; increase.

92. A direct reading compass is used at North Magnetic Latitude. Starting a right hand turn from heading 300 will result in:
A) the turn has to be broken off before the compass indicate the desired end heading 080.
B) at first a compass indication of a left hand turn.
C) the compass indication will lag during at least the first 90° of the turn.
D) All 3 answers are correct.

93. When turning right from 330° (C) to 040° (C) in the northern hemisphere, the reading of a direct reading magnetic compass will:
A) over-indicate the turn and liquid swirl will decrease the effect.
B) under-indicate the turn and liquid swirl will decrease the effect.
C) over-indicate the turn and liquid swirl will increase the effect.
D) under-indicate the turn and liquid swirl will increase the effect.

94. In the calculation of deviation, the following headings are recorded: MH CH 358 356 091 087 182 186 273 271
Coefficient A is:
A) -2
B) +1
C) -1
D) +2

95. Given:
True Track =352 deg
Variation=11W
Deviation=- 5
Drift=10 R
What is Heading (C)?
A) 358 C
B) 078 C
C) 346 C
D) 025 C

96. What is the cause of permanent magnetism in an aircraft?
A) The horizontal component of he Earths magnetic field.
B) Flying close to power lines.
C) Hammering during production.
D) The vertical component of the Earths magnetic field.

97. When accelerating on an easterly heading in the Northern hemisphere, the compass card of a direct reading magnetic compass will turn:
A) clockwise giving an apparent turn toward the south.
B) anti-clockwise giving an apparent turn toward the north.
C) anti-clockwise giving an apparent turn toward the south.
D) clockwise giving an apparent turn toward the north.

98. Concerning direct reading magnetic compasses, in the northern hemisphere, it can be said that:
A) on an Easterly heading, a longitudinal acceleration causes an apparent turn to the South.
B) on a Westerly heading, a longitudinal acceleration causes an apparent turn to the South.
C) on a Westerly heading, a longitudinal deceleration causes an apparent turn to the North.
D) on an Easterly heading, a longitudinal acceleration causes an apparent turn to the North.

99. Soft iron magnetism in aircraft:
A) is non-permanent of nature, and cannot be reduced by de-gaussing (de-magnetisation).
B) will not cause any compass deviation.
C) will change at unknown times.
D) is easily compensated for in the compass swing procedure.

Principles direct and remote reading compasses:

100. What is the advantage of the remote indicating compass (slaved gyro compass) over the direct reading magnetic compass?
A) It is not affected by aircraft deviation.
B) It is lighter.
C) It senses the earths magnetic field rather than seeks it, so is more sensitive.
D) It is connected to a source of electrical power and so is more accurate.

101. What is an advantage of a gyro-magnetic compass over a direct reading compass?
A) Turning and acceleration errors are as large but more predictable.
B) There is a significant reduction in lag.
C) There is a significant reduction in turning and acceleration errors.
D) The gyro will always indicate the vertical.

102. In a typical remote reading compass, the gyro is kept aligned with the magnetic meridian by means of:
A) a torque motor
B) heading selector.
C) the Annunciator.
D) the gyro rigidity controller.

103. The sensitivity of a direct reading compass varies:
A) directly with the horizontal component of the earths magnetic field.
B) inversely with the vertical component of the earths magnetic.
C) inversely with both vertical and horizontal components of the earths magnetic field.
D) directly with the vertical component of the earths magnetic field.

104. The directive force acting on a compass needle in an aircraft:
A) is the resultant magnetic force in the horizontal plane in the position where the compass is installed.
B) will be cancelled by the compass compensation system
C) will always pull the north-seeking end down at southern magnetic latitudes and up at northern magnetic latitudes.
D) will be higher at high magnetic latitudes than near the magnetic equator.

105. In still air, you wish to fly a true of 315° . Variation is 4° W. Deviation is 2. What Compass heading should you fly?
A) 313
B) 317
C) 309
D) 321

106. The direct reading magnetic compass is made aperiodic (dead beat) by:
A) using the lowest acceptable viscosity compass liquid.
B) keeping the magnetic assembly mass close to the compass point and by using damping wires.
C) pendulous suspension of the magnetic assembly.
D) using long magnets.

107. A direct reading compass should be swung when:
A) the aircraft has made more than a stated number of landings.
B) the aircraft is stored for a long period and is frequently moved.
C) there is a large change in magnetic longitude.
D) there is a large, and permanent, change in magnetic latitude.

108. Which one of the following is an advantage of a remote reading compass as compared with a standby compass?
A) It is more reliable because it is operated electrically and power is always available from sources within the aircraft.
B) It is lighter than a direct reading compass because it employs, apart from the detector unit, existing aircraft equipment.
C) It senses the magnetic meridian instead of seeking it, increasing compass sensitivity.
D) It eliminates the effect of turning and acceleration errors by pendulously suspending the detector unit.

109. What is the purpose of the Annunciator in a gyromagnetic compass?
A) To indicate when a compass swing should be carried out.
B) To indicate a mechanical failure within the compass.
C) To achieve and indicate synchronisation of the gyro and the magnetic elements of the compass system.
D) To indicate an electrical failure within the compass.

110. Given true track 352° , variation 11° W, deviation -5° and drift 10° S the required compass heading is:
A) 347°
B) 018°
C) 005°
D) 358°

111. If true HDG is 165° and variation -3 what is magnetic heading?
A) Variation is plus therefore East, so magnetic is best, so magnetic is 162° .
B) Variation is minus therefore West, so magnetic is best, so magnetic is 168° .
C) Variation is minus therefore West, so magnetic is least, so magnetic is 162° .
D) Variation is plus therefore East, so magnetic is best, so magnetic is 168° .

112. Which of the following is an occasion for carrying out a compass swing on a Direct Reading Compass?

A) After an aircraft has passed through a severe electrical storm, or has been struck by lightning.
B) After any of the aircraft radio equipment has been changed due to unserviceability.
C) Before an aircraft goes on any flight that involves a large change of magnetic latitude.
D) Whenever an aircraft carries a large freight load regardless of its content.

113. The main advantage of a remote indicating compass over a direct reading compass is that it:

A) senses, rather than seeks, the magnetic meridian.
B) requires less maintenance.
C) is able to magnify the earths magnetic field in order to attain greater accuracy.
D) has less moving parts.

114. Why are the detector units of slaved gyro compasses usually located in the aircraft wingtips?

A) To isolate the detector unit from the aircraft deviation sources.
B) With one detector unit in each wingtip, compass deviations are cancelled out.
C) To reduce turning and acceleration errors.
D) To isolate the detector unit from the Earths magnetic field.

115. If compass HDG is 340° and deviation +3, what is magnetic heading?

A) Deviation is plus therefore East, so compass is best, so magnetic is 337° .
B) Deviation is plus therefore West, so compass is least, so magnetic is 343° .
C) Deviation is plus therefore East, so compass is best, so magnetic is 343° .
D) Deviation is plus therefore East, So compass is least, so magnetic is 343° .

116. A Landing Compass:

A) Is used to establish aircraft magnetic heading during a compass swing.
B) Is painted on the ground at airfields to indicate the direction of the cardinal magnetic headings to observers on the ground or in the air.
C) Is the compass used as reference during landing.
D) Is a compass on which the runway direction for landing may be set. The variation information is printed on the map as isogonals.

117. The Annunciator of a remote indicating compass system is used when:

A) setting the heading pointer.
B) compensating for deviation.
C) synchronising the magnetic and gyro compass elements.
D) setting local magnetic variation.

118. In a remote indicating compass system the amount of deviation caused by aircraft magnetism and electrical circuits may be minimised by:
A) the use of repeater cards.
B) positioning the master unit in the centre of the aircraft.
C) mounting the detector unit in the wingtip.
D) using a vertically mounted gyroscope.

119. In the calculation of deviation, the following headings are recorded: MH CH 358 356 091 087 182 186 273 271
Coefficient B is:
A) +1
B) +2
C) -2
D) -3

120. Coefficient A is corrected for:
A) de-gaussing (de-magnetising) the compass.
B) moving the compass housing around its vertical axis.
C) removing disturbing magnetic material from the close vicinity of the compass.
D) using the compensation magnets.

121. The main reason for mounting the detector unit of a remote reading compass in the wingtip of an aeroplane is:
A) by having detector units on both wingtips, to cancel out the deviation effects caused by the aircraft structure.
B) to ensure that the unit is in the most accessible position on the aircraft for ease of maintenance.
C) to minimise the amount of deviation caused by aircraft magnetism and electrical circuits.
D) to maximise the units exposure to the earth's magnetic field.

122. The sensitivity of a direct reading magnetic compass is:
A) proportional to the horizontal component of the earths magnetic field.
B) inversely proportional to the vertical component of the earths magnetic field.
C) inversely proportional to the horizontal component of the earths magnetic field.
D) inversely proportional to the vertical and horizontal components of the earths magnetic field.

123. The main reason for usually mounting the detector unit of a remote indicating compass in the wingtip of an aeroplane is to:
A) place it in a position where there is no electrical wiring to cause deviation errors.
B) reduce the amount of deviation caused by aircraft magnetism and electrical circuits.
C) facilitate easy maintenance of the unit and increase its exposure to the Earths magnetic field.
D) place it where it will not be subjected to electrical or magnetic interference from the aircraft.

124. The purpose of compass check swing is to:
A) cancel out the effects of the magnetic fields found on board the aeroplane.
B) cancel out the vertical component of the earths magnetic field.
C) measure the angle between Magnetic North and Compass North.
D) cancel out the horizontal component of the earths magnetic field.

125. An aircrafts compass must be swung:
A) after a change of theatre of operations at the same magnetic latitude.
B) if the aircraft has been subjected to hammering.
C) if the aircraft has been in the hangar for a long time and has been moved several times.
D) every maintenance inspection.

Charts

General properties of miscellaneous types of projections:

A direct Mercator graticule is baaed on a projection that is:

A) concentric.
B) conical.
C) spherical.
D) cylindrical.

On a direct Mercator projection, the distance measured between two meridians spaced 5° apart at latitude 60° N is 8cm. The scale of this chart at latitude 60° N approximately:

A) 1 : 3 500 000
B) 1 : 6 000 000
C) 1 : 7 000 000
D) 1 : 4 750 000

On a transverse Mercator chart, the scale is exactly correct along the:

A) meridian of tangency and the parallel of latitude perpendicular to it.
B) equator and parallel of origin.
C) prime meridian and the equator.
D) meridians of tangency.

On a Transverse Mercator chart, scale is exactly correct along the:

A) prime meridian and the equator.
B) meridian of tangency.
C) Equator, parallel of origin and prime vertical.
D) datum meridian and meridian perpendicular to it.

Scale on a Lamberts conformal chart is:

A) constant along a parallel of latitude.
B) constant along a meridian of longitude.
C) varies with latitude and longitude.
D) constant over the whole chart.

An Oblique Mercator projection is used specifically to produce:

A) radio navigational charts in equatorial regions.
B) charts of the great circle route between two points.
C) topographical maps of large east/ west extent.
D) plotting charts in equatorial regions.

On a Transverse Mercator Chart scale is assumed to be constant within:

A) 300 nm of the Parallel of Tangency
B) 200 nm of the Poles
C) 300 nm of the Poles
D) 300 nm of the Central Meridian

Transverse Mercator projections are used for:

A) plotting charts in equatorial areas.
B) radio navigation charts in equatorial areas.
C) maps of large east/west extent in equatorial areas.
D) maps of large north/south extent.

On a Lambert conformal conic chart the quoted scale is correct:

A) along the parallel of origin.
B) along the prime meridian.
C) along the two standard parallels.
D) in the area between the standard parallels.

What is the most common use for an oblique Mercator chart?

A) Maps of equatorial areas only.
B) Selected great circle routes.
C) Polar routes.
D) Topographical maps of the British Isles.

The chart that is generally used for navigation in polar areas is based on a:

A) Stereographical projection.
B) Lambert conformal projection.
C) Direct Mercator projection.
D) Gnomonic projection.

On a Lambert Conformal Conic chart earth convergency is most accurately represented at the:

A) parallel of origin.
B) north and south limits of the chart.
C) Equator.
D) standard parallels.

The two standard parallels of a conical Lambert projection are at N10° 40 and N41° 20. The cone constant of this chart is approximately:

A) 0.66.
B) 0.44.
C) 0.18.
D) 0.90.

The Polar Stereographic projection is:

A) A conical projection.
B) A cylinder projection.
C) A plane projection.
D) A variable cone projection.

The convergence factor of a Lambert conformal conic chart is quoted as 0.78535. At what latitude on the chart is earth convergency correctly represented?

A) 51° 45
B) 52° 05
C) 80° 39
D) 38° 15

What is the value of the convergence factor on a Polar Stereographic chart?

A) 0.0
B) 0.5
C) 0.866
D) 1.0

On a direct Mercator projection, the. distance measured between two meridians spaced 5° apart at latitude 60° N is 8 cm. The scale of this chart at latitude 60° N is approximately:

A) 1 : 7 000 000
B) 1 : 3 500 000
C) 1 : 4 750 000
D) 1 : 6 000 000

On an Oblique Mercator, scale is correct and constant:

A) along the Central Meridian.
B) along the parallel of origin,
C) at the False Equator
D) at the Equator.

The constant of cone of a Lambert conformal conic chart is quoted as 0.3955. At what latitude on the chart is earth convergency correctly represented?

A) 66° 42
B) 68° 25
C) 21° 35
D) 23° 18

On a transverse Mercator chart, with the exception of the Equator, parallels of latitude appear as:

A) parabolas.
B) ellipses.
C) straight lines.
D) hyperbolic lines.

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21. Convergency on a Transverse Mercator chart is correct at:
A) the Parallel of Origin.
B) the Equator and the Poles.
C) the datum meridian and the Equator.
D) the datum meridian only.

On an aeronautical chart it is common that:
A) the chart has best conformality only along one parallel of latitude.
B) the exact meridians are curved lines.
C) isoclines are printed on the chart.
D) the exact scale vary within the chart.

A Mercator chart has a scale at the equator = 1: 3 704 000. What is the scale at latitude 60° S?
A) 1 : 185 200.
B) 1 : 3 208 000.
C) 1 : 7 408 000.
D) 1 : 1 852 000.

A Lambert conformal conic projection, with two standard parallels:
A) the scale is only correct along the standard parallels.
B) shows lines of longitude as parallel straight lines.
C) the scale is only correct at parallel of origin.
D) shows all great circles as straight lines.

At 60° N the scale of a direct Mercator chart is 1 : 3 000 000. What is the scale at the equator?
A) 1 : 1 500 000
B) 1 : 3 500 000
C) 1 : 3 000 000
D) 1 : 6 000 000

In producing chart projections, the following projection surfaces may be used:
A) Cylinder, Sphere, Plane.
B) Plane, Sphere, Cone.
C) Plane, Cylinder, Cone.
D) Parabola, Cone, Plane, Cylinder.

The main use for an Oblique Mercator chart would be:
A) topographical coverage of equatorial regions.
B) route charts for selected great circle routes.
C) for countries with large changes in latitude but small changes in longitude.
D) better topographical coverage of polar regions.

The most likely use for an Oblique Mercator chart is:
A) trans-polar navigation.
B) charts for intercontinental flights following great circle tracks.
C) global depiction of magnetic variation.
D) maps of countries with considerable North/South extent but very little East/West extent.

On a Lamberts chart a straight line track crosses a meridian with a direction of 043° T and a second meridian with a direction of 055° T. If the constant of the cone is 0.75 the difference in longitude between the meridians is:
A) 12°
B) 9°
C) 16°
D) 6°

The standard parallels of a Lamberts conical orthomorphic projection are 07° 40N and 38° 20N. The constant of the cone for this chart is:
A) 0.39
B) 0.92
C) 0.42
D) 0.60

The Earth has been charted using:
A) GD84
B) WGP84
C) GPS84
D) WGS84

The main use of a Transverse Mercator is for:
A) polar Maritime Plotting charts.
B) topographical charts of long thin countries lying North/ South.
C) topographical charts of long thin countries lying East/ West.
D) great Circle route strip maps.

The scale of a chart is given as 1:5,000,000 at 69° 00 N. If the scale of the chart is smaller than 1:5.000.000 at 75° 00 N, the projection being used is:
A) the Polar Stereographic
B) the Mercator
C) the Transverse Mercator
D) the Lamberts

The nominal scale of a Lambert conformal conic chart is the:
A) mean scale between the parallels of the secant cone
B) mean scale between pole and equator
C) scale at the equator
D) scale at the standard parallels

The constant of the cone, on a Lambert chart where the convergence angle between longitudes 010° E and 030° W is 30° , is:
A) 0.50.
B) 0.64.
C) 0.40.
D) 0.75.

Representation of meridians, parallel, great circles & rhumb lines:

On a Lambert conformal conic chart, with two standard parallels , the quoted scale is correct:

A) in the area between the standard parallels
B) along the parallel of origin
C) along the two standard parallels
D) along the prime meridian

An aircraft is at 75° N 140° W steering 330° T. For a grid aligned with the Prime meridian the grid track on a polar stereographic chart will be:

A) 290° .
B) 010° .
C) 110° .
D) 190° .

The scale on a Lambert conformal conic chart:

A) is constant along a parallel of latitude.
B) is constant along a meridian of longitude.
C) varies slightly as a function of latitude and longitude.
D) is constant across the whole map.

Position A is 55N 30W. Position B is 54N 20W. The Great Circle track from A to B, measured at A, is 100T.
What is the Rhumb line bearing from A to B?

A) 104T
B) 090T
C) 100T
D) 284T

Which map projection is described as follows: - Meridians are straight lines - The scale vary with latitude - Most rhumb lines are curved lines:

A) An Equatorial Mercator projection.
B) A Lambert conformal projection.
C) A polar Stereographic projection.
D) A Lambert conformal or a Polar stereographic projection.

On a Lamberts chart, the published scale is correct at:

A) the standard parallels.
B) the Equator.
C) the parallel of origin.
D) the Poles.

On a Lambert conformal conic chart the distance between parallels of latitude spaced the same number of degrees apart:

A) expands between, and reduces outside, the standard parallels.
B) is constant throughout the chart.
C) reduces between, and expands outside, the standard parallels.
D) is constant between, and expands outside, the standard parallels.

You are flying from A to B in the northern hemisphere. Your initial great circle track is 273° T and conversion angle is 6° .
The rhumb line track from A to B is:

A) 267° T
B) 276° T
C) 270° T
D) 279° T

The initial straight track from A(75N 60E) to B(75N 60W) on a Polar Stereographic chart is:

A) 330 deg.
B) 060 deg.
C) 030 deg.
D) 360 deg.

Consider the following statements on the great circle and the rhumb line running through the same two positions:

A) The great circle will in most cases be shorter of the two.
B) The rhumb line will in most cases be located closer to the equator than the great circle.
C) The great circle will in most cases run through an area of higher latitude than the rhumb line.
D) All statements are correct.

The angular difference, on a Lambert conformal conic chart, between the arrival and departure track is equal to:

A) earth convergence.
B) conversion angle.
C) map convergence.
D) difference in longitude.

On a Lambert chart, chart convergency is equal to Earth convergency at:

A) the Poles.
B) the parallel of origin.
C) the standard parallels.
D) the equator.

On a Lamberts conformal conic chart, the distance between parallels of latitude spaced the same number of degrees apart:

A) is constant between, and expands outside, the standard parallels.
B) expands between, and reduces outside, the standard parallels.
C) is constant throughout the chart.
D) reduces between, and expands outside, the standard parallels.

On a Direct Mercator chart at latitude of 45° N, a certain length represents a distance of 90 NM on the earth. The same length on the chart will represent on the earth, at latitude 30° N, a distance of:

A) 110 NM.
B) 73.5 NM.
C) 45 NM.
D) 78 NM.

A straight line track is drawn on a polar stereographic chart from P (80° S 145° E) to Q (80° 112° W). At what longitude will the track reach its highest latitude?

A) 093.5° E
B) 060.5° W
C) 158.5° W
D) 163.5° W

What is the Rhumb line (RL) direction from 45° N 14° 12W to 45° N 12° 48E?

A) 090° (T)
B) 270° (M)
C) 090° (M)
D) 270° (T)

On a Direct Mercator, rhumb lines are:

A) curves convex to the equator.
B) straight lines.
C) curves concave to the equator.
D) ellipses.

On a Lambert chart (standard parallels 37° N and 65° N), with respect to the straight line drawn on the map the between A (N49° W030°) and B (N48° W040°), the:

A) great circle is to the north, the rhumb line is to the south.
B) rhumb line is to the north, the great circle is to the south.
C) great circle and rhumb line are to the south.
D) great circle and rhumb line are to the north.

Consider the following statements on rhumb lines:

A) A rhumb line and a great circle will never have the same true direction for some distance.
B) The true direction of a rhumb line on northern hemisphere will increase in true direction, while on southern hemisphere it will decrease.
C) A rhumb line will never cross a great circle.
D) Most rhumb lines will run as spirals from the one pole to another.

An aircraft flies 448 nm along a parallel of latitude and the longitude changes by 8° 21. What is the latitude:

A) 26° 36 N/S
B) 46° 36 N/S
C) 16° 36 N/S
D) 63° 24 N/S

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21. On a Transverse Mercator chart a straight line is drawn representing 200 nm which is perpendicular to, and originates from, the central meridian. It is a:

A) great circle.
B) small circle.
C) rhumb line.
D) a curve concave to the prime meridian.

On a Lambert conformal chart the scale is correct:

A) In the middle of the chart.
B) At the standard parallels.
C) At the selected parallel (parallel of origin).
D) At the latitude where the convergence on the chart corresponds to the Earth convergence.

On a Lambert conformal chart the distance between two parallels of latitude having a difference of latitude = 2° , is measured to be 112 millimetres. The distance between two meridians, spaced 2° longitude, is, according to the chart 70 NM. What is the scale of the chart, in the middle of the square described?

A) 1 : 1 984 000
B) 1 : 756 000
C) 1 : 1 233 000
D) 1 : 1 056 000

The total length of the 53° N parallels of latitude on a direct Mercator chart is 133 cm. What is the approximate scale of the chart at latitude 30° S?

A) 1 : 25 000 000
B) 1 : 21 000 000
C) 1 : 30 000 000
D) 1 : 18 000 000

On a Direct Mercator chart, great circles are shown as:

A) rhumb lines.
B) curves concave to the nearer pole.
C) straight lines.
D) curves convex to the nearer pole.

On which of the following chart projections is it NOT possible to represent the north or south poles?

A) Direct Mercator.
B) Lamberts conformal.
C) Polar stereographic.
D) Transverse Mercator.

On a Lamberts chart, scale is smallest at:

A) the parallel of origin.
B) the standard parallels.
C) the Poles.
D) the Equator.

What is the convergence factor of a polar stereographic chart?

A) sine(mean latitude).
B) sine(parallel of origin).
C) n = 1.
D) zero.

The Rhumb line distance between A (53° 23N 001° 19W) and B (53° 23N 007° 47W) is:

A) 231.4 nm
B) 231.4 km
C) 462.8 nm
D) 462.8 km

A line is drawn on a Lamberts Conformal chart which follows a parallel of latitude between 007° 20E and 003° 30E and represents 135 nm. The parallel of latitude on which the line is drawn is:

A) 36°
B) 50°
C) 60°
D) 54°

On a Lambert Conformal Conic chart great circles that are not meridians are:

A) curves concave to the pole of projection.
B) straight lines.
C) straight lines within the standard parallels.
D) curves concave to the parallel of origin.

On a Lambert conformal conic chart the convergence of the meridians:

A) is zero throughout the chart.
B) equals earth convergency at the standard parallels.
C) is the same as earth convergency at the parallel of origin.
D) varies as the secant of the latitude.

A Rhumb line is:

A) a line convex to the nearest pole on a Mercator projection.
B) the shortest distance between two points on a Polyconic projection.
C) a line on the surface of the earth cutting all meridians at the same angle.
D) any straight line on a Lambert projection.

On a Direct Mercator chart a great circle will be represented by a:

A) complex curve.
B) curve convex to the equator.
C) straight line.
D) curve concave to the equator.

Which one of the following statements is correct concerning the appearance of great circles, with the exception of meridians, on a Polar Stereographic chart whose tangency is at the pole?

A) They are curves convex to the Pole.
B) The higher the latitude the closer they approximate to a straight line.
C) Any straight line is a great circle.
D) They are complex curves that can be convex and/or concave to the Pole.

On a Lamberts chart, the true appearance of a great circle (other than a meridian) is:

A) straight line within the standard parallels.
B) a curve, concave to the nearer pole.
C) a curve, concave to the parallel of origin.
D) a straight line.

A straight line on a Lambert Conformal Projection chart for normal flight planning purposes:

A) is a Loxodromic line.
B) can only be a parallel of latitude.
C) is a Rhumb line.
D) is approximately a Great Circle.

An aircraft flies a rhumb line track from A (160° E) to B (170° W) at the same latitude in the Northern hemisphere. Its groundspeed is 300 knots and the flight takes three hours. The latitude of the aircraft is:

A) 60° N.
B) 75° N.
C) 30° N.
D) 45° N.

On a Lambert conformal chart the distance between two parallels of latitude having a difference of latitude = 2° , is measured to be 112 millimetres. The distance between two meridians, spaced 2° longitude, is, according to the chart 70 NM. What is the latitude in the centre of the described square?

A) 54°
B) 42°
C) 38°
D) 49°

On a Direct Mercator chart, meridians are:

A) parallel, equally spaced, vertical straight lines.
B) parallel, unequally spaced, vertical straight lines.
C) inclined, equally spaced, straight lines that meet at the nearer pole.
D) inclined, unequally spaced, curved lines that meet at the nearer pole.

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41. Where on a Lamberts chart will a great circle be a perfectly straight line?

A) Meridians of longitude.
B) The equator.
C) Parallels of latitude.
D) All great circles.

Which one of the following describes the appearance of rhumb lines, except meridians, on a Polar Stereographic chart?

A) Ellipses around the Pole.
B) Curves convex to the Pole.
C) Curves concave to the Pole.
D) Straight lines.

Parallels of latitude on a Direct Mercator chart are:

A) parallel straight lines unequally spaced.
B) arcs of concentric circles equally spaced.
C) straight lines converging above the pole.
D) parallel straight lines equally spaced.

The parallels on a Lambert Conformal Conic chart are represented by:

A) hyperbolic lines.
B) parabolic lines.
C) straight lines.
D) arcs of concentric circles.

How does scale change on a normal Mercator chart?

A) Expands directly with the secant of the latitude.
B) Correct on the standard parallels, expands outside them, contracts within them.
C) Expands as the secant2 (1/2 co-latitude).
D) Expands as the secant of the E/W great circle distance.

On a Direct Mercator chart, a rhumb line appears as a:

A) small circle concave to the nearer pole.
B) spiral curve.
C) straight line.
D) curve convex to the nearer pole.

On a Direct Mercator chart at latitude 15° S, a certain length represents a distance of 120 NM on the earth. The same length on the chart will represent on the earth, at latitude 10° N, a distance of:

A) 122.3 NM.
B) 124.2 NM.
C) 117.7 NM.
D) 118.2 NM.

The use of aeronautical charts:

An aircraft is at position A (49° 10S 178° 22W). It flies due North for 2,950 NM and then due West for 382 NM to position B. Where is position B?

A) 81° 40S 171° 50E.
B) 00° 00S171° 50E.
C) 00° 00S 175° 16E.
D) 81° 40S 175° 16E.

Given: An aircraft is flying a track of 255° (M), 2254 UTC, it crosses radial 360° from a VOR station, 2300 UTC, it crosses radial 330° from the same station. At 2300 UTC, the distance between the aircraft and the station is:

A) randomly different than it was at 2254 UTC.
B) the same as it was at 2254 UTC.
C) less than it was at 2254 UTC.
D) greater than it was at 2254 UTC.

A Lambert conformal conic chart has a constant of the cone of 0.75. The initial course of a straight line track drawn on this chart from A (40° N 050° W) to B is 043° (T) at A; course at B is 055° (T). What is the longitude of B?

A) 41° W.
B) 36° W.
C) 34° W.
D) 38° W.

On a chart, 49 nautical miles is represented by 7.0 centimetres. What is the scale?

A) 1 / 700,000
B) 1 / 1,296,400
C) 1 / 1,156,600
D) 1 / 2,015,396

For this question use chart E(LO)1
What is the average track (° T) and distance between WTD NDB (N5211.3 W00705.0) and FOY NDB (N5234.0 W00911.7)?

A) 294° - 80 NM.
B) 277° - 83 NM.
C) 075° - 81 NM.
D) 286° - 81 NM.

For this question use chart E(LO)1
What is the average track (° M) and distance between WTD NDB (N5211.3 W00705.0) and KER NDB (N5210.9 W00931.5)?

A) 278° - 90 NM
B) 098° - 90 NM
C) 090° - 91 NM
D) 270° - 89 NM

A course of 120° (T) is drawn between X (61° 30N) and Y (58° 30N) on a Lambert Conformal conic chart with a scale of 1: 1 000 000 at 60° N. The chart distance between X and Y is:

A) 66.7 cm
B) 33.4 cm
C) 38.5 cm
D) 36.0 cm

For this question use chart E(LO)1
What is the radial and DME distance from CRK VOR/DME (N5150.4 W00829.7) to position N5230 W00750?

A) 024° - 43 NM
B) 023° - 48 NM
C) 039° - 48 NM
D) 017° - 43 NM

Assume a Mercator chart. The distance between positions A and B, located on the same parallel and 10° longitude apart, is 6 cm. The scale at the parallel is 1: 9 260 000. What is the latitude of A and B?

A) 30° N or S.
B) 45° N or S.
C) 0°
D) 60° N or S.

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) radial 143° , CRK VOR (N5150.4 W00829.7) radial 050° . What is the aircraft position?

A) N5200 W00800
B) N5210 W00800
C) N5205 W00805
D) N5155 W00810

An aircraft is at 5530N 03613W, where the variation is 15W. It is tuned to a VOR located at 5330N 03613W, where the variation is 12W. What VOR radial is the aircraft on?

A) 348
B) 012
C) 165
D) 015

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) Birr aerodrome (N5304 W00754) What is the SHA radial and DME distance when overhead Birr aerodrome?

A) 060° - 42 Nm
B) 240° - 41 NM
C) 068° - 41 NM
D) 248° - 42 NM

For this question use chart E(LO)1
What is the radial and DME distance from CON VOR/DME (N5354.8 W00849.1) to position N5330 W00930?

A) 335° - 43 NM.
B) 165° - 27 NM.
C) 233° - 35 NM.
D) 025° - 38 NM.

On a direct Mercator projection, at latitude 45° North, a certain length represents 70 NM. At latitude 30° North, the same length represents approximately:

A) 81 NM
B) 57 NM
C) 86 NM
D) 70 NM

The scale of a Mercator chart is 1:4,000,000 at 56° N. What is the chart length in centimetres between 065° W and 055° W at the equator?

A) 8.9
B) 16.7
C) 6.4
D) 10.9

An aircraft departs a point 0400N 17000W and flies 600 nm South, followed by 600 nm East, then 600 nm North, then 600 nm West. What is its final position?

A) 0400N 17001.8W
B) 0400N 17000W
C) 0600S 17000W
D) 0400N 16958.1W

For this question use chart E(LO)1
CRN VOR (N5318.1 W00856.5) DME 34 NM, SHA VOR (N5243.3 W00853.1) DME 26 NM, Aircraft heading 090° (M), Both DME distances increasing. What is the aircraft position?

A) N5255 W00815
B) N5250 W0030
C) N5310 W00820
D) N5305 W00930

Contour lines on aeronautical maps and charts connect points:

A) having the same longitude.
B) having the same elevation above sea level.
C) of equal latitude.
D) with the same variation.

For this question use chart E(LO)1
What is the radial and DME distance from BEL VOR/DME (N5439.7 W00613.8) to position N5440 W00730?

A) 090° - 46 NM.
B) 098° - 45 NM.
C) 278° - 44 NM.
D) 278° - 10 NM.

Given: Direct Mercator chart with a scale of 1: 200 000 at equator; Chart length from A to B, in the vicinity of the equator, 11 cm. What is the approximate distance from A to B?

A) 21 NM
B) 22 NM
C) 14 NM
D) 12 NM

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21. The distance measured between two points on a navigation map is 42 mm (millimetres). The scale of the chart is 1:1 600 000. The actual distance between these two point is approximately:

A) 67.20 NM.
B) 3.69 NM.
C) 370.00 NM.
D) 36.30 NM.

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) radial 129° , CRK VOR (N5150.4 W00829.7) radial 047° . What is the aircraft position?

A) N5210 W00750
B) N5205 W00755
C) N5215 W00755
D) N5220 W00750

A chart distance represents 120nm at 15° S on a direct Mercator chart. What earth distance does the same chart distance represent at 10° N?

A) 122.3 nm
B) 118.3 nm
C) 124.2 nm
D) 117.7 nm

For this question use chart E(LO)1
SHA VOR N5243.3 W00853.1 CON VOR N5354.8 W00849.1 Aircraft position N5330 W00800 Which of the following lists two radials that are applicable to the aircraft position?

A) SHA 213° CON 310°
B) SHA 042° CON 138°
C) SHA 221° CON 318°
D) SHA 033° CON 130°

For this question use chart E(LO)1
What is the radial and DME distance from SHA VOR/DME (N5243.3 W00853.1) to position N5220 W00810?

A) 212° - 26 NM.
B) 132° - 36 NM.
C) 139° - 35 NM.
D) 129° - 46 NM.

A polar Stereographic chart is overlaid with a grid aligned with the Greenwich Anti-Meridian. An aircraft sets off from 80° S 020° E on a grid track of 340° (G). Determine the initial great circle track (° T).

A) 160° (T)
B) 140° (T)
C) 320° (T)
D) 180° (T)

For this question use chart E(LO)1
What is the average track (° T) and distance between CON VOR (N5354.8 W00849.1) and BEL VOR (N5439.7 W00613.8)?

A) 113° - 97 NM.
B) 063° - 101 NM.
C) 071° - 100 NM.
D) 293° - 98 NM.

Refer to chart E(LO)1.
At position 5211N 00931W, which of the following denotes all the symbols?

A) Civil airport, ILS, NDB.
B) Civil airport, VOR, ILS.
C) Military airport, ILS, NDB.
D) Military airport, VOR, ILS.

A straight line drawn on a chart measures 4.63 cm and represents 150 NM. The chart scale is:

A) 1 : 6 000 000.
B) 1 : 5 000 000.
C) 1 : 1 000 000.
D) 1 : 3 000 000.

Which of the following statements is correct for a Mercator projection?

A) Scale is correct at the equator and expands as the cosine of the latitude.
B) Scale is correct at the equator and expands as the secant of the latitude.
C) Convergency is correct at the equator and increases as the secant of the latitude.
D) Chart convergency is correct at the equator and increases as the sine of the latitude.

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) radial 223° , CRK VOR (N5150.4 W00829.7) radial 322° . What is the aircraft position?

A) N5230 W00910
B) N5210 W00910
C) N5210 W00930
D) N5220 W00920

For this question use chart E(LO)1
CRK VOR/DME (N5150.4 W00829.7) Kerry aerodrome (N5210.9 W00931.4) What is the CRK radial and DME distance when overhead Kerry aerodrome?

A) 127° - 45 NM
B) 307° - 43 NM
C) 119° - 44 NM
D) 299° - 42 NM

Your position is 5833N 17400W. You fly exactly 6 nm eastwards. What is your new position?

A) 5833N 17348.5W
B) 5833N 17411.5W
C) 5833N 17340W
D) 5833N 17355W

A straight line on a chart 4.89 cm long represents 185 NM. The scale of this chart is approximately:

A) 1 : 5 000 000
B) 1 : 7 000 000
C) 1 : 6 000 000
D) 1 : 3 500 000

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) radial 120° , CRK VOR (N5150.4 W00829.7) radial 033° . What is the aircraft position?

A) N5230 W00800
B) N5225 W00805
C) N5240 W00750
D) N5220 W00750

For this question use chart E(LO)1
What feature is shown on the chart at position N5351 W00917?

A) Castlebar aerodrome.
B) Connemara aerodrome.
C) Brittas Bay aerodrome.
D) Connaught aerodrome.

On a Polar Stereographic chart, the initial great circle course from A 70° N 060° W to B 70° N 060° E is approximately:

A) 330° (T)
B) 210° (T)
C) 150° (T)
D) 030° (T)

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) Connemara aerodrome (N5314 W00928) What is the SHA radial and DME distance when overhead Connemara aerodrome?

A) 146° - 38 NM.
B) 154° - 38 NM.
C) 326° - 37 NM.
D) 333° - 37 NM.

For this question use chart E(LO)1
What is the average track (° T) and distance between SLG NDB (N5416.7 W00836.0) and CFN NDB (N5502.6 W00820.4)?

A) 348° - 46 NM.
B) 011° - 47 NM.
C) 191° - 45 NM.
D) 020° - 46 NM.

(Refer to Jeppesen Manual chart E(LO)1)
An aircraft is cleared to route direct from the Shanwick Oceanic CTA at 56N 010W to BEL (N54° 39.7 W006° 13.8).
If the TAS is 450 kts and the wind is given as Northerly at 70 kts the mean magnetic track to fly will be:

A) 115°
B) 122°
C) 130°
D) 107°

Given: Chart scale is 1: 1 850 000. The chart distance between two points is 4 centimetres. Earth distance is approximately:

A) 100 NM
B) 4 NM
C) 74 NM
D) 40 NM

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41. For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) DME 50 NM, CRK VOR (N5150.4 W00829.7) DME 41 NM, Aircraft heading 270° (M), Both DME distances increasing. What is the aircraft position?

A) N5215 W00745
B) N5215 W00940
C) N5200 W00935
D) N5235 W00750

For this question use chart AT(H/L)1
What are the initial true course and distance between positions N5800 W01300 and N6600 E00200?

A) 029° - 570 NM
B) 036° - 638 NM
C) 032° - 470 NM
D) 042° - 635 NM

For this question use chart E(LO)1
What is the radial and DME distance from BEL VOR/DME (N5439.7 W00613.8) to position N5410 W00710?

A) 333° - 36 NM
B) 223° - 36 NM
C) 236° - 44 NM
D) 320° - 44 NM

Given: Waypoint 1 is 60S 030W, waypoint 2 is 60S 020W. What will be the approximate latitude on the display unit of an inertial navigation system at longitude 025W?

A) 6011S
B) 6006S
C) 6000S
D) 5949S

For this question use chart E(LO)1
What is the radial and DME distance from SHA VOR/DME (N5243.3 W00853.1) to position N5310 W00830?

A) 070° - 58 NM.
B) 019° - 31 NM.
C) 035° - 30 NM.
D) 207° - 31 NM.

Given: Magnetic heading 311° Drift angle 10° left Relative bearing of NDB 270° What is the magnetic bearing of the NDB measured from the aircraft?

A) 180° .
B) 208° .
C) 211° .
D) 221° .

Two positions plotted on a polar stereographic chart, A (80° N 000°) and B (70° N 102° W) are joined by a straight line whose highest latitude is reached at 035° W. At point B, the true course is:

A) 023°
B) 247°
C) 203°
D) 305°

An aircraft flies a great circle track from 56° N 070° W to 62° N 110° E. The total distance travelled is:

A) 1788 NM.
B) 2040 NM.
C) 3720 NM.
D) 5420 NM.

For this question use chart E(LO)1
What is the radial and DME distance from SHA VOR/DME (N5243.3 W00853.1) to position N5210 W00920?

A) 198° - 37 NM
B) 354° - 34 NM
C) 214° - 37 NM
D) 346° - 34 NM

A Lambert conformal conic chart has a constant of the cone of 0.80. A straight line course drawn on this chart from A (53° N 004° W) to B is 080° at A; course at B is 092° (T). What is the longitude of B?

A) 019° E.
B) 009° 36E.
C) 011° E.
D) 008° E.

On a Lambert Conformal chart the distance between meridians 5° apart along latitude 37° North is 9 cm. The scale of the chart at that parallel approximates:

A) 1 : 2 000 000.
B) 1 : 6 000 000.
C) 1 : 5 000 000.
D) 1 : 3 750 000.

In a navigation chart a distance of 49 NM is equal to 7 cm. The scale of the chart is approximately:

A) 1 : 1 300 000.
B) 1 : 700 000.
C) 1 : 130 000.
D) 1 : 7 000 000.

For this question use chart E(LO)1
What is the average track (° M) and distance between CRN NDB (N5318.1 W00856.5) and BEL VOR (N5439.7 W00613.8)?

A) 237° - 130 NM.
B) 229° - 125 NM
C) 089° - 95 NM.
D) 057° - 126 NM.

A straight line is drawn on a North Polar Stereographic chart joining Point A (7000N 06000W) to Point B (7000N 06000E). What is the initial track direction (going eastwards) of the line at A?

A) 330 T
B) 120 T
C) 030 T
D) 090 T

A chart has the scale 1: 1 000 000. From A to B on the chart measures 1.5 inches (one inch equals 2.54 centimetres), the distance from A to B in NM is:

A) 20.6.
B) 44.5
C) 54.2
D) 38.1

For this question use chart E(LO)1
What is the average track (° M) and distance between KER NDB (N5210.9 W00931.5) and CRN NDB (N5318.1 W00856.5)?

A) 017° - 70 NM
B) 025° - 70 NM
C) 197° - 71 NM
D) 205° - 71 NM

Position A is at 70S 030W, position B is 70S 060E. What is the Great Circle track of B from A, measured at A?

A) 132T
B) 228T
C) 090T
D) 048T

Given that:

- A is N55 E/W 000
- B is N54 E 010

If the true great circle track from A to B is 100T, what is the true Rhumb Line track at A?

A) 096
B) 107
C) 104
D) 100

For this question use chart E(LO)1
What is the average track and distance between BAL VOR (N5318.0 W00626.9) and CRN NDB (N5318.1 W00856.5)?

A) 270° - 90 NM.
B) 268° - 91 NM.
C) 272° - 89 NM.
D) 278° - 89 NM.

61. On a chart, the distance along a meridian between latitudes 45° N and 46° N is 6 cm. The scale of the chart is approximately:
A) 1 : 1 850 000.
B) 1 : 1 000 000.
C) 1 : 185 000.
D) 1 : 18 500 000.

For this question use chart E(LO)1
Which of the following lists all the aeronautical chart symbols shown at position N5318.0 W00626.9?
A) Military airport: VOR: DME.
B) VOR: DME: danger area.
C) Civil airport: VOR: DME.
D) Military airport: VOR: NDB.

For this question use chart E(LO)1
What is the radial and DME distance from SHA VOR/DME (N5243.3 W00853.1) to position N5300 W00940?
A) 057° - 27 NM
B) 324° - 17 NM
C) 309° - 33 NM
D) 293° - 33 NM

For this question use chart AT(H/L)1
What are the average magnetic course and distance between position N6000 W02000 and Sumburg VOR (N5955 W 00115)?
A) 091° - 480 NM
B) 091° - 562 NM
C) 105° - 480 NM
D) 105° - 562 NM

At latitude 60° N the scale of a Mercator projection is 1: 5 000 000. The length on the chart between C N60° E008° and D N60° W008° is:
A) 19.2 cm.
B) 35.6 cm.
C) 17.8 cm.
D) 16.2 cm.

For this question use chart E(LO)1
Which of the following lists all the aeronautical chart symbols shown at position N5150.4 W00829.7?
A) VOR: DME: NDB: ILS.
B) VOR: DME: NDB: compulsory reporting point.
C) Civil airport: VOR: non-compulsory reporting point.
D) Civil airport: VOR: DME: compulsory reporting point.

For this question use chart E(LO)1
What feature is shown on the chart at position N5212 W00612?
A) TUSKAR ROCK LT.H. NDB
B) WTD NDB
C) Clonbullogue aerodrome
D) KERRY/Farranfore aerodrome

For this question use chart AT(H/L)1
An aircraft on radial 315° at a range of 150 NM from MYGGENES NDB (N6206 W00732) is at position?
A) N6020 W00405
B) N6040 W00320
C) N6345 W01125
D) N6320 W01205

For this question use chart E(LO)1
Which of the following lists all the aeronautical chart symbols shown at position N5318.1 W00856.5?
A) Civil airport: VOR: DME: non-compulsory reporting point.
B) Civil airport: NDB: DME: non-compulsory reporting point.
C) VOR: DME: NDB: compulsory reporting point.
D) VOR: DME: NDB: compulsory reporting point.

On a Mercator chart, the scale:
A) is constant throughout the chart.
B) varies as 1/2 cosine of the co-latitude.
C) varies as 1/cosine of latitude (1/cosine= secant).
D) varies as the sine of the latitude.

On a particular Direct Mercator wall chart, the 180W to 180E parallel of latitude at 53N is 133 cm long. What is the scale of the chart at 30S?
A) 1: 21 000 000
B) 1: 18 000 000
C) 1: 27 000 000
D) 1: 3 000 000

For this question use chart E(LO)1
What is the radial and DME distance from CON VOR/DME (N5354.8 W00849.1) to position N5430 W00900?
A) 049° - 45 NM
B) 358° - 36 NM
C) 214° - 26 NM
D) 169° - 35 NM

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) radial 205° , CRK VOR (N5150.4 W00829.7) radial 317° . What is the aircraft position?
A) N5205 W00915
B) N5210 W00910
C) N5118 W00913
D) N5215 W00917

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) radial 120° /35 NM. What is the aircraft position?
A) N5250 W00950
B) N5225 W00805
C) N5300 W00945
D) N5230 W00800

Route A (44° N 026° E) to B (46° N 024° E) forms an angle of 35° with longitude 026° E. Average magnetic variation between A and B is 3° E. What is the average magnetic course from A to B?
A) 038° .
B) 328° .
C) 032° .
D) 322° .

For this question use chart E(LO)1
What is the average track (° M) and distance between WTD NDB (N5211.3 W00705.0) and BAL VOR (N5318.0 W00626.9)?
A) 206° - 71 NM.
B) 198° - 72 NM.
C) 018° - 153 NM.
D) 026° - 71 NM.

Approximately how many nautical miles correspond to 12 cm on a map with a scale of 1: 2 000 000?
A) 130
B) 150
C) 43
D) 329

For this question use chart E(LO)1
What is the average track (° T) and distance between CRN NDB (N5318.1 W00856.5) and EKN NDB (N5423.6 W00738.7)?
A) 035° - 80 NM
B) 042° - 83 NM
C) 036° - 81 NM
D) 044° - 82 NM

For this question use chart E(LO)1
SHA VOR N5243.3 W00853.1 CON VOR N5354.8 W00849.1 Aircraft position N5320 W00950
Which of the following lists two radials that are applicable to the aircraft position?
A) SHA 325° CON 235°
B) SHA 137° CON 046°
C) SHA 317° CON 226°
D) SHA 145° CON 055°

For this question use chart E(LO)1
What is the radial and DME distance from BEL VOR/DME (N5439.7 W00613.8) to position N5500 W00700?
A) 296° - 65 NM
B) 315° - 34 NM
C) 222° - 48 NM
D) 126° - 33 NM

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81. On a chart with a scale of 1:600000 the distance from A to B is 42mm. What is the distance on the Earth from A to B?
A) 25.2 km
B) 157 SM
C) 136 NM
D) 252 km

Waypoint 1 is 60N 30W. Waypoint 2 is 60N 20W. The aircraft autopilot is coupled to the INS steer. What is the latitude on passing 25 W?
A) 6005N.
B) 6011N.
C) 5949M.
D) 6032N.

An aircraft at latitude 0220N tracks 180T for 685 kilometres. What is its latitude at the end of the flight?
A) 0850S
B) 0350S
C) 0250S
D) 0210S

For this question use chart E(LO)1
What is the radial and DME distance from CRK VOR/DME (N5150.4 W00829.7) to position N5140 W00730?
A) 106° - 38 NM
B) 104° - 76 NM
C) 293° - 39 NM
D) 113° - 38 NM

For this question use chart E(LO)1
SHA VOR N5243.3 W00853.1 CRK VOR N5150.4 W00829.7 Aircraft position N5220 W00910
Which of the following lists two radials that are applicable to the aircraft position?
A) SHA 033° CRK 149°
B) SHA 212° CRK 328°
C) SHA 025° CRK 141°
D) SHA 205° CRK 321°

For this question use chart E(LO)1
What feature is shown on the chart at position N5417 W01005?
A) Belmullet aerodrome.
B) Clonbullogue aerodrome.
C) Carnmore aerodrome.
D) EAGLE ISLAND LT.H. NDB.

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) radial 232° /32 NM. What is the aircraft position?
A) N5305 W00815
B) N5228 W00935
C) N5220 W00930
D) N5303 W00810

For this question use chart E(LO)1
CRN VOR (N5318.1 W00856.5) DME 18 NM, SHA VOR (N5243.3 W00853.1) DME 30 NM, Aircraft heading 270° (M), Both DME distances decreasing. What is the aircraft position?
A) N5310 W00830
B) N5307 W00923
C) N5252 W00923
D) N5355 W00825

For this question use chart E(LO)1
What is the average track (° T) and distance between WTD NDB (N5211.3 W00705.0) and SLG NDB (N5416.7 W00836.0)?
A) 344° - 139 NM.
B) 156° - 136 NM.
C) 164° - 138 NM.
D) 336° - 137 NM.

At 0020 UTC an aircraft is crossing the 310° radial at 40 NM of a VOR/DME station. At 0035 UTC the radial is 040° and DME distance is 40 NM. Magnetic variation is zero. The true track and ground speed are:
A) 080° - 226 kt.
B) 085° - 226 kt.
C) 088° - 232 kt.
D) 090° - 232 kt.

For this question use chart E(LO)1
What is the radial and DME distance from CON VOR/DME (N5354.8 W00849.1) to position N5400 W00800?
A) 088° - 29 NM
B) 094° - 64 NM
C) 260° - 30 NM
D) 320° - 8 NM

An aircraft starts at position 0410S 17822W and heads true north for 2950 nm, then turns 90 degrees left, and maintains a rhumb line track for 314 kilometres. What is its final position?
A) 4500N 17422W
B) 5500N 17738E
C) 5500N 17422W
D) 4500N 17738E

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) radial 165° /36 NM. What is the aircraft position?
A) N5208 W00840
B) N5210 W00830
C) N5317 W00908
D) N5315 W00915

For this question use chart E(LO)1
What feature is shown on the chart at position N5211 W00931?
A) KERRY/Farranfore aerodrome.
B) Connemara aerodrome.
C) Waterford NDB.
D) Punchestown aerodrome.

For this question use chart E(LO)1
What feature is shown on the chart at position N5311 W00637?
A) Punchestown aerodrome.
B) Connemara aerodrome.
C) KERRY/Farranfore aerodrome.
D) Clonbullogue aerodrome.

For this question use chart E(LO)1
Which of the following lists all the aeronautical chart symbols shown at position N5416.7 W00836.0?
A) civil airport: VOR: DME: non-compulsory reporting point.
B) VOR: DME: NDB: compulsory reporting point.
C) VOR: DME: NDB: non-compulsory reporting point.
D) civil airport: NDB: DME: compulsory reporting point.

An aircraft at position 6000N 00522W flies 165 km due East. What is the new position?
A) 6000N 00820E
B) 6000N 00108E
C) 6000N 00108W
D) 6000N 00224W

On a Mercator chart 47 cm represents 247 nm at 35° S. The scale of the chart is:
A) 1:1 200 000 at the Equator.
B) 1:1 200 000 at 35° S.
C) 1:1 700 000 at the Equator.
D) 1:970 000 at 47° S.

The total length of the 53° N parallel of latitude on a direct Mercator chart is 133 cm. What is the approximate scale of the chart at latitude 30° S?
A) 1 : 30 000 000
B) 1 : 21 000 000
C) 1 : 25 000 000
D) 1 : 18 000 000

For this question use chart E(LO)1
What is the radial and DME distance from CRK VOR/DME (N5150.4 W00829.7) to position N5220 W00810?
A) 030° - 33 NM
B) 014° - 33 NM
C) 220° - 40 NM
D) 048° - 40 NM

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101. (For this question use chart E(LO)1)
What is the radial and DME distance from CON VOR/DME (N5354.8 W00849.1) to position N5340 W00820)?
A) 240° - 24 NM.
B) 311° - 22 NM.
C) 119° - 42 NM.
D) 140° - 23 NM.

What is the chart distance between longitudes 179° E and 175° W on a direct Mercator chart with a scale of 1: 5 000 000 at the equator?
A) 133 mm
B) 167 mm
C) 72 mm
D) 106 mm

The rhumb line distance of the 53° N parallel of latitude is measured on a Mercator chart as 133 cm; what is the scale of the chart at 30° S?
A) 1:13 000 000
B) 1:25 000 000
C) 1:30 000 000
D) 1:17 000 000

On a Mercator chart, at latitude 60° N, the distance measured between W002° and E008° is 20 cm. The scale of this chart at latitude 60° N is approximately:
A) 1 : 5 560 000
B) 1 : 556 000
C) 1 : 2 780 000
D) 1 : 278 000

For this question use chart E(LO)1
What is the average track (° T) and distance between BAL VOR (N5318.0 W00626.9) and CFN NDB (N5502.6 W00820.4)?
A) 327° - 124 NM
B) 320° - 127 NM
C) 335° - 128 NM
D) 325° - 126 NM

A straight line is plotted on a Lamberts chart from A (35° N 145° W) to B (47° N 125° W) which measures 044° T at A. What is the rhumb line track from A to B measured at B?
A) 051°
B) 037°
C) 217°
D) 231°

At 47° North the chart distance between meridians 10° apart is 5 inches. The scale of the chart at 47° North approximates:
A) 1 : 2 500 000.
B) 1 : 8 000 000.
C) 1 : 6 000 000.
D) 1 : 3 000 000

The chart distance between meridians 10° apart at latitude 65° North is 3.75 inches. The chart scale at this latitude approximates:
A) 1 : 3 000 000.
B) 1 : 5 000 000.
C) 1 : 2 500 000.
D) 1 : 6 000 000.

5 hours 20 minutes and 20 seconds hours time difference is equivalent to which change of longitude:
A) 79° 10
B) 81° 30
C) 80° 05
D) 78° 15

For this question use chart E(LO)1
SHA VOR/DME (N5243.3 W00853.1) radial 025° /49 NM. What is the aircraft position?
A) N5330 W00830
B) N5200 W0925
C) N5328 W00820
D) N5155 W00915

The following waypoints are entered into an inertial navigation system (INS)

- WPT 1: 60N 30W
- WPT 2: 60N 20W
- WPT 3: 60N 10W

The inertial navigation is connected to the automatic pilot on the route WP1 - WP2 - WP3. The track change on passing WPT2:
A) a 4 deg decrease.
B) zero.
C) a 9 deg decrease.
D) a 9 deg increase.

You fly from 49N to 58N along the 180 E/W meridian. What is the distance in kilometres?
A) 540 km.
B) 1000 km.
C) 804 km.
D) 1222 km.

For this question use chart E(LO)1
Which of the following lists all the aeronautical chart symbols shown at position N5211 W00705?
A) civil airport: ILS.
B) civil airport: NDB.
C) NDB: ILS.
D) VOR: NDB.

For this question use chart E(LO)1
SHA VOR N5243.3 W00853.1 CRK VOR N5150.4 W00829.7 Aircraft position N5230 W00820 Which of the following lists two radials that are applicable to the aircraft position?
A) SHA 312° CRK 197°
B) SHA 131° CRK 017°
C) SHA 304° CRK 189°
D) SHA 124° CRK 009°

For this question use chart AT(H/L)1
What are the average magnetic course and distance between INGO VOR (N6350 W01640) and Sumburg VOR (N5955 W 00115)?
A) 117° - 494 NM
B) 131° - 494 NM
C) 118° - 440 NM
D) 130° - 440 NM

For this question use chart E(LO)1
CON VOR/DME (N5354.8 W00849.1) Castlebar aerodrome (N5351 W00917) What is the CON radial and DME distance when overhead Castlebar aerodrome?
A) 077° - 18 NM
B) 265° - 17 NM
C) 257° - 17 NM
D) 086° - 18 NM

For this question use chart E(LO)1
SHA VOR (N5243.3 W00853.1) DME 41 NM, CRK VOR (N5150.4 W00829.7) DME 30 NM, Aircraft heading 270° (M), Both DME distances decreasing. What is the aircraft position?
A) N5215 W00915.
B) N5225 W00810.
C) N5205 W00915.
D) N5215 W00805.

On a polar stereographic projection chart showing the South Pole, a straight line joins position A (70° S 065° E) to position B (70° S 025° W). The true course on departure from position A is approximately:
A) 135° .
B) 250° .
C) 225° .
D) 315° .

Dead reckoning navigation (DR)
Basic Dead reckoning

Track = 090 (T), TAS = 460 knots, W/V = 360 (T) / 100, Variation = 10 E, Deviation = -2.
What is compass heading and groundspeed?
A) 079 470 knots
B) 068 460 knots
C) 069 450 knots
D) 070 455 knots

Given: Position A is N00° E100° , Position B is 240° (T), 200 NM from A. What is the position of B?
A) S01° 40 E101° 40
B) N01° 40 E101° 40
C) S01° 40 E097° 07
D) N01° 40 E097° 07

Given: True course A to B = 250° Distance A to B = 315 NM TAS = 450 kt. W/V = 200° /60kt. ETD A = 0650 UTC.
What is the ETA at B?
A) 0716 UTC.
B) 0736 UTC.
C) 0730 UTC.
D) 0810 UTC.

An aircraft is climbing at a constant CAS in ISA conditions. What will be the effect on TAS and Mach No?
A) Both increase.
B) Both decrease.
C) TAS increases and Mach No decreases.
D) TAS decreases and Mach No increases.

Using mental navigation, the local speed of sound may be found using the following equation:
A) LSS = 644 + 1,2 TATc
B) LSS = 735 - 1,05 TATc
C) LSS = TAS + Mach number x TATc
D) LSS = 333 x TAS/Mach number

You are flying from A (50N 10W) to B (58N 02E). If Inital Great Circle track is 047° T what is Final Great Circle track?
A) 29°
B) 52°
C) 43°
D) 57°

The rhumb-line distance between points A (60° 00N 002° 30E) and B (60° 00N 007° 30W) is:
A) 450 NM.
B) 600 NM.
C) 150 NM.
D) 300 NM

An aircraft leaves 0° N/S 45° W and flies due south for 10 hours at a speed of 540 kts. What is its position as a true bearing from the south pole?
A) 60° T
B) 000° T
C) 30° T
D) 45° T

An aircraft has a TAS of 300 knots and is over a stretch of water between 2 airfields 500 nm apart. If the wind component is 60 knots head, what is the distance from the first airfield to the critical point?

A) 300 nm.
B) 200 nm.
C) 250 nm.
D) 280 nm.

Given the following: True track: 192° Magnetic variation: 7° E Drift angle: 5° left What is the magnetic heading required to maintain the given track?

A) 194°
B) 204°
C) 190°
D) 180°

The ICAO definition of ETA is the:

A) estimated time en route.
B) actual time of arrival at a point or fix.
C) estimated time of arrival at an en-route point or fix.
D) estimated time of arrival at destination.

An aircraft in the northern hemisphere is making an accurate rate one turn to the right. If the initial heading was 135° , after 30 seconds the direct reading magnetic compass should read:

A) less than 225°
B) 225°
C) more or less than 225° depending on the pendulous suspension used
D) more than 225°

What is the time required to travel along the parallel of latitude 60° N between meridians 010° E and 030° W at a groundspeed of 480 kt?

A) 1 HR 15 MIN.
B) 1 HR 45 MIN.
C) 2 HR 30 MIN.
D) 5 HR 00 MIN.

What is the distance in kilometres from 49° S 180° E/W to 58° S 180º E/W?

A) 540 km.
B) 1000 km.
C) 1112 km.
D) 621 km.

Heading is 156° T, TAS is 320 knots, W/V is 130° /45. What is your true track?

A) 104
B) 152
C) 160
D) 222

An aircraft departs from position A (04° 10 S 178° 22 W) and flies northward following the meridian for 2950 NM. It then flies westward along the parallel of latitude for 382 NM to position B. The coordinates of position B are?

A) 53° 20 N 172° 38 E
B) 45° 00 N 172° 38 E
C) 53° 20 N 169° 22 W
D) 45° 00 N 169° 22 W

An aircraft passes position A (60° 00N 120° 00W) on route to position B (60° 00N 140° 30W). What is the great circle track on departure from A?

A) 279° .
B) 288° .
C) 261° .
D) 270° .

You are flying from A(30S 20E) to B (30S 20E). What is the RL track from A to B?

A) 290° (T)
B) 300° (T)
C) 270° (T)
D) 250° (T)

An aircraft leaves 0° N/S 45° W and flies due south for 10 hours at a speed of 540 kts. What is its position?

A) South pole.
B) 30° S
C) 45° S
D) North pole.

You are flying from A(30S 20E) to B (30S 20E). What is the initial GC track?

A) 270° (T)
B) 290° (T)
C) 300° (T)
D) 260° (T)

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21. Construct the triangle of velocities on a piece of paper, showing the following data: TH 305, TAS 135 Kt, W/V 230/40, Period of time from 1130 to 1145. What is the GS in this period of time?

A) 135 Kt
B) 145 Kt
C) 97 Kt
D) 130 Kt

The rhumb line track between position A (45° 00N, 010° 00W) and position B (48° 30N, 015° 00W) is approximately:

A) 300
B) 330
C) 315
D) 345

What is the ISA temperature value at FL 330?

A) -66° C
B) -50° C
C) -56° C
D) -81° C

Given the following: Magnetic heading: 060° Magnetic variation: 8° W Drift angle: 4° right What is the true track?

A) 064°
B) 072°
C) 056°
D) 048°

The distance between the parallels of latitude 17º 23S and 23º 59N is:
A) 636 NM.
B) 4122 NM.
C) 2482 NM.
D) 2473 NM.

Given: Position A N60 W020, Position B N60 W021, Position C N59 W020. What are, respectively, the distances from A to B and from A to C?
A) 30 NM and 60 NM.
B) 60 NM and 52 NM.
C) 60 NM and 30 NM.
D) 52 NM and 60 NM.

Construct the triangle of velocities on a piece of paper, showing the following data: TH 305, TAS 135 Kt, W/V 230/40, Period of time from 1130 to 1145. What is the track in this period of time?
A) 322°
B) 290°
C) 316°
D) 310°

A is at 5500N 15100W and B at 4500 N 16253W What is the departure?
A) 584 NM
B) 546 NM
C) 409 NM
D) 458 NM

What is the ratio between the litre and the US gallon?
A) 1 US-GAL equals 3.78 litres.
B) 1 US-GAL equals 4.55 litres.
C) 1 litre equals 3.78 US-GAL
D) 1 litre equals 4.55 US-GAL.

5 HR 20 MIN 20 SEC corresponds to a longitude difference of:
A) 80° 05
B) 78° 45
C) 75° 00
D) 81° 10

What is the longitude of a position 6 NM to the east of 58° 42N 094° 00W?
A) 093° 53.1W.
B) 093° 48.5W.
C) 093° 54.0W.
D) 094° 12.0W.

Given: A is N55° 000° B is N54° E010° The average true course of the great circle is 100° . The true course of the rhumbline at point A is:
A) 096°
B) 104°
C) 107°
D) 100°

Use of Navigational computer:

The equivalent of 70 m/sec is approximately:
A) 35 kt
B) 145 kt
C) 136 kt
D) 210 kt

Given: GS = 105 kt. Distance from A to B = 103 NM. What is the time from A to B?
A) 01 HR 01 MIN.
B) 00 HR 59 MIN.
C) 00 HR 57 MIN.
D) 00 HR 58 MIN.

Given: True course from A to B = 090° , TAS = 460 kt, W/V = 360/100kt, Average variation = 10° E, Deviation = - 2° . Calculate the compass heading and GS?
A) 068° - 460 kt
B) 078° - 450 kt
C) 069° - 448 kt
D) 070° - 453 kt

An aircraft is flying TAS 180 knots and tracking 090° T. The W/V is 045/50. How far can the aircraft fly out from its base and return within 1 hour?
A) 74 nm
B) 85 nm
C) 102 nm
D) 111 nm

Groundspeed is 540 knots. 72 nm to go. What is time to go?
A) 9 mins.
B) 12 mins
C) 18 mins.
D) 8 mins.

Airfield elevation is 1000 feet. The QNH is 988. Use 27 feet per millibar. What is pressure altitude?
A) 675
B) 825
C) 325
D) 1675

Flying from A to B, distance 3,016 nm, TAS 480 kts, there is a headwind of 90 kts and when flying from B to A there is a tailwind of 75 kts. If the aircraft leaves A at 1320 UTC what is the ETA at the equal time point?
A) 1752 UTC
B) 1707 UTC
C) 1656 UTC
D) 1825 UTC

Given: Course 040° (T), TAS is 120 kt, Wind speed 30 kt. Maximum drift angle will be obtained for a wind direction of:
A) 120°
B) 130°
C) 145°
D) 115°

G/S = 240 knots, Distance to go = 500 nm. What is time to go?
A) 2 h 12 m.
B) 29 minutes.
C) 2 h 05 m.
D) 20 minutes.

265 US-GAL equals? (Specific gravity 0.80)
A) 803 kg.
B) 940 kg.
C) 862 kg.
D) 895 kg.

TAS 285 kts, groundspeed 236 kts, distance-to-go 354 nm. What is the time-to-go?
A) 48.0 minutes.
B) 90.0 minutes.
C) 40.0 minutes.
D) 74.5 minutes.

How long will it take to fly 5 NM at a groundspeed of 269 Kt?
A) 0 MIN 34 SEC
B) 2 MIN 30 SEC.
C) 1 MIN 07 SEC.
D) 1 MIN 55 SEC.

An aircraft travels 100 statute miles in 20 minutes. How long will it take to travel 215 NM?
A) 37.4 mins.
B) 49.5 mins.
C) 72.1 mins.
D) 43.0 mins.

With a groundspeed of 135 kts and a distance to go of 433 NM the time to go is?
A) 3 hrs 12 mins.
B) 19 mins.
C) 3 hrs 21 mins.
D) 31 mins.

On a particular take-off, you can accept up to 10 knots tailwind. The runway QDM is 047, the variation is 17E and the ATIS gives the wind direction as 210. What is the maximum wind strength you can accept?
A) 18 knots
B) 8 knots
C) 11 knots
D) 4 knots

Convert 70 metres/sec into knots:
A) 146 knots.
B) 36 knots.
C) 54 knots.
D) 136 knots.

Pressure Altitude is 27,000 feet, OAT = -35C, Mach No = 0.45, W/V = 270/85, Track = 200T.
What is drift and groundspeed?
A) 17R / 287 knots.
B) 15R / 310 knots.
C) 17L / 228 knots.
D) 18L / 252 knots.

Given: IAS 120 kts, FL80, COAT +20° . The TAS is:
A) 102 kts.
B) 132 kts.
C) 120 kts.
D) 141 kts.

An aircraft is landing on runway 23 (QDM 227°), surface wind 180° /30 kts from ATIS; variation is 13° E. The cross wind component on landing is:
A) 26 kts.
B) 15 kts.
C) 20 kts.
D) 23 kts.

An aircraft travels 100 statute miles in 20 MIN, how long does it take to travel 215 NM?
A) 100 MIN.
B) 90 MIN.
C) 80 MIN.
D) 50 MIN.

---

21. The wind velocity is 359/25. An aircraft is heading 180 at a TAS of 198 knots. (All directions are True). What is its track and groundspeed?
A) 179 220
B) 180 220
C) 179 223
D) 180 223

Indicated Outside Air Temperature -30° C, TAS 438 kts. What is the Corrected Outside Air temperature (COAT)?
A) -50° C.
B) -20° C.
C) -30° C.
D) -40° C.

The relative bearing to a beacon is 270° R. Three minutes later, at a groundspeed of 180 knots, it has changed to 225° R. What was the distance of the closest point of approach of the aircraft to the beacon?
A) 9 nm.
B) 45 nm.
C) 18 nm.
D) 3 nm.

Given:
TAS = 225 kt, HDG (° T) - 123°
W/V - 090/60kt
Calculate the Track (° T) and GS?
A) 123 - 180 kt
B) 120 - 190 kt
C) 134 - 188 kt
D) 134 - 178 kt

Fuel flow per HR is 22 US-GAL, total fuel on board is 83 IMP GAL. What is the endurance?
A) 2 HR 15 MIN
B) 3 HR 53 MIN
C) 3 HR 12 MIN
D) 4 HR 32 MIN

Given: True track 180° Drift 8° R Compass heading 195° Deviation -2° Calculate the variation?
A) 5° W.
B) 21° W.
C) 25° W.
D) 9° W.

You leave A to fly to B, 475 nm away, at 1000 hours. Your ETA at B is 1130. At 1040, you are 190 nm from A. What groundspeed is required to arrive on time at B?
A) 360 knots.
B) 330 knots.
C) 317 knots.
D) 342 knots.

Given: GS = 135 kt. Distance from A to B = 433 NM. What is the time from A to B?
A) 3 HR 25 MIN.
B) 3 HR 20 MIN.
C) 3 HR 12 MIN.
D) 3 HR 19 MIN.

An aeroplane flying at 180 kts TAS on a track of 090° . The wind is 045° /50 kts. The distance the aeroplane can fly out and return in one hour is:
A) 88 NM.
B) 56 NM.
C) 85 NM.
D) 176 NM.

If the wind is 010° T/100kts, variation is 30° W, the TAS is 400 kts and the aircraft is flying a heading of 100° M. What is the track and groundspeed?
A) 084° ; 360 kts
B) 084° ; 350 kts
C) 086° ; 340 kts
D) 057° ; 340 kts

Given: Required course 045° (M); Variation is 15° E; W/V is 190° (T)/30 kt; CAS is 120 kt at FL 55 in standard atmosphere. What are the heading (° M) and GS?
A) 052° and 154 kt
B) 036° and 151 kt
C) 056° and 137 kt
D) 055° and 147 kt

TAS 330 kts, heading 300° M, drift 6° P, groundspeed 270 kts, variation 30° E. The true wind velocity is:
A) 355° T/70kts.
B) 325° T/65kts.
C) 340° T/90kts.
D) 010° T/80kts.

730 FT/MIN equals:
A) 5.2 m/sec
B) 2.2 m/sec
C) 1.6 m/sec
D) 3.7 m/sec

Given: GS = 345 kt. Distance from A to B = 3560 NM. What is the time from A to B?
A) 10 HR 05 MIN.
B) 11 HR 02 MIN.
C) 11 HR 00 MIN.
D) 10 HR 19 MIN.

Given:
FL250
OAT -15 ° C
TAS 250 kt
Calculate the Mach No.?
A) 0.39
B) 0.44
C) 0.40
D) 0.42

Given:
True HDG = 145° TAS - 240 kt
Track (T) - 150° GS - 210 kt
Calculate the W/V?
A) 180/35kt
B) 360/35kt
C) 115/35kt
D) 295/35kt

If the true track from A to B is 090° , TAS is 460 kts, wind velocity is 360° /100kts, variation is 10° E and deviation is -2° ; calculate the compass heading and groundspeed.
A) 070° and 453 kts.
B) 068° and 460 kts.
C) 078° and 450 kts.
D) 069° and 448 kts.

Given:
TAS = 170 kt HDG(T) = 100°
W/V - 350/30kt Calculate the Track (° T) and GS?
A) 098 - 178 kt
B) 091 - 183 kt
C) 109 - 182 kt
D) 103 - 178 kt

Given: GS = 236 kt. Distance from A to B = 354 NM What is the time from A to B?
A) 1 HR 40 MIN.
B) 1 HR 10 MIN.
C) 1 HR 30 MIN.
D) 1 HR 09 MIN.

If TAS is 472 kts, heading is 005° T, wind is 110° /50 kts the drift and groundspeed will be:
A) 7° Stbd and 491 kts.
B) 6° Stbd and 487 kts.
C) 6° Port and 487 kts.
D) 7° Port and 491 kts.

41. Given: True course 300° drift 8° R variation 10° W deviation -4° Calculate the compass heading?
A) 278°
B) 306°
C) 322°
D) 294°

An aircraft has a groundspeed of 510 kts and a True Air Speed of 440 kts. If the distance from A to B is 43 NM, the time in minutes from A to B will be:
A) 6
B) 7
C) 4
D) 5

At 1000 hours an aircraft is on the 310 radial from a VOR/DME, at 10 nautical miles range. At 1010 the radial and range are 040/10 nm. What is the aircrafts track and groundspeed?
A) 085 / 85 knots.
B) 080 / 85 knots.
C) 085 / 90 knots.
D) 080 / 80 knots.

Given: GS = 435 kt. Distance from A to B = 1920 NM. What is the time from A to B?
A) 4 HR 10 MIN
B) 4 HR 25 MIN
C) 3 HR 25 MIN
D) 3 HR 26 MIN

Given: GS = 122 kt. Distance from A to B = 985 NM. What is the time from A to B?
A) 8 HR 10 MIN.
B) 8 HR 04 MIN.
C) 7 HR 48 MIN.
D) 7 HR 49 MIN.

If the TAS is 90 kts, the aircraft heading is 044° T (variation is 20° W), drift is 8° S and groundspeed is 70 kts, the wind is:
A) 004° T/30kts.
B) 038° T/23kts.
C) 018° T/23kts.
D) 025° T/30kts.

Given: GS = 480 kt. Distance from A to B = 5360 NM. What is the time from A to B?
A) 11 HR 06 MIN.
B) 11 HR 15 MIN.
C) 11 HR 07 MIN.
D) 11 HR 10 MIN.

An airfield has two runways, 05/23 and 30/12. The surface wind is given as 250° /30. The headwind component on 23 and the crosswind component on runway 30 will be:
A) 28 kts headwind and 23 kts crosswind.
B) 28 kts headwind and 19 kts crosswind.
C) 10 kts headwind and 23 kts crosswind.
D) 10 kts headwind and 19 kts crosswind.

Required course 045T, W/V = 190 /30, FL = 55 at ISA, Variation = 15E. CAS = 120 knots. What is mag heading and G/S?

A) 037M 113.
B) 052M 154.
C) 067M 154.
D) 037M 154.

How many NM would an aircraft travel in 1 MIN 45 SEC if GS is 135 kt?

A) 2.36
B) 3.94
C) 39.0
D) 3.25

Given: GS = 510 kt. Distance A to B = 43 NM What is the time (MIN) from A to B?

A) 5
B) 7
C) 6
D) 4

Given: true track 070° variation 30° W deviation +1° drift 10° R Calculate the compass heading?

A) 089°
B) 091°
C) 100°
D) 101°

An aircraft travels 2.4 statute miles in 47 seconds. What is its groundspeed?

A) 209 kt.
B) 160 kt.
C) 131 kt.
D) 183 kt.

An aircraft is at ROK (N55° 58.1 E025° 36.1) at 2057 UTC, FL180, heading 017° M, TAS 120 kts. Routing via UH133 it is at LBN (N56° 46.4 E026° 21.1) at 2120 UTC. What mean wind velocity has affected the aircraft?

A) 160° T/ 30 kts.
B) 180° T/ 25 kts.
C) 220° T/ 30 kts.
D) 230° T/ 25 kts.

You are flying 090° C heading. Deviation is 2° W and Variation is 12 E. Your TAS is 160 knots. You are flying the 070 radial outbound from a VOR and you have gone 14 nm in 6 minutes. What is the W/V?

A) 055° T / 25.
B) 158° T / 51.
C) 340° T / 25.
D) 060° T / 50.

Given: GS = 120 kt. Distance from A to B = 84 NM. What is the time from A to B?

A) 00 HR 44 MIN.
B) 00 HR 43 MIN.
C) 00 HR 42 MIN.
D) 00 HR 45 MIN.

The tank capacity of an aircraft is 310 US GAL. Fuel specific gravity is 0,78 kg/litre. The tanks are now 3/4 full. You want to refuel so that total fuel will be 850 kg. How much fuel will you have to refuel? Answer in pounds.

A) 410 LB.
B) 320 LB.
C) 360 LB.
D) 164 LB.

Given: IAS 120 kt, FL 80, OAT +20° C. What is the TAS?
A) 132 kt.
B) 102 kt.
C) 141 kt.
D) 120 kt.

Given: GS = 95 kt. Distance from A to B = 480 NM. What is the time from A to B?
A) 5 HR 03 MIN
B) 4 HR 59 MIN
C) 5 HR 08 MIN
D) 5 HR 00 MIN

Given: true track 352° variation 11° W deviation is -5° drift 10° R. Calculate the compass heading?
A) 358°
B) 346°
C) 018°
D) 025°

---

61. Given:
TAS - 230 kt HDG (T) - 250°
W/V m 205/10kt
Calculate the drift and GS?
A) 1L - 225 kt
B) 2L - 224 kt
C) 2R - 223 kt
D) 1R - 221 kt

The triangle of velocities; methods of solutions:

For a landing on runway 23 (227° magnetic) surface W/V reported by the ATIS is 180/30kt. VAR is 13° E.
Calculate the cross wind component?

A) 15 kt
B) 26 kt
C) 22 kt
D) 20 kt

Given:
Magnetic heading = 255° VAR = 40° W
GS = 375 kt W/V = 235° (T) / 120 kt
Calculate the drift angle?

A) 16° right.
B) 7° left.
C) 9° left.
D) 7° right.

Given:
TAS = 250 kt HDG (T) = 029°
W/V = 035/45kt Calculate the drift and GS?

A) 1L - 265 kt.
B) 1L - 205 kt.
C) 1R - 205 kt.
D) 1R - 295 kt.

Given:
Runway direction 305° (M)
Surface W/V 260° (M)/30 kt
Calculate the cross-wind component?

A) 24 kt.
B) 18 kt.
C) 27 kt.
D) 21 kt.

Given:
TAS = 140 kt HDG (T) = 005°
W/V = 265/25kt
Calculate the drift and GS?

A) 11R - 140 kt.
B) 11R - 142 kt.
C) 9R - 140 kt.
D) 10R - 146 kt.

Given:
TAS = 155 kt Track (T) = 305°
W/V = 160/18kt
Calculate the HDG (° T) and GS?

A) 305 - 169 kt
B) 309 - 141 kt
C) 301 - 169 kt
D) 309 - 170 kt

The reported surface wind from the control tower is 240° /35 kt.
Runway 30 (300°). What is cross-wind component?
A) 24 kt
B) 30 kt
C) 27 kt
D) 21 kt

Given:
TAS = 235 kt, HDG (T) = 076° W/V = 040/40kt
Calculate the drift angle and GS?
A) 7L - 269 kt.
B) 5L - 255 kt.
C) 7R - 204 kt.
D) 5R - 207 kt.

Given:
True HDG = 054° TAS = 450 kt
Track (T) = 059° GS = 416 kt
Calculate the W/V?
A) 010/55kt
B) 005/50kt
C) 010/45kt
D) 010/50kt

Given:
TAS = 290 kt
True HDG = 171°
W/V = 310° (T)/30kt
Calculate the drift angle and GS?
A) 4° L - 310 kt
B) 4° L - 314 kt
C) 4° R - 310 kt
D) 4° R - 314 k

Given:
TAS = 485 kt True HDG = 226°
W/V = 110° (T)/95kt. Calculate the drift angle and GS?
A) 7° R - 531 kt.
B) 9° R - 433 kt.
C) 9° R - 533 kt.
D) 8° L - 435 kt.

Given:
TAS = 132 kt HDG (T) = 053°
W/V = 205/15kt Calculate the Track (° T) and GS?
A) 057 - 144 kt.
B) 050 - 145 kt.
C) 051 - 144 kt.
D) 052 - 143 kt.

Given:
TAS = 135 kt HDG (° T) = 278
W/V = 140/20kt Calculate the Track (° T) and GS?
A) 282 - 148 kt
B) 279 - 152 kt
C) 283 - 150 kt
D) 275 - 150 kt

Given:
TAS = 125 kt
True HDG = 355°
W/V = 320° (T)/30kt.
Calculate the true track and GS?
A) 348 - 102 kt
B) 005 - 102 kt
C) 002 - 98 kt
D) 345 - 100 kt

Given:
TAS = 205 kt HDG (T) = 180°
W/V = 240/25kt Calculate the drift and GS?
A) 4L - 195 kt.
B) 7L - 192 kt.
C) 3L - 190 kt.
D) 6L - 194 kt.

Given
TAS = 370 kt True HDG = 181°
W/V = 095° (T)/35kt Calculate the true track and GS?
A) 192 - 370 kt
B) 176 - 370 kt
C) 186 - 370 kt
D) 189 - 370 kt

Given:
TAS = 130 kt Track (T) = 003°
W/V = 190/40kt Calculate the HDG (° T) and GS?
A) 359 - 166 kt
B) 357 - 168 kt
C) 001 - 170 kt
D) 002 - 173 kt

Given: TAS = 132 kt, True HDG = 257° W/V = 095° (T)/35kt. Calculate the drift angle and GS?
A) 2° R - 166 kt.
B) 3° L - 166 kt.
C) 4° L - 167 kt.
D) 4° R - 165 kt.

Given:
TAS = 220 kt Magnetic course = 212°
W/V 160° (M)/ 50kt Calculate the GS?
A) 246 kt
B) 186 kt
C) 250 kt
D) 290 kt

Given:
True HDG = 307° TAS = 230 kt
Track (T) = 313° GS = 210 kt
Calculate the W/V?
A) 255/25kt.
B) 260/30kt.
C) 265/30kt.
D) 257/35kt.

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21. Given: Maximum allowable crosswind component is 20 kt. Runway 06, RWY QDM 063° (M). Wind direction 100° (M) Calculate the maximum allowable windspeed?
A) 26 kt.
B) 25 kt.
C) 31 kt.
D) 33 kt.

Given:
TAS = 472 kt True HDG = 005°
W/V = 110° (T)/50kt Calculate the drift angle and GS?
A) 7° R - 491 kt.
B) 7° L - 491 kt.
C) 7° R - 487 kt.
D) 6° L - 487 kt.

Given:
True HDG = 206° TAS = 140 kt
Track (T) = 207° GS = 135 kt Calculate the W/V?
A) 000/05kt
B) 180/05kt
C) 000/10kt
D) 180/10kt

Given:
True Heading = 090° TAS = 180 kt
GS = 180 kt Drift 5° right Calculate the W/V?
A) 360° / 15 kt
B) 180° / 15 kt
C) 010° / 15 kt
D) 190° / 15 kt

Given:
TAS = 190 kt True HDG = 085°
W/V = 110° (T)/50kt. Calculate the drift angle and GS?
A) 4° L - 168 kt.
B) 8° L - 146 kt.
C) 7° L - 156 kt.
D) 4° L - 145 kt.

Given:
TAS = 270 kt True HDG = 145°
Actual wind = 205° (T)/30kt
Calculate the drift angle and GS?
A) 6° L - 256 kt.
B) 6° R - 259 kt.
C) 6° R - 251 kt.
D) 8° R - 261 kt.

Given: For take-off an aircraft requires a headwind component of at least 10 kt and has a cross-wind limitation of 35 kt. The angle between the wind direction and the runway is 60° , Calculate the minimum and maximum allowable wind speeds?
A) 20 kt and 40 kt.
B) 18 kt and 50 kt.
C) 12 kt and 38 kt.
D) 15 kt and 43 kt.

Given:
TAS = 155 kt HDG (T) = 216°
W/V = 090/60kt Calculate the Track (° T) and GS?
A) 231 - 196 kt
B) 224 - 175 kt
C) 226 - 186 kt
D) 222 - 181 kt

Given:
TAS = 375 kt True HDG = 124°
W/V = 130° (T)/55kt. Calculate the true track and GS?
A) 126 - 320 kt
B) 123 - 320 kt
C) 125 - 318 kt
D) 125 - 322 kt

Given:
TAS = 440 kt HDG (T) = 349°
W/V = 040/40kt Calculate the drift and GS?
A) 6L - 395 kt
B) 2L - 420 kt
C) 5L - 385 kt
D) 4L - 415 kt

Given:
Course required = 085° (T) Forecast W/V 030/100kt
TAS = 470 kt Distance = 265 NM
Calculate the true HDG and flight time?
A) 076° , 34 MIN.
B) 075° , 39 MIN.
C) 095° , 31 MIN.
D) 096° , 29 MIN.

Given:
TAS = 480 kt HDG (° T) = 040°
W/V = 090/60kt Calculate the Track (° T) and GS?
A) 034 - 445 kt
B) 036 - 435 kt
C) 032 - 425 kt
D) 028 - 415 kt

An aeroplane is flying at TAS 180 kt on a track of 090° . The W/V is 045° / 50kt. How far can the aeroplane fly out from its base and return in one hour?
A) 176 NM
B) 85 NM
C) 56 NM
D) 88 NM

Given:
True Heading = 180° TAS = 500 kt
W/V 225° / 100 kt Calculate the GS?
A) 600 kt.
B) 450 kt.
C) 535 kt.
D) 435 kt.

Given:
True HDG = 133° TAS = 225 kt
Track (T) = 144° GS = 206 kt
Calculate the W/V?
A) 070/40kt.
B) 070/45kt.
C) 075/45kt.
D) 075/50kt.

Given:
True heading = 310° TAS = 200 kt
GS = 176 kt Drift angle 7° right.
Calculate the W/V?
A) 270° / 33 kt
B) 090° / 33 kt
C) 180° / 33 kt
D) 360° / 33 kt

Given:
TAS = 198 kt HDG (° T) = 180
W/V = 359/25. Calculate the Track(° T) and GS?
A) 179 - 220 kt.
B) 181 - 180 kt.
C) 180 - 223 kt.
D) 180 - 183 kt.

Given:
True HDG = 002° TAS = 130 kt
Track (T) = 353° GS = 132 kt
Calculate the W/V?
A) 095/20kt.
B) 093/25kt.
C) 088/20kt.
D) 088/15kt.

Given:
FL120 OAT is ISA standard CAS is 200 kt
Track is 222° (M) Heading is 215° (M)
Variation is 15° W. Time to fly 105 NM is 21 MIN. What is the W/V?
A) 050° (T) / 70 kt.
B) 055° (T) / 105 kt .
C) 040° (T) / 105 kt.
D) 065° (T) / 70 kt.

Given:
True HDG = 035° TAS = 245 kt Track (T) = 046°
GS = 220 kt Calculate the W/V?
A) 335/45kt
B) 335/55kt
C) 340/50kt
D) 340/45kt

---

41. Given:
Runway direction 230° (T)
Surface W/V 280° (T)/40 kt.
Calculate the effective cross-wind component?
A) 26 kt.
B) 21 kt.
C) 36 kt.
D) 31 kt.

Given:
TAS = 95 kt HDG (T) = 075°
W/V = 310/20kt Calculate the drift and GS?
A) 9R - 108 kt.
B) 10L - 104 kt.
C) 8R - 104 kt.
D) 9L - 105 kt.

An aircraft is following a true track of 048° at a constant TAS of 210 kt. The wind velocity is 350° / 30 kt. The GS and drift angle are:
A) 192 kt, 7° left.
B) 192 kt, 7° right.
C) 225 kt, 7° left.
D) 200 kt, 3.5° right.

How long will it take to travel 284 nm at a speed of 526 KPH?
A) 1,9 h
B) 1 h
C) 1,6 h
D) 45 min

The following information is displayed on an Inertial Navigation System: GS 520 kt, True HDG 090° , Drift angle 5° right, TAS 480 kt. SAT (static air temperature) -51° C. The W/V being experienced is:
A) 225° / 60 kt
B) 320° / 60 kt
C) 325° / 60 kt
D) 220° / 60 kt

Given:
TAS = 227 kt Track (T) = 316°
W/V = 205/15kt Calculate the HDG (° T) and GS?
A) 311 - 230 kt.
B) 310 - 233 kt.
C) 312 - 232 kt.
D) 313 - 235 kt.

Given:
TAS = 190 kt HDG (T) = 355°
W/V = 165/25kt Calculate the drift and GS?
A) 1R - 165 kt.
B) 1L - 225 kt.
C) 1L - 215 kt.
D) 1R - 175 kt.

Given: Magnetic track = 075° HDG = 066° (M)
VAR = 11° E TAS = 275 kt
Aircraft flies 48 NM in 10 MIN. Calculate the true W/V ° ?
A) 320° /50 kt
B) 180° /45 kt
C) 210° /15 kt
D) 340° /45 kt

For a given track the: Wind component = 45 kt Drift angle = 15° left TAS = 240 kt What is the wind component on the reverse track?
A) -53 kt
B) -65 kt
C) -37 kt
D) -45 kt

Given: M 0.80 OAT -50° C FL 330
GS 490 kt VAR 20° W Magnetic heading 140°
Drift is 11° Right Calculate the true W/V?
A) 025° /47 kt
B) 200° /95 kt
C) 020° /95 kt
D) 025° /45 kt

Given: TAS = 200 kt, Track (T) = 110° , W/V = 015/40kt. Calculate the HDG (° T) and GS?
A) 121 - 207 kt
B) 097 - 201 kt
C) 099 - 199 kt
D) 121 - 199 kt

Determine the W/V by using the multi-drift method (multiple drift W/V) when the following observations have been made while:
TAS = 187 Kt
MH = 015 : Drift 7R
MH = 075 : Drift 8R
MH = 177 : Drift 3L
A) W/V 328M/29
B) W/V 320M/18
C) W/V 310M/41
D) W/V 296M/36

Given: TAS = 140 kt True HDG = 302°
W/V = 045° (T)/45kt Calculate the drift angle and GS?
A) 18° R - 146 kt
B) 9° R - 143 kt
C) 16° L - 156 kt
D) 9° L - 146 kt

Given: TAS = 270 kt Track (T) = 260°
W/V = 275/30kt Calculate the HDG (° T) and GS?
A) 262 - 241 kt
B) 264 - 237 kt
C) 262 - 237 kt
D) 264 - 241 kt

Given: TAS = 270 kt True HDG = 270°
Actual wind 205° (T)/30kt Calculate the drift angle and GS?
A) 6R - 251kt
B) 6L - 256kt
C) 8R - 259kt
D) 6R - 259kt

Given: TAS = 470 kt True HDG = 317°
W/V = 045° (T)/45kt Calculate the drift angle and GS
A) 5° L - 470 kt
B) 5° R - 475 kt
C) 5° L - 475 kt
D) 3° R - 470 kt

Given: Runway direction 083° (M)
Surface W/V 035/35kt. Calculate the effective headwind component?
A) 27 kt.
B) 31 kt.
C) 24 kt.
D) 34 kt.

If it takes 132,4 mins to travel 840 nm, what is your speed in kmh?
A) 290 kmh
B) 966 kmh
C) 705 kmh
D) 120 kmh

TAS 160 kts, groundspeed 135 kts, distance-to-go 433 NM. What is the time-to-go?
A) 192 minutes.
B) 162 minutes.
C) 19 minutes.
D) 23 minutes.

Given: Runway direction 210° (M)
Surface W/V 230° (M)/30kt Calculate the cross-wind component?
A) 13 kt
B) 10 kt
C) 16 kt
D) 19 kt

---

61. Given: True HDG = 233° TAS = 480 kt
Track (T) = 240° GS = 523 kt
Calculate the W/V?
A) 105/75kt
B) 110/75kt
C) 110/80kt
D) 115/70kt

Given: True Heading = 090° TAS = 200 kt
W/V = 220° / 30 kt Calculate the GS?
A) 230 kt.
B) 220 kt.
C) 180 kt.
D) 200 kt.

Given: TAS = 485 kt HDG (T) = 168°
W/V = 130/75kt Calculate the Track (° T) and GS?
A) 174 - 428 kt.
B) 173 - 424 kt.
C) 175 - 432 kt.
D) 175 - 420 kt.

Given: Compass Heading 090° Deviation 2° W
Variation 12° E TAS 160 kt
Whilst maintaining a radial 070° from a VOR station, the aircraft flies a ground distance of 14 NM in 6 MIN. What is the W/V ° (T)?
A) 160° /50 kt.
B) 340° /25 kt.
C) 155° /25 kt.
D) 340° /98 kt.

An aircraft is on final approach to runway 32R (322°); The wind velocity reported by the tower is 350° /20 kt. TAS on approach is 95 kt. In order to maintain the centre line, the aircrafts heading (° M) should be:
A) 326°
B) 316°
C) 322°
D) 328°

Given: TAS = 465 kt HDG (T) = 124°
W/V = 170/80kt Calculate the drift and GS?
A) 4L - 400 kt
B) 8L - 415 kt
C) 6L - 400 kt
D) 3L - 415 kt

Given: Maximum allowable tailwind component for landing 10 kt. Planned runway 05 (047° magnetic). The direction of the surface wind reported by ATIS 210° . Variation is 17° E. Calculate the maximum allowable windspeed that can be accepted without exceeding the tailwind limit?
A) 15 kt.
B) 8 kt.
C) 11 kt.
D) 18 kt.

Given: Magnetic track = 315º HDG = 301 º (M)
VAR = 5º W TAS = 225 kt
The aircraft flies 50 NM in 12 MIN.
Calculate the W/V(° T)?
A) 195 º /63 kt
B) 355 º /15 kt
C) 195 º /61 kt
D) 190 º /63 kt

Given: Magnetic track = 210° Magnetic HDG = 215°
VAR = 15° E TAS = 360 kt
Aircraft flies 64 NM in 12 MIN. Calculate the true W/V?
A) 265° /50 kt.
B) 195° /50 kt.
C) 235° /50 kt.
D) 300° /30 kt.

Given: TAS = 90 kt HDG (T) = 355°
W/V = 120/20kt Calculate the Track (° T) and GS?
A) 359 - 102 kt.
B) 006 - 95 kt.
C) 358 - 101 kt.
D) 346 - 102 kt.

Given: TAS = 200 kt Track (T) = 073°
W/V = 210/20kt. Calculate the HDG (° T) and GS?
A) 077 - 210 kt.
B) 077 - 214 kt.
C) 079 - 211 kt.
D) 075 - 213 kt.

Given: TAS = 465 kt Track (T) = 007°
W/V = 300/80kt Calculate the HDG (° T) and GS?
A) 357 - 430 kt.
B) 000 - 430 kt.
C) 001 - 432 kt.
D) 358 - 428 kt.

Given: True HDG = 074° TAS = 230 kt
Track (T) = 066° GS = 242 kt
Calculate the W/V?
A) 180/40kt
B) 180/30kt
C) 180/35kt
D) 185/35kt

List elements required to establish DR position:

What is the final position after the following rhumb line tracks and distances have been followed from position 60° 00N 030° 00W?
South for 3600 NM
East for 3600 NM
North for 3600 NM
West for 3600 NM
The final position of the aircraft is:

A) 59° 00N 090° 00W
B) 60° 00N 030° 00E
C) 59° 00N 060° 00W
D) 60° 00N 090° 00W

A useful method of a pilot resolving, during a visual flight, any uncertainty in the aircrafts position is to maintain visual contact with the ground and:

A) fly reverse headings and associated timings until the point of departure is regained.
B) fly the reverse of the heading being flown prior to becoming uncertain until a pinpoint is obtained.
C) set heading towards a line feature such as a coastline, motorway, river or railway.
D) fly expanding circles until a pinpoint is obtained.

The departure between positions 60° N 160° E and 60sN x is 900 NM. What is the longitude of x?

A) 170° W
B) 145° E
C) 175° E
D) 140° W

An aircraft at latitude 10° South flies north at a GS of 890 km/HR. What will its latitude be after 1.5 HR?

A) 22° OON
B) 12° 15N
C) 02° 00N
D) 03° 50N

The Great Circle bearing of B (70° S 060° E), from A (70° S 030° W), is approximately?

A) 135° (T)
B) 090° (T)
C) 318° (T)
D) 150° (T)

Given:
Position A 45° N, ?° E
Position B 45° N, 45° 15E
Distance A-B=280 NM B is to the East of A Required: longitude of position A?

A) 38° 39E
B) 49° 57E
C) 40° 33E
D) 51° 51E

Refer to chart E(LO)1.
What is the aircraft position in lat and long given the following:
CRN (5318N 00857W) 18 DME
SHA (5243N 00853W) 20 DME
Heading 270 M
Both ranges DME decreasing.
A) 5203N 00843W
B) 5302N 00843W
C) 5301N 00908W
D) 5201N 00908W

What is dlat from 30° 39S 20° 20E to 45° 23N 40° 40E:
A) 76° 2 S
B) 14° 44 N
C) 76° 2 S
D) 76° 2 N

You are flying from A(30S 20E) to B (30S 20E). At what longitude will the GC track equal the RL track?
A) 10° E
B) 0° E/W
C) 10° W
D) 20° W

Position A is located on the equator at longitude 130° 00E. Position B is located 100NM from A on a bearing of 225° (T). The coordinates of position B are:
A) 01° 11N 131° 11E
B) 01° 11S 131° 11E
C) 01° 11S 128° 49E
D) 01° 11N 128° 49E

An aircraft at position 60GN 005° W tracks 090° (T) for 315 km. On completion of the flight the longitude will be:
A) 002° 10W
B) 000° 15E
C) 005° 15E
D) 000° 40E

What is the Chlong (in degrees and minutes) from A (45N 16530E) to B (45N 15540W)?
A) 38° 50W
B) 38° 50E
C) 38° 05W
D) 38° 05E

Calculate DR elements:

You are flying at FL 80 and the air temperature is ISA 15. What CAS is required to make TAS 240 Kt?
A) 206 Kt
B) 220 Kt
C) 226 Kt
D) 214 Kt

With 60° difference between runway and wind direction, if the minimum headwind required is 10kts and the maximum crosswind is 35kts what are the maximum and minimum winds speeds?
A) 40 and 15.
B) 40 and 20.
C) 45 and 15.
D) 45 and 20.

An aircraft is maintaining a 5.2% gradient is at 7 NM from the runway, on a flat terrain; its height is approximately:
A) 1890 FT
B) 3640 FT
C) 680 FT
D) 2210 FT

If the wind is 230° T/50 kts variation is 20° W and the TAS is 230 kts. What true heading is required to fly a true track of 025° ?
A) 044°
B) 020°
C) 029°
D) 018°

Given: Aircraft at FL 150 overhead an airport Elevation of airport 720 FT. QNH is 1003 hPa. OAT at FL150 -5° C. What is the true altitude of the aircraft? (Assume 1 hPa = 27 FT)
A) 15 840 FT
B) 14 160 FT
C) 15 280 FT
D) 14 720 FT

You are flying at a True Mach No of 0.82 in a SAT of -45° C. At 1000 hours you are 100 nm from the POL DME and your ETA at POL is 1012. ATC ask you to slow down to be at POL at 1016. What should your new TMN be if you reduce speed at 100 nm distance to:
A) M .72
B) M .76
C) M .68
D) M .61

Fuel flow is 22 USG per hour. With 83 Imperial gallons available what is the endurance of the aircraft?
A) 3 hrs 51 mins.
B) 3 hrs 46 mins.
C) 4 hrs 31 mins.
D) 8 hrs 20 mins.

Your pressure altitude is FL55, the QNH is 998, and the SAT is +30C. What is Density Altitude?
A) 8620 feet.
B) 6980 feet.
C) 7750 feet.
D) 10020 feet.

OAT = +35° C, Pressure alt = 5000 feet. What is true alt?
A) 4550 feet.
B) 5320 feet.
C) 4290 feet.
D) 5550 feet.

The pressure alt is 29000 feet and the SAT is -55C.
What is density altitude?
A) 26000 feet.
B) 31000 feet.
C) 30000 feet.
D) 27500 feet.

You are on ILS 3° glideslope which passes over the runway threshold at 50 feet. Your DME range is 25 nm from the threshold. What is your height above the runway threshold elevation? (Use the 1 in 60 rule and 6000feet = 1 nautical mile)
A) 7550 feet.
B) 7450 feet.
C) 8010 feet.
D) 6450 feet.

An aircraft is at 10N and is flying South at 444 km/hour. After 3 hours the latitude is:
A) 10S.
B) 02N.
C) 02S.
D) 0N/S.

What is the distance to touchdown when you are 670 ft QFE on a 3,2° glideslope approach?
A) 1,63 NM
B) 2,40 NM
C) 1,96 NM
D) 2,06 NM

Given: Pressure Altitude 29.000 FT, OAT -55" C.
Calculate the Density Altitude?
A) 33.500 FT
B) 26.000 FT
C) 31.000 FT
D) 27.500 FT

Given: Airport elevation is 1000 ft
QNH is 988 hPa. What is the approximate airport pressure altitude? (Assume 1 hPa = 27 FT)
A) 680 FT.
B) 1680 FT.
C) -320 FT.
D) 320 FT.

Given: FL 350, Mach 0.80, OAT -55° C.
Calculate the values for TAS and local speed of sound (LSS)?
A) 237 kt, LSS 296 kt.
B) 461 kt , LSS 576 kt.
C) 490 kt, LSS 461 kt.
D) 461 kt , LSS 296 kt.

Given: TAS 487kt
FL 330
Temperature ISA + 15
Calculate the MACH Number?
A) 0.78
B) 0.81
C) 0.84
D) 0.76

Given: TAS = 485 kt OAT = ISA +10° C
FL 410 Calculate the Mach Number?
A) 0.90
B) 0.87
C) 0.85
D) 0.825

A flight is to be made from A 49° S 180° E/W to B 58° S, 180° E/W. The distance in kilometres from A to B is approximately:
A) 804
B) 1000
C) 1222
D) 540

An aircraft leaves point A (75N 50W) and flies due North. At the North Pole if flies due south along the meridian of 65° 50E unit reaches 75N (point B). What is the total distance covered?
A) 2175 nm
B) 1650 nm
C) 1800 nm
D) 2000 nm

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21. An aircraft takes off from the aerodrome of BRIOUDE (altitude 1 483 FT, QFE = 963 hPa, temperature = 32° C). Five minutes later, passing 5 000 FT on QFE, the second altimeter set on 1 013 hPa will indicate approximately:
A) 6 000 FT.
B) 4 000 FT.
C) 6 400 FT.
D) 6 800 FT.

You want to fly 12000 ft above a frozen lake at elevation 930 ft AMSL. You have obtained QNH from an airfield in the area. Climbing, you observe that the air temperature at FL 80 is -20° C. What should your indicated altitude be when you are 12 000 ft above the frozen lake? Use the mechanical computer for the calculations?
A) 12560 ft
B) 12000 ft
C) 13950 ft
D) 11950 ft

Construct DR position on Mercator, Lamberts and Polar Stereographic Projection Charts:

The constant of the cone of a Lamberts chart is given as 0.75. A straight line drawn from A (45° N 60° W) to C on 10° W passes through B on 28° W. The direction of the track is 055° (T) at A. The approximate rhumb line track from A to B is:

A) 079° T
B) 055° T
C) 043° T
D) 067° T

A straight line track is drawn on a Polar Stereographic chart from D(85° N 80° W) to E(85° N 130° E). The track angle (° T) D to E, measured at 180° E/W is:

A) 085° (T)
B) 245° (T)
C) 155° (T)
D) 065° (T)

A straight line track is drawn on a Polar Stereographic chart from D (85° N 80° W) to E (85° N 130° E). The track angle (° T) D to E, measured at D is:

A) 015° (T)
B) 195° (T)
C) 345° (T)
D) 165° (T)

For this question use chart AT(H/L)2
1300 UTC DR position 37° 30N 021° 30W alter heading PORT SANTO NDB (33° 03N 016° 23W) TAS 450 kt, Forecast W/V 360° /30kt. Calculate the ETA at PORT SANTO NDB?

A) 1354
B) 1344
C) 1348
D) 1341

The constant of the cone of a Lamberts chart is given as 0.75. A straight line drawn from A (45° N 60° W) to C on 10° W passes through B on 28° W. The direction of the track is 055° (T) at A. The direction of the straight line track A to C, measured at B is:

A) 067° T
B) 079° T
C) 031° T
D) 055° T

An aircraft takes off from 40° 20N 078° 38E and flies a Rhumb Line track of 090° . What is the longitude after it has flown 219 nm:

A) 83° 25W
B) 83° 25E
C) 73° 51E
D) 73° 51E

Given: True course A to B = 250° Distance A to B = 315 NM TAS = 450 kt. W/V = 200° /60kt. ETD A = 0650 UTC. What is the ETA at B?

A) 0736 UTC.
B) 0716 UTC.
C) 0730 UTC.
D) 0810 UTC.

A straight line track is drawn on a Polar Stereographic chart from D (85° N 80° W) to E(85° N 130° E). The track angle (° T) E to D, measured at E is:

A) 195° (T)
B) 015° (T)
C) 345° (T)
D) 165° (T)

The great circle distance between position A (59° 34.1N 008° 08.4E) and B (30° 25.9N 171° 51.6W) is:

A) 2 700 NM.
B) 5 400 NM.
C) 10 800 NM.
D) 10 800 km.

Given: A polar stereographic chart whose grid is aligned with the zero meridian. Grid track 344° , Longitude 115° 00W, Calculate the true course?

A) 229°
B) 099°
C) 049°
D) 279°

You are flying from A (50N 10W) to B (58N 02E). At what longitude will the Great Circle track equal the Rhumb Line (RL) track between A and B:

A) 04° E
B) 0° W
C) 04° W
D) 06° W

A Lamberts Conical conformal chart has standard parallels at 63N and 41N. What is the constant of the cone?

A) 0.891
B) 0.656
C) 0.788
D) 0.707

Name range specifics of maximum range and radius of action:

An aircraft was over A at 1435 hours flying direct to B. Given:
Distance A to B 2900 NM
True airspeed 470 kt
Mean wind component OUT +55 kt
Mean wind component BACK -75 kt
Safe endurance 9 HR 30 MIN
The distance from A to the Point of Safe Return (PSR) A is:
A) 1611 NM.
B) 1759 NM.
C) 2844 NM.
D) 2141 NM.

An aircraft takes-off from an airport 2 hours before sunset. The pilot flies a track of 090° (T), W/V 130° / 20 kt, TAS 100 kt. In order to return to the point of departure before sunset, the furthest distance which may be travelled is:
A) 115 NM
B) 97 NM
C) 105 NM
D) 84 NM

Given:
AD = Air distance GD = Ground distance
TAS = True Airspeed GS = Groundspeed
Which of the following is the correct formula to calculate ground distance (GD) gone?
A) GD = TAS/(GS X AD)
B) GD = (AD X GS)/TAS
C) GD = (AD - TAS)/TAS
D) GD = AD X (GS -TAS)/GS

Given: Distance A to B is 360 NM
Wind component A - B is -15 kt
Wind component B - A is +15 kt
TAS is 180 kt. What is the distance from the equal-time-point to B?
A) 195 NM.
B) 165 NM.
C) 170 NM.
D) 180 NM.

Given:Distance A to B 3623 NM Groundspeed out 370 kt
Groundspeed back 300 kt The time from A to the Point of Equal Time (PET) between A and B is:
A) 323 MIN.
B) 288 MIN.
C) 263 MIN.
D) 238 MIN.

Given: Distance Q to R 1760 NM, Groundspeed out 435 kt, Groundspeed back 385 kt
The time from Q to the Point of Equal Time (PET) between Q and R is:
A) 110 MIN.
B) 106 MIN.
C) 102 MIN.
D) 114 MIN.

An aircraft has a TAS of 300 knots and a safe endurance of 10 hours. If the wind component on the outbound leg is 50 knots head, what is the distance to the point of safe endurance?
A) 1458 nm.
B) 1622 nm.
C) 1544 nm.
D) 1500 nm

Given:Distance Q to R 1760 NM
Groundspeed out 435 kt Groundspeed back 385 kt
Safe endurance 9 HR The distance from Q to the Point of Safe Return (PSR) between Q and R is:
A) 1838 NM.
B) 1467 NM.
C) 1313 NM.
D) 1642 NM.

You have calculated Point of No Return (PNR) on a flight, having all negative WCs in the flight plan. During the flight you experience that the W/V is stronger but coming from the same direction as in the flight plan. Consider the following statements:
A) The PNR will, if recalculated, move toward the no-wind PNR.
B) The PNR will not change because the neither TAS nor Fuel Flow has changed.
C) A recalculated PNR will move toward the place of departure.
D) You will arrive at the PNR at a later time than flight planned.

An aircraft was over A at 1435 hours flying direct to B. Given: Distance A to B 2.900 NM True airspeed 470 kt Mean wind component OUT +55 kt Mean wind component BACK -75 kt The ETA for reaching the Point of Equal Time (PET) between A and B is:
A) 1744
B) 1846
C) 1657
D) 1721

Question 747 of 995
An aircraft was over Q at 1320 hours flying direct to R. Given:

- Distance Q to R 3016 NM
- True airspeed 480 kt
- Mean wind component out 90 kt
- Mean wind component back 75 kt
- Safe endurance 10:00 HR

The distance from Q to the Point of Safe Return (PSR) Q is:
A) 1510 NM
B) 2370 NM
C) 2290 NM
D) 1310 NM

Given: Distance A to B 1973 NM Groundspeed OUT 430 kt
Groundspeed BACK 385 kt The time from A to the Point of Equal Time (PET) between A and B is:
A) 181 MIN.
B) 130 MIN.
C) 145 MIN.
D) 162 MIN.

Given: Distance A to B 2346 NM Groundspeed OUT 365 kt
Groundspeed BACK 480 kt Safe endurance 8 HR 30 MIN
The time from A to the Point of Safe Return (PSR) A is:
A) 290 MIN.
B) 209 MIN.
C) 219 MIN.
D) 197 MIN.

From the departure point, the distance to the point of equal time is:
A) inversely proportional to the total distance to go.
B) inversely proportional to the sum of ground speed out and ground speed back.
C) proportional to the sum of ground speed out and ground speed back.
D) inversely proportional to ground speed back.

Question 751 of 995

Two points A and B are 1000 NM apart. TAS = 490 kt. On the flight between A and B the equivalent headwind is -20 kt. On the return leg between B and A, the equivalent headwind is +40 kt. What distance from A, along the route A to B, is the Point of Equal Time (PET)?
A) 455 NM.
B) 530 NM.
C) 470 NM.
D) 500 NM.

You fly from C to D, a distance of 450 NM. The WC C - D is +30, and the WC D - C is -40. TAS is 160 Kt and reduced TAS is 130 Kt. The Fuel Flow is 165 kg/hr, and the Safe endurance when overhead C is 4 hours.
Calculate PET between C and D, based on reduced TAS for the flight from PET to C/D. What is the flying time from C to PET?
A) 0:51
B) 1:48
C) 1:04
D) 1:21

Given:Distance A to B 2484 NM
Mean groundspeed out 420 kt
Mean groundspeed back 500 kt
Safe endurance 08 HR 30 MIN
The distance from A to the Point of Safe Return (PSR) A is:
A) 1908 NM.
B) 1940 NM.
C) 1630 NM.
D) 1736 NM.

An aircraft was over Q at 1320 hours flying direct to R. Given: Distance Q to R 3016 NM True airspeed 480 kt
Mean wind component OUT -90 kt Mean wind component BACK +75 kt. The ETA for reaching the Point of Equal Time (PET) between Q and R is:
A) 1752
B) 1756
C) 1820
D) 1742

Given: Distance A to B 2484 NM
Groundspeed OUT 420 kt Groundspeed BACK 500 kt
The time from A to the Point of Equal Time (PET) between A and B is:
A) 163 MIN.
B) 173 MIN.
C) 193 MIN.
D) 183 MIN.

For a distance of 1860 NM between Q and R, a ground speed OUT of 385 kt, a ground speed BACK of 465 kt and an endurance of 8 HR (excluding reserves) the distance from Q to the point of safe return (PSR) is:
A) 930 NM
B) 1685 NM
C) 1532 NM
D) 1865 NM

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21. You fly from C to D, a distance of 450 NM. The WC C - D is +30, and the WC D - C is -40. TAS is 160 Kt and reduced TAS is 130 Kt. The Fuel Flow is 165 kg/hr, and the Safe endurance when overhead C is 4 hours. Calculate PNR for return to C. What is the distance from PNR to D?
A) 180,0 NM.
B) 155,5 NM.
C) 243,0 NM.
D) 95,5 NM.

The distance from A to B is 2368 nautical miles. If outbound groundspeed in 365 knots and homebound groundspeed is 480 knots and safe endurance is 8 hours 30 minutes, what is the time to the PNR?
A) 290 minutes.
B) 190 minutes.
C) 209 minutes.
D) 219 minutes.

Why do we normally overlook the descend phase when calculating Point of Equal Time (PET)?
A) Because we never know what kind of descend clearance we will get from ATC.
B) Because there are so many uncertain factors in the descend phase.
C) Because the descend will have an equal effect, whatever destination we decide to proceed to.
D) Because the W/V during the descend is not known in academic situations.

Miscellaneous DR uncertainties and practical means of correction:

Calculate the dlong from N001 15 E090 00 to N001 15 E015 15:
A) 105° 15N
B) 74° 45W
C) 74° 45E
D) 74° 15E

Calculate the dlat from N 001 15 E090 00 to S090 00:
A) 91° 15N
B) 88° 45N
C) 268° 15N
D) 91° 15S

By the term "lower transit" (of a heavenly body) it is understood that:
A) the body is passing the meridian of the observer or another specified meridian.
B) the body is passing the anti meridian of the observer.
C) the body is at the same celestial meridian as another body.
D) the body is moving.

In-Flight Navigation:
Use of visual observations and application to in-flight navigation

A ground feature appears 30° to the left of the centre line of the CRT of an airborne weather radar. If the heading of the aircraft is 355° (M) and the magnetic variation is 15° East, the true bearing of the aircraft from the feature is:
A) 220°
B) 310°
C) 160°
D) 130°

An island appears 30° to the left of the centre line on an airborne weather radar display. What is the true bearing of the aircraft from the island if at the time of observation the aircraft was on a magnetic heading (MH) of 020° with the magnetic variation (VAR) 25° W?
A) 205°
B) 325°
C) 145°
D) 195°

An island appears 60° to the left of the centre line on an airborne weather radar display. What is the true bearing of the aircraft from the island if at the time of observation the aircraft was on a magnetic heading (MH) of 276° with the magnetic variation (VAR) 10° E?
A) 086°
B) 226°
C) 046°
D) 026°

What do you understand by the term white-out?
A) Taking off from a snow-covered lake.
B) When the terrain is covered with snow and the horizon blend with the sky, visual visual determination of height becoming difficult.
C) Flight conditions when you suddenly enter a cloud and all get white outside the cockpit windows.
D) Flying in heavy snow.

During a low level flight 2 parallel roads that are crossed at right angles by an aircraft. The time between these roads can be used to check the aircraft:
A) track.
B) groundspeed.
C) drift.
D) position.

An island is observed by weather radar to be 15° to the left. The aircraft heading is 120° (M) and the magnetic variation 17° W. What is the true bearing of the aircraft from the island?
A) 302°
B) 122°
C) 088°
D) 268°

Under which circumstances will an aircrafts radius of action be greatest?
A) Direct head wind outbound.
B) Wind at 45° to track.
C) Direct cross wind outbound.
D) Direct tail wind outbound.

An island appears 45° to the right of the centre line on an airborne weather radar display. What is the true bearing of the aircraft from the island if at the time of observation the aircraft was on a magnetic heading (MH) of 215° with the magnetic variation (VAR) 21° W?
A) 239°
B) 329°
C) 059°
D) 101°

An island appears 30° to the right of the centre line on an airborne weather radar display. What is the true bearing of the aircraft from the island if at the time of observation the aircraft was on a magnetic heading (MH) of 355° with the magnetic variation (VAR) 15° E?
A) 160°
B) 220°
C) 190°
D) 130°

You are flying a VFR route and have become uncertain of your position. Which is the best course of action?
A) Turn round and fly your flight plan tracks in reverse until you see something you recognised before.
B) Fly a series of ever-expanding circles from your present position till you find your next check point.
C) Turn round and fly your flight plan in reverse back to base.
D) Set heading towards a line feature - coastline, river, or motorway.

An island is observed to be 15° to the left. The aircraft heading is 120° (M), variation 17° (W). The bearing ° (T) from the aircraft to the island is:
A) 268
B) 088
C) 122
D) 302

A ground feature was observed on a relative bearing of 315° and 3 MIN later on a relative bearing of 270° . The W/V is calm; aircraft GS 180 kt. What is the minimum distance between the aircraft and the ground feature?
A) 9 NM.
B) 12 NM.
C) 6 NM.
D) 3 NM.

Navigation in climb and descent:

An aircraft at FL350 is required to descend to cross a DME facility at FL80. Maximum rate of descent is 1800 FT/MIN and mean GS for descent is 276 kt. The minimum range from the DME at which descent should start is:
A) 69 NM.
B) 49 NM.
C) 59 NM.
D) 79 NM.

Given: ILS GP angle = 3.5 DEG, GS = 150 kt. What is the approximate rate of descent?
A) 875 FT/MIN.
B) 700 FT/MIN.
C) 300 FT/MIN.
D) 350 FT/MIN.

An aircraft at FL370 is required to commence descent when 100 NM from a DME facility and to cross the station at FL120. If the mean GS during the descent is 396 kt, the minimum rate of descent required is approximately:
A) 1550 FT/MIN.
B) 2400 FT/MIN.
C) 1650 FT/MIN.
D) 1000 FT/MIN.

An aircraft at FL350 is required to commence descent when 85 NM from a VOR and to cross the VOR at FL80. The mean GS for the descent is 340 kt. What is the minimum rate of descent required?
A) 1900 FT/MIN.
B) 1600 FT/MIN.
C) 1800 FT/MIN.
D) 1700 FT/MIN.

On a 12% glide slope, your groundspeed is 540 knots. What is your rate of descent?
A) 3120 feet/min.
B) 4820 feet/min.
C) 6550 feet/min.
D) 8740 feet/min.

An aircraft at FL330 is required to commence descent when 65 NM from a VOR and to cross the VOR at FL100. The mean GS during the descent is 330 kt. What is the minimum rate of descent required?
A) 1950 FT/MIN.
B) 1850 FT/MIN.
C) 1650 FT/MIN.
D) 1750 FT/MIN.

An aircraft at FL390 is required to descend to cross a DME facility at FL70. Maximum rate of descent is 2500 FT/MIN, mean GS during descent is 248 kt. What is the minimum range from the DME at which descent should commence?
A) 68 NM.
B) 58 NM.
C) 53 NM.
D) 63 NM.

(Refer to Jeppesen Manual chart E(LO)1A)
When at BEKET (N58° 53.2 W001° 31.3) the RMI bearing to KW would be:
A) 262°
B) 279°
C) 272°
D) 248°

Given: aircraft height 2500 FT, ILS GP angle 3° . At what approximate distance from THR can you expect to capture the GP?
A) 13.1 NM.
B) 8.3 NM.
C) 14.5 NM.
D) 7.0 NM.

At 0422 an aircraft at FL370, GS 320kt, is on the direct track to VOR X 185 NM distant. The aircraft is required to cross VOR X at FL80. For a mean rate of descent of 1800 FT/MIN at a mean GS of 232 kt, the latest time at which to commence descent is:
A) 0445
B) 0454
C) 0451
D) 0448

An aircraft at FL350 is required to cross a VOR/DME facility at FL110 and to commence descent when 100 NM from the facility. If the mean GS for the descent is 335 kt, the minimum rate of descent required is:
A) 1290 FT/MIN.
B) 1340 FT/MIN.
C) 1240 FT/MIN.
D) 1390 FT/MIN.

What is the effect on the Mach number and TAS in an aircraft that is climbing with constant CAS?
A) Mach number increases; TAS increases.
B) Mach number remains constant; TAS increases.
C) Mach number decreases; TAS decreases.
D) Mach number increases; TAS remains constant.

Given: TAS = 197 kt True course = 240°
W/V = 180/30kt Descent is initiated at FL 220 and completed at FL 40. Distance to be covered during descent is 39 NM. What is the approximate rate of descent?
A) 950 FT/MIN.
B) 1400 FT/MIN.
C) 1500 FT/MIN.
D) 800 FT/MIN.

If flying the climb speed profile would cause a violation of an altitude constraint:
A) The HOLD message appears.
B) The NEXT ALT message appears.
C) The UNABLE NEXT ALT message appears.
D) The ALT message appears,

You are required to descend from FL 230 to FL 50 over a distance of 32 NM in 7 minutes. What will the glideslope be when you expect WC-25 during the descend?
A) 4,68°
B) 5,29°
C) 4,07°
D) 6,25°

On a 12% glide slope with a groundspeed of 540 kts the required rate of descent is:
A) 6500 feet/min.
B) 4800 feet/min.
C) 8700 feet/min.
D) 3100 feet/min.

An aircraft is descending down a 12% slope whilst maintaining a GS of 540 kt. The rate of descent of the aircraft is approximately:
A) 6500 FT/MIN.
B) 3900 FT/MIN.
C) 4500 FT/MIN.
D) 650 FT/MIN.

An aircraft at FL290 is required to commence descent when 50 NM from a VOR and to cross that VOR at FL80. Mean GS during descent is 271kt. What is the minimum rate of descent required?
A) 1800 FT/MIN.
B) 2000 FT/MIN.
C) 1900 FT/MIN.
D) 1700 FT/MIN.

Assuming zero wind, what distance will be covered by an aircraft descending 15000 FT with a TAS of 320 kt and maintaining a rate of descent of 3000 FT/MIN?
A) 38.4 NM.
B) 16.0 NM.
C) 26.7 NM.
D) 19.2 NM.

You are required to descend from FL 230 to FL 50 over a distance of 32 NM in 7 minutes. What is the required TAS when you expect WC-25 during the descent?
A) 317 Kt.
B) 300 Kt.
C) 329 Kt.
D) 308 Kt.

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21. At 65 nm from a VOR you commence a descent from FL330 in order to arrive over the VOR at FL 100. Your mean groundspeed in the descent is 240 knots. What rate of descent is required?
A) 1270 feet/min.
B) 1420 feet/min.
C) 1630 feet/min.
D) 1830 feet/min.

An aircraft at FL370 is required to commence descent at 120 NM from a VOR and to cross the facility at FL130. If the mean GS for the descent is 288 kt, the minimum rate of descent required is:
A) 960 FT/MIN.
B) 860 FT/MIN.
C) 920 FT/MIN.
D) 890 FT/MIN.

You are required to descend from FL 230 to FL 50 over a distance of 32 NM in 7 minutes. What is the required Rate of Descent when you expect WC-25 during the descent?
A) 2570 ft/min.
B) 2230 ft/min.
C) 2458 ft/min.
D) 2157 ft/min.

Navigation in cruising Flight, Use of fixes to Revise Navigation Data:

A pilot receives the following signals from a VOR DME station: radial 180° +/- 1° , distance = 200 NM. What is the approximate error?
A) +/- 2 NM.
B) +/- 3.5 NM.
C) +/- 7 NM.
D) +/- 1 NM.

There are two NDB' s, one 20 NM inland, and the other 50 NM inland from the coast. Assuming that the error caused by coastal refraction is the same for both propagations, the extent of the error in a position line plotted by an aircraft that is over water will be:
A) the same from both beacons when the aircraft is on a relative bearing of 090° and 270° .
B) greater from the beacon that is. 50 NM inland.
C) greater from the beacon that is 20 NM inland.
D) the same from both beacons when the aircraft is on a relative bearing of 180° and 360° .

RIX (N56° 53.8 E023° 58.0) 164° (RMI)/ 48 NM DME. The position of the aircraft is:
A) 57° 42N 023° 40E
B) 57° 42N 023° 50E
C) 57° 48N 023° 43E
D) 57° 50N 023° 38E

A ground feature was observed on a relative bearing of 325° and five minutes later on a relative bearing of 280° . The aircraft heading was 165° (M), variation 25° W, drift 10° Right and GS 360 kt. When the relative bearing was 280° , the distance and true bearing of the aircraft from the feature was:
A) 30 NM and 060° .
B) 40 NM and 290° .
C) 40 NM and 110° .
D) 30 NM and 240° .

Refer to chart E(LO)1.
What is the average magnetic track and distance between Kerry NDB (KER, 5211N 00932W) and Carnmore NDB (CRN, 5318N 00856W)?
A) 205 71 nm.
B) 197 71 nm.
C) 017 70 nm.
D) 025 70 nm.

An aircraft leaves A at 1400, flying at Mach 0.84 (OAT – 58° C). The ETA B is 1436 and the distance between A and B is 300 nm. At what time must a speed adjustment be made if the arrival time is changed to 1438:
A) 1427.5
B) 1428.5
C) 1425.5
D) 1426.5

Given: Distance A to B is 100 NM, Fix obtained 40 NM along and 6 NM to the left of course. What heading alteration must be made to reach B?
A) 6° Right.
B) 15° Right.
C) 9° Right.
D) 18° Right.

(Refer to Jeppesen Manual chart E(LO)1)
If MAC (N55° 25.8 W005° 39.0) 25 nm DME and GOW (N55° 25.8 W004° 26.7) 31 nm DME, the position of the aircraft is:
A) 55° 48N 005° 20W
B) 55° 29N 005° 13W
C) 55° 51N 005° 10W
D) 55° 50N 005° 50W

An aircraft at FL370, M0.86, OAT -44° C, headwind component 110 kt, is required to reduce speed in order to cross a reporting point 5 MIN later than planned. If the speed reduction were to be made 420 NM from the reporting point, what Mach Number is required?
A) M0.79
B) M0.81
C) M0.73
D) M0.75

The distance from departure point to point of equal time is:
A) inversely proportional to total distance.
B) proportional to cosine of latitude.
C) inversely proportional to groundspeed out and groundspeed back.
D) inversely proportional to groundspeed back.

Given:
Distance A to B 2346 NM
Groundspeed out 365 kt
Groundspeed back 480 kt
The time from A to the Point of Equal Time (PET) between A and B is:
A) 260 min
B) 167 min
C) 219 min
D) 197 min

(Refer to Jeppesen Manual chart E(LO)1)
If MAC (N55° 25.8 W005° 39.0) indicates 124° on the RMI and ISY (N55° 41.0 W006° 15.0) indicates 80 nm on the DME the position of the aircraft is:
A) 55° 52N 007° 11W
B) 56° 15N 008° 25W
C) 55° 58N 007° 09W
D) 56° 19N 008° 20W

An aircraft is planned to fly from position A to position B, distance 480 NM at an average GS of 240 kt. It departs A at 1000 UTC. After flying 150 NM along track from A, the aircraft is 2 MIN behind planned time. Using the actual GS experienced, what is the revised ETA at B?
A) 1157
B) 1206
C) 1203
D) 1153

(Refer to Jeppesen Manual chart E(LO)1A)
An aircraft is cleared to route direct from WIK (N58° 27.6 W003° 05.9) to NADIR (N57° 49.5 E000° 00.0) at FL180. Forecast wind 340° T/50kts, temperature -25° C, TAS 200 kts. The require true heading for the aircraft will be:
A) 111°
B) 117°
C) 122°
D) 100°

(Refer to Jeppesen Manual chart E(LO)1)
An aircraft is overhead MAC (N55° 25.8 W005° 39.0) at 1054 UTC. The aircraft is at FL270, COAT -40° C and the wind is 290° T/50 kts. In order for the aircraft to enter Shanwick Oceanic airspace at 56° N 010° W at 1114 UTC it should fly at a Mach No. of:
A) 0.72
B) 0.84
C) 0.80
D) 0.76

An aircraft is planned to fly from position A to position B, distance 320 NM, at an average GS of 180 kt. It departs A at 1200 UTC. After flying 70 NM along track from A, the aircraft is 3 MIN ahead of planned time. Using the actual GS experienced, what is the revised ETA at B?
A) 1340 UTC.
B) 1347 UTC.
C) 1333 UTC.
D) 1401 UTC.

Refer to chart E(LO)1.
The aircraft position is at 5330N 00800W. The VOR' s are tuned to Shannon (SHA, 5243N 00853W) and Connaught (CON, 5355N 00849W). Which radials will be indicated?
A) 213 310
B) 042 138
C) 033 130
D) 221 318

(Refer to Jeppesen Manual chart E(LO)1)
An aircraft is overhead TRN (N55° 18.8 W004° 47.0) at 2320 UTC; flying with a CAS of 250 kts, at FL180, COAT - 15° C, wind 250° T/60kts. Variation is 7° W and the aircraft is routing via airway B2. What is the estimated time of arrival at MULLA?
A) 2336 UTC.
B) 2355 UTC.
C) 2333 UTC.
D) 2344 UTC.

Given:
Distance A to B 1973 NM
Groundspeed out 430 kt
Groundspeed back 385 kt
Safe endurance 7 HR 20 MIN
The distance from A to the Point of Safe Return (PSR) A is:
A) 1422 nm
B) 1664 nm
C) 1698 nm
D) 1490 nm

(Refer to Jeppesen Manual chart E(LO)1)
When at FYNER (N56° 03.0 W005° 07.0) the DME range from MAC (N55° 25.8 W005° 39.0) is:
A) 29 nm.
B) 16 nm.
C) 41 nm.
D) 25 nm.

21. (Refer to Jeppesen Manual chart E(LO)1)
When an aircraft is at BLACA (N54° 53.0 W005° 09.5) the DME range from BEL will be:
A) 23 nm.
B) 16 nm.
C) 51 nm.
D) 39 nm.

Please refer to chart E(LO)1.
An aircraft is on the 025 radial from Shannon VOR (SHA, 5243N 00853W) at 49 DME. What is its position?
A) 5239N 00830W
B) 5229N 00930W
C) 5329N 00930W
D) 5329N 00830W

An aircraft is planned to fly from position A to position B, distance 250 NM at an average GS of 115 kt. It departs A at 0900 UTC. After flying 75 NM along track from A, the aircraft is 1.5 MIN behind planned time. Using the actual GS experienced, what is the revised ETA at B?
A) 1050 UTC.
B) 1110 UTC.
C) 1044 UTC.
D) 1115 UTC.

An aircraft at FL120, IAS 200kt, OAT -5° and wind component +30kt, is required to reduce speed in order to cross a reporting point 5 MIN later than planned. Assuming flight conditions do not change, when 100 NM from the reporting point IAS should be reduced to:
A) 159 kt.
B) 169 kt.
C) 165 kt.
D) 174 kt.

Please refer to chart E(LO)1.
What is the mean true track and distance from the BAL VOR (5318N 00627W) to CFN NDB (5502N 00820W)?
A) 328 134
B) 148 134
C) 328 125
D) 148 125

A co-located VOR/DME is at 66° 42N 043° 15W where magnetic variation is 45° W and the transmitter aerial is 500 ft amsl. An aircraft flying at FL 330 is on the 225° radial and has a DME range of 10 nm; its position is:
A) 66° 42N 043° 25W
B) 66° 42N 043° 05W
C) 66° 50N 043° 15W
D) 66° 34N 043° 15W

An aircraft is flying at FL 140 where the COAT is -5° C. It is flying at an indicated air speed of 260 kts and is experiencing a headwind of 34 knots. When 150 nm from the FIR boundary it is instructed to reduce speed in order to delay arrival at the boundary by 5 minutes. The required reduction in indicated air speed is:
A) 24 kts.
B) 33 kts.
C) 41 kts.
D) 15 kts.

Please refer to chart AT(HI)5.
What is the average magnetic course and distance between 6000N 02000W and Sumburgh VOR?
A) 095; 562nm.
B) 105; 562nm.
C) 095; 468nm.
D) 105; 468nm.

An aircraft at position 2700N 17000W travels 3000 km on a track of 180T, then 3000 km on a track of 090T, then 3000 km on a track of 000T, then 3000 km on a track of 270T. What is its final position?
A) 2700N 17318W.
B) 2700N 14300W.
C) 2700N 17000W.
D) 0000N/S 17000W.

Please refer to chart E(LO)1.
Kerry (5210.9N 00932.0W) is 41 nm DME, Galway (5318.1N 00856.5W) is 50 nm DME.
What is your position?
A) 5219N 00809W.
B) 5230N 00834W.
C) 5255N 00819W.
D) 5242N 00827W.

The distance between two waypoints is 200 NM, To calculate compass heading, the pilot used 2° E magnetic variation instead of 2° W. Assuming that the forecast W/V applied, what will the off track distance be at the second waypoint?
A) 0 NM.
B) 14 NM.
C) 7 NM.
D) 21 NM.

An island appears 30° to the left of the centre line on an airborne weather radar display. What is the true bearing of the aircraft from the island if at the time of observation the aircraft was on a magnetic heading of 276° with the magnetic variation 12° W?
A) 318°
B) 038°
C) 234°
D) 054°

An aircraft at FL310, M0.83, temperature -30° C, is required to reduce speed in order to cross a reporting point five minutes later than planned. Assuming that a zero wind component remains unchanged, when 360 NM from the reporting point Mach Number should be reduced to:
A) M0.80
B) M0.78
C) M0.76
D) M0.74

Refer to chart E(LO)1.
What is the average true track and distance between WTD NDB (5211.3N 00705.0W) and FOY NDB (5234.0N 00911.7W) Track Dist
A) 286 76
B) 294 76
C) 294 81
D) 286 81

An aircraft at 66° N 029° W obtains a bearing of 141° (relative) from a NDB at 64° N 022° W. The aircraft is heading 352° M and the variation is 15° W. The bearing to plot from the NDB on a Polar Stereographic chart is:
A) 291° (T)
B) 335° (T)
C) 298° (T)
D) 305° (T)

An aircraft is heading north and its groundspeed is 120 knots. A radio beacon indicates a bearing of 085° on the RMI and 5 minutes later the bearing is 090° on the RMI. Using the 1 in 60 rule the approximate range of the aircraft from the radio beacon is:
A) 150 nm.
B) 120 nm.
C) 180 nm.
D) 60 nm.

An aircraft is flying at FL 120, IAS 200 knots, temperature – 5° C, wind component 30 knots. At a position 100 nm from the next reporting point the aircraft is ordered to delay arrival by 5 minutes. The immediate reduction in IAS to comply with this request is:
A) 32 knots
B) 41 knots
C) 16 knots
D) 50 knots

The distance between positions A and B is 180 NM. An aircraft departs position A and after having travelled 60 NM, its position is pinpointed 4 NM left of the intended track. Assuming no change in wind velocity, what alteration of heading must be made in order to arrive at position B?
A) 2° Left
B) 4° Right
C) 6° Right
D) 8° Right

(Refer to Jeppesen Manual chart E(LO)1)
An aircraft is cleared to enter Shanwick Oceanic Control Area at 56° N010° W. The VOR radials from TIR (N56° 29.6 W006° 52.6) and SLG (N54° 16.7 W008° 36.0) which will indicate this OCA entry point are:
A) TIR : 075° ; SLG : 154° .
B) TIR :256° ; SLG : 335° .
C) TIR :083° ; SLG : 163° .
D) TIR :263° ; SLG : 343° .

As the INS position of the departure aerodrome, coordinates 35° 32.7N 139° 46.3W are input instead of 35° 32.7N 139° 46.3E. When the aircraft subsequently passes point 52° N 180° W, the longitude value show on the INS will be:
A) 099° 32.6 E
B) 099° 32.6 W
C) 080° 27.4 E
D) 080° 27.4 W

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41. Please refer to chart E(LO)1.
You are at position 5340N 00800W. What is the QDR from the SHA VOR (5243N 00853W)?
A) 217
B) 037
C) 029
D) 209

The design requirements for DME stipulate that, at a range of 100 NM, the maximum systematic error should not exceed:
A) + or - 1.5 NM
B) + or - 0.25 NM
C) + or - 3 NM
D) + or - 1.25 NM

Isogrivs on a chart indicate lines of:
A) zero magnetic variation.
B) equal horizontal directive force.
C) equal grivation.
D) equal magnetic dip.

An aircraft on a magnetic heading of 311° , drift 10° port (left), variation 10° E, measures a relative bearing to a NDB of 270° (rel.). What is the aircrafts QDM to the NDB?
A) 211°
B) 231°
C) 241°
D) 221°

Aircraft flying from RIX (N56° 53.8 E023° 58.0) to KEPIT (N57° 15.8 E025° 21.2) is required to report at AMOLI (N57° 15.8 E025° 21.2). At AMOLI the RMI bearing to GL (N56° 57.0 E025° 45.1) will be:
A) 119°
B) 147°
C) 141°
D) 090°

What is the Rhumb Line track from A (4500N 01000W) to B (4830N 01500W)?
A) 150 T.
B) 315 T.
C) 215 T.
D) 330 T.

Please refer to chart E(LO)1.
You are on a heading of 105C, deviation 3 E. WTD NDB (5211.3N 00705.0W) bears 013 R, CRK VOR (5150.4N 00829.7W) QDM is 211. What is your position?
A) 5245N 00757W.
B) 5228N 00802W.
C) 5412N 00639W.
D) 5217N 00745W.

(Refer to Jeppesen Manual chart E(LO)1)
BEL (N54° 39.7 W006° 13.8) 085° RMI and 47 nm DME. The position of the aircraft is:
A) 54° 35N 007° 33W
B) 54° 30N 007° 30W
C) 54° 20N 007° 26W
D) 54° 33N 007° 00W

TAS=240 knots. The relative bearing from an NDB is 315R at 1410.
At 1420 the bearing has changed to 270R. What is your distance from the NDB at 1420?
A) 70 nm.
B) 40 nm.
C) 50 nm.
D) 60 nm.

Given: Distance A to B is 90 NM, Fix obtained 60 NM along and 4 NM to the right of course. What heading alteration must be made to reach B?
A) 12° Left.
B) 8° Left.
C) 4° Left.
D) 16° Left.

Please refer chart E(LO)1.
What is the radial and DME distance from Connaught VOR/DME (CON, 5355N 00849W) to overhead Abbey Shrule aerodrome(5336N 00739W)?
A) 296 46 nm.
B) 116 46 nm.
C) 304 47 nm.
D) 124 47 nm.

At 13:00 UTC an aircraft is on the 330° radial and 40 nm from a co-located VOR/DME. At 13:25 the aircraft is on the 020° radial and 40 nm from the same VOR/DME. If variation is 0° E/W how far has the aircraft travelled and what has been its track?
A) 43 nm and 085° T.
B) 43 nm and 095° T.
C) 34 nm and 085° T.
D) 34 nm and 095° T.

Given: Half way between two reporting points the navigation log gives the following information: TAS 360 kt, W/V 330° /80kt, Compass heading 237° , Deviation on this heading -5° , Variation 19° W. What is the average ground speed for this leg?
A) 373 kt.
B) 403 kt.
C) 354 kt.
D) 360 kt.

(Refer to Jeppesen Manual chart E(LO)1)
TIR (N56° 29.6 W006° 52.6) and ISY (N55° 25.8 W006° 15.0) both show DME range 60 nm. The position of the aircraft is:
A) 55° 31N 007° 12W
B) 56° 14N 007° 47W
C) 55° 45N 008° 02W
D) 55° 57N 007° 09W

Given: ETA to cross a meridian is 2100 UTC GS is 441 kt TAS is 491 kt At 2010 UTC, ATC requests a speed reduction to cross the meridian at 2105 UTC. The reduction to TAS will be approximately:
A) 60 kt.
B) 75 kt.
C) 40 kt.
D) 90 kt.

An aircraft at 66° N 029° W obtains a bearing of 141° (relative) from an NDB at 64° N 022° W. The aircraft is heading 352° M and the variation is 15° W. The bearing to plot from the NDB on a Lamberts chart with a parallel of origin at 51° N is:
A) 298° (T)
B) 303.4° (T)
C) 333.4° (T)
D) 293.6° (T)

Please refer to chart E(LO)1.
What is the approximate course (T) and distance between Waterford NDB (WTD, 5212N 00705W) and Sligo NDB (SLG, 5417N 00836W)?
A) 344 139 nm.
B) 156 136 nm.
C) 336 137 nm.
D) 164 138 nm.

(Refer to Jeppesen Manual chart E(LO)1A)
An aircraft is at KLONN (N58° 23.5 E002° 49.7) at 1038 UTC, FL90, groundspeed 190 kts and routing via B2D to ADN. The ADN VOR should be received at time:
A) 1108 UTC.
B) 1056 UTC.
C) 1102 UTC.
D) 1133 UTC.

TT from A to B is 167° , and the distance is 140 NM. Variation is 12W at A and 14W at B You flight-plan WCA 8L. When the remaining distance to B is 35 NM you find that your position is 5 NM right of the flight plan track. Since over A you have steered as flight planned. What change of heading is required at this time to bring you directly to B?
A) 3° left.
B) 11° left.
C) 14° left.
D) 8° left.

An aircraft using navigation techniques, departs from 70° N 060° E on an initial great circle track of 090° (T). If the grid being used is aligned with the Greenwich Meridian, determine the aircrafts track(° G).
A) 150° (G)
B) 330° (G)
C) 030° (G)
D) 210° (G)

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61. An aircraft at FL140, IAS 210 kt, OAT -5° C and wind component minus 35 kt, is required to reduce speed in order to cross a reporting point 5 MIN later than planned. Assuming that flight conditions do not change, when 150 NM from the reporting point the IAS should be reduced by:
A) 20 kt.
B) 30 kt.
C) 15 kt.
D) 25 kt.

An aircraft obtains a relative bearing of 315° from an NDB at 0830. At 0840 the relative bearing from the same position is 270° . Assuming no drift and a GS of 240 kt, what is the approximate range from the NDB at 0840?
A) 50 NM
B) 30 NM
C) 60 NM
D) 40 NM

Given: Distance A to B is 475 NM, Planned GS 315 kt, ATD 1000 UTC, 1040 UTC - fix obtained 190 NM along track. What GS must be maintained from the fix in order to achieve planned ETA at B?
A) 320 kt.
B) 360 kt.
C) 340 kt.
D) 300 kt.

Given: Distance A to B = 120 NM, After 30 NM aircraft is 3 NM to the left of course. What heading alteration should be made in order to arrive at point B?
A) 6° right.
B) 8° left.
C) 4° right.
D) 8° right.

You are flying from A(30S 20E) to B (30S 20E). What is the final GC track?
A) 300° (T)
B) 250° (T)
C) 280° (T)
D) 270° (T)

TT from A to B is 167° , and the distance is 140 NM. Variation is 12W at A and 14W at B You flight-plan WCA 8L. When the remaining distance to B is 35 NM you notice that your position is 5 NM right of the flight plan track. Since over A you have steered as flight planned. What has the drift been since you were overhead A?
A) 10,8 R
B) 12,2 R
C) 5,6 R
D) 2,9 R

When flying from A to B, a distance of 120NM, you are 3nm left of track after 30NM. What is the required alteration of heading to make good B?
A) 6° right.
B) 4° right.
C) 8° left.
D) 8° right.

Flight Log:

(Refer to Jeppesen Manual chart E(LO)1)
ISY DME (N55° 41.0 W006° 15.0) 60 NM.
TIR DME (N56° 29.6 W006° 52.6) 37 NM.
The position of the aircraft is:
A) 56° 20N 007° 40W
B) 56° 05N 007° 55W
C) 56° 00N 008° 00W
D) 56° 10N 007° 50W

Please refer to chart E(LO)1.
The airport at 5211N 00932W is:
A) Shannon..
B) Cork.
C) Kerry.
D) Waterford.

You are heading 345M, the variation is 20E, and you take a radar bearing of 30 left of the nose from an island. What bearing do you plot?
A) 180T.
B) 160T.
C) 140T.
D) 155T.

'Please refer to chart E(LO)1.
What is at 5211N 00932W?
A) Cork Airport.
B) Kerry Airport.
C) Waterford NDB.
D) Kerry VOR.

The flight log gives the following data: True track, Drift, True heading, Magnetic variation, Magnetic heading, Compass deviation, Compass heading. The right solution, in the same order, is:
A) 125° , 2° R, 123° , 2° W, 121° , -4° , 117°
B) 117° , 4° L, 121° , 1° E, 122° , -3° , 119°
C) 119° , 3° L, 122° , 2° E, 120° , +4° , 116°
D) 115° , 5° R, 120° , 3° W, 123° , +2° , 121°

Purposes of (FMS)Flight management system:

Please refer to chart E(LO)1.
What are the symbols at Galway Carnmore (5318.1N 00856.5W)?
A) VOR, NDB, DME, compulsory reporting point.
B) Civil airport, NDB, DME, non-compulsory reporting point.
C) Civil airport, VOR, DME, non-compulsory reporting point.
D) VOR, NDB, DME, non-compulsory reporting point.

An aeroplanes flies from A (59° S 142W) to B (61° S 148W) with a TAS of 480 kt.
The autopilot is engaged and coupled with an Inertial Navigation System in which AB track is active. On route AB, true track:
A) varies by 10°
B) decreases by 6°
C) increases by 5°
D) varies by 4°

What are, in order of highest priority followed by lowest, the two levels of message produced by the CDU of the B737-400 Electronic Flight Instrument System?
A) Priority and Alerting.
B) Alerting and Advisory.
C) Urgent and Advisory.
D) Urgent and Routine.

What indication, if any, is given in the B737-400 Flight Management System if radio updating is not available?
A) No indication is given so long as the IRS positions remain within limits.
B) A warning message is displayed on the Flight Director System.
C) A warning message is displayed on the IRS displays.
D) A warning message is displayed on the EHSI and MFDU.

Which component of the B737-400 Flight Management System (FMS) is used to enter flight plan routeing and performance parameters?
A) Inertial Reference System.
B) Flight Director System.
C) Multi-Function Control Display Unit.
D) Flight Management Computer.

Which of the following can all be stored as five letter waypoint identifiers through the CDU of a B737-400 Electronic Flight Instrument System?
A) Waypoint names; navaid frequencies; runway codes; airport ICAO identifiers.
B) Airway names; navaid identifiers; airport names; waypoint code numbers.
C) Waypoint names; navaid identifiers; runway numbers; airport ICAO identifiers.
D) Waypoint names; navaid positions; airport ICAO identifiers; airport names.

What are the levels of message on the Boeing 737-400 FMC?
A) Urgent and Advisory.
B) Priority and Alerting.
C) Urgent and Routine.
D) Alert and Advisory.

Checking and entering the necessary data in the FMS on each pre-flight page is done by:
A) Pushing the lower right line select key.
B) Pushing the menu key.
C) Pushing the init ref key.
D) Pushing the lower left line select key.

Which of the following lists the first three pages of the FMC/CDU normally used to enter data on initial start-up of the B737-400 Electronic Flight Instrument System?
A) POS INIT - RTE - DEPARTURE.
B) IDENT - RTE - DEPARTURE.
C) IDENT - POS INIT - RTE.
D) POS INIT - RTE - IDENT.

The purpose of the Flight Management System (FMS), as for example installed in the B737-400, is to provide:
A) continuous automatic navigation guidance and performance management.
B) continuous automatic navigation guidance as well as manual performance management.
C) manual navigation guidance and automatic performance management.
D) both manual navigation guidance and performance management.

What is the validity period of the permanent data base of aeronautical information stored in the FMC In the B737-400 Flight Management System?
A) 3 calendar months.
B) One calendar month.
C) 28 days.
D) 14 days.

With LNAV and VNAV disengaged the B737 CDU displays:
A) Allows the crew to fly the selected profile manually or by conventional autopilot modes.
B) Allows the crew to predict what ifs on flight plan options and provide new calculations on actual data
C) Allow the crew to monitor proper FMS operation and flight progress.
D) Allow the FMC full automatic control of the aircraft.

Given: Distance A to B is 325 NM, Planned GS 315 kt, ATD 1130 UTC, 1205 UTC - fix obtained 165 NM along track. What GS must be maintained from the fix in order to achieve planned ETA at B?
A) 355 kt.
B) 375 kt.
C) 335 kt.
D) 395 kt.

Which FMC/CDU page normally appears on initial power application to the B737-400 Electronic Flight Instrument System?
A) INITIAL.
B) POS INIT.
C) PERF INIT.
D) IDENT.

An aeroplane flies from A (59° S 142° W) to B (61° S 148° W) with a TAS of 480 kt. The autopilot is engaged and coupled with an Inertial Navigation System in which AB track is active. On route AB, the true track:
A) decreases by 6° .
B) increases by 5° .
C) varies by 10° .
D) varies by 4° .

Dashes on an FMS CDU indicate:
A) That the system is warming up.
B) The system is ready for operation.
C) That the power has failed to the system.
D) That data entry is required by the system.

The Flight management System consists of the following major units:
A) the flight management unit and a VOR/DME computerised receiver unit.
B) the Command and display unit and a flight-planning computer.
C) the Command display unit and an INS unit.
D) the Flight management computer and the Command display unit.

For an FMS if a SID has to be entered into the route the:
A) RTE key is pushed.
B) PROG key is pushed.
C) CLB key is pushed.
D) DEP/ARR key is pushed.

For an FMS, when the TAKE OFF REF page is reached, it displays:
A) PERF INIT in confirmation that all required pre-flight entries have been made.
B) TAKE-OFF in confirmation that all required pre-flight entries have been made,
C) PRE-FLT COMPLETE in confirmation that all required pre-flight entries have been made.
D) ACT RTE in confirmation that all required pre-flight entries have been made.

VNAV mode will disengage:
A) If the MCP altitude is set before reaching the FMC cruise altitude.
B) If the MCP altitude is intercepted before reaching the FMC cruise altitude.
C) If the MCP altitude is set after reaching the FMC cruise altitude.
D) If the MCP altitude is intercepted after reaching the FMC cruise altitude.

The FMC normally has 3 different types of memory:
A) Bubble memory, DATA and PROM.
B) Bubble memory, RAM and PROM DATA.
C) Bubble memory, RAM and PROM.
D) Bubble memory, RAM and DATA.

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21. How is the radio position determined by the FMC in the B737-400 Electronic Flight Instrument System?
A) VOR/DME range and bearing.
B) DME/DME or VOR/DME.
C) DME ranges and/ or VOR/ADF bearings.
D) DME/DME.

How many navigational databases are there in an FMC:
A) 2 active.
B) 2 inactive.
C) 2 active, 2 inactive
D) 1 active, 1 inactive.

A typical FMS installation consists of 2 EFIS and 2 CDU. When the FMC switch is placed in the ALTN position:
A) the EFIS displays will shift between the 2 FMCs every 30 seconds.
B) the pilot will be presented with an alternative picture on his EFIS at the interval he selects.
C) alternative sources of data are used to supply data to the FMC.
D) the related CDU and EFIS displays will be connected to the other computer.

On the B737 FMC the FAIL light when illuminated indicates:
A) That both FMCs have a total power failure.
B) That the FMC test is in progress.
C) That the relevant pilots FMC has a total power failure.
D) That no IRS information is being automatically fed to the relevant FMC.

In which of the following situations is the FMC present position of a B737-400 Electronic Flight Instrument System likely to be least accurate?
A) At top of climb.
B) At top of descent.
C) Just after take-off.
D) On final approach.

An aircraft is flying with aid of an inertial navigation system (INS) connected to the autopilot. The following two points have been entered in the INS computer:
WPT 1: 60° N 030W
WPT 2: 60° N 020° W
When 025° W is passed the latitude shown on the display unit of the inertial navigation system will be:
A) 60° 05.7
B) 60° 11.0N
C) 60° 00.0N
D) 59° 49.0N

For an FMS, during pre-flight:
A) Information from the flight plan and navigation database is entered into the CDU.
B) Information from the navigation database and load sheet is entered into the CDU.
C) Information from the flight plan and load sheet and navigation database is entered into the CDU.
D) Information from the flight plan and load sheet is entered into the CDU.

Which of the following lists all the methods that can be used to enter Created Waypoints into the CDU of a B737-400 Electronic Flight Instrument System?
A) Identifier bearing/distance; place bearing/place distance; along/across-track displacement; latitude and longitude.
B) Identifier bearing/distance; place distance/place distance; along-track displacement; latitude and longitude.
C) Identifier bearing/distance; place bearing/place bearing; along-track displacement; latitude and longitude.
D) Identifier bearing/distance; place bearing/place bearing; latitude and longitude; waypoint name.

In the B737-400 Flight Management System the CDUs are used during pre-flight to:
A) manually initialize the IRSs and FMC with dispatch information.
B) automatically initialize the IRSs and FMC with dispatch information.
C) manually initialize the Flight Director System and FMC with dispatch information.
D) manually initialize the IRSs, FMC and Autothrottle with dispatch information.

Inertial Navigation System (INS)
Principles and Practical Application:

The resultant of the first integration from the north/south accelerometer of an inertial navigation system (INS) in the NAV MODE is:
A) latitude.
B) velocity along the local meridian.
C) groundspeed.
D) change latitude.

An INS platform is kept at right angles to local gravity by applying corrections for the effects of:

i. Aircraft manoeuvres
ii. earth rotation
iii. transport wander
iv. Coriolis
v. gyroscopic inertia

A) ii, iii and v
B) i, iii and v
C) ii, iii and iv
D) ii, iv and v

IRS differs from INS in that it:
A) has a shorter spin-up time and suffers from laser lock.
B) does not need to correct for Coriolis and central acceleration.
C) has a longer spin-up time and is not affected by vertical accelerations due to gravity.
D) does not experience Schuler errors as accelerometers are strapped down and are not rotated by a V/R feedback loop.

In an IRS:
A) accelerometers and platform are both gyro-stabilised.
B) accelerometers and platform are both strapped down.
C) the platform is strapped down but the accelerometers are gyro-stabilised.
D) the accelerometers are strapped down but the platform is gyro stabilised.

The principle of Schuler Tuning as applied to the operation of Inertial Navigation Systems Inertial Reference Systems is applicable to:
A) only to strapdown laser gyro systems.
B) both gyro-stabilised platform and strapdown systems.
C) only gyro-stabilised systems.
D) both gyro-stabilised and laser gyro systems but only when operating in the non strapdown mode.

In order to maintain an accurate vertical using a pendulous system, an aircraft inertial platform incorporates a device:
A) with damping and a period of 84.4 MIN.
B) with damping and a period of 84.4 SEC.
C) without damping and a period of 84.4 SEC.
D) without damping and a period of 84.4 MIN.

One of the errors inherent in a ring laser gyroscope occurs at low input rotation rates tending towards zero when a phenomenon known as lock-in is experienced. What is the name of the technique, effected by means of a piezo-electric motor, that is used to correct this error?
A) Cavity rotation.
B) Zero drop.
C) Beam lock.
D) Dither.

Some inertial reference and navigation systems are known as strapdown. This means that:
A) the gyroscopes and accelerometers become part of the units fixture to the aircraft structure.
B) gyros and accelerometers need satellite information input to obtain a vertical reference.
C) only the gyros ,and not the accelerometers, become part of the units fixture to the aircraft structure.
D) gyros, and accelerometers are mounted on a stabilised platform in the aircraft.

What additional information is required to be input to an Inertial Navigation System (INS) in order to obtain an W/V readout?
A) Mach Number.
B) TAS.
C) Altitude and OAT.
D) IAS.

What measurement is used to carry out alignment of an Inertial Navigation System?
A) Difference in magnitude of the value of gravity compared with the gravity at the last known position.
B) Acceleration sensed by the north gyro horizontal accelerometer.
C) Acceleration sensed by the east gyro horizontal accelerometer.
D) Acceleration sensed by the north gyro vertical accelerometer.

What is the axis of gyro drift?
A) Horizontal.
B) Vertical and horizontal.
C) Vertical.
D) Longitudinal.

What do you call a system of gyros and accelerometers which is fixed to the aircraft?
A) Strapdown.
B) Gyro-stabilised platform.
C) Laser.
D) Fixed.

Laser lock is overcome in an IRS system by using a piezo-electric motor which utilises the principle of:
A) dither.
B) SAGNAC.
C) vibration.
D) shake.

An Inertial Navigation System, what is the output of the first stage North/South integrator?
A) Latitude.
B) Velocity along the local meridian.
C) Groundspeed.
D) Change of latitude.

The resultant of the first integration of the output from the east/west accelerometer of an inertial navigation system (INS) in NAV MODE is:
A) change of longitude.
B) vehicle longitude.
C) departure.
D) velocity along the local parallel of latitude.

The term drift refers to the wander of the axis of a gyro in:
A) the vertical and horizontal plane.
B) the horizontal plane.
C) the vertical plane.
D) any plane.

Some inertial reference systems are known as strapdown. This means:
A) the system is mounted on a stabilised platform.
B) the accelerometers are fixed but the gyros are stabilised.
C) the system is mounted and fixed to the aircraft structure.
D) the gyros are fixed but the accelerometers are stabilised.

In an Inertial Navigation System (INS), Ground Speed (GS) is calculated:
A) by integrating measured acceleration.
B) from TAS and W/V from RNAV data.
C) by integrating gyro precession in N/S and E/W directions respectively.
D) from TAS and W/V from Air Data Computer (ADC).

In what plane is gyro wander known as drift?
A) Neither - it is a separate phenomenon.
B) Vertical.
C) Horizontal.
D) Horizontal and vertical.

In a ring laser gyro, the purpose of the dither motor is to:
A) enhance the accuracy of the gyro at all rotational rates.
B) compensate for transport wander.
C) stabilise the laser frequencies.
D) overcome laser lock.

---

21. In a strap down INS the accelerometers are oriented with their axes:
A) along yaw, longitudinal and lateral axis of the aircraft.
B) with the local vertical, True North and True East.
C) with the local horizontal plane, The aircraft lateral axis and True North/South.
D) with the lateral axis of the aircraft, True North/South and True East/West.

The alignment time, at mid-latitudes, for an Inertial Navigation System using gimballed gyros is approximately:
A) 20 MIN.
B) 5 MIN.
C) 30 MIN.
D) 10 MIN.

With reference to inertial navigation systems, a TAS input is:
A) required for rhumb line navigation.
B) not required.
C) required to provide a W/V read out.
D) required for Polar navigation.

What does the sensor of an INS/IRS measure?
A) Velocity.
B) Horizontal Earth Rate.
C) Acceleration.
D) Precession.

What is the name given to an Inertial Reference System (IRS) which has the gyros and accelerometers as part of the units fixture to the aircraft structure?
A) Ring laser.
B) Solid state.
C) Strapdown.
D) Rigid.

Few modern INS systems use a mechanically stabilised platform and mechanical gyros. These components has been replaced by:
A) a combination of rate gyros and True North gyros.
B) rotating accelerometers and analogue computers.
C) strap down Ring laser gyros and accelerometers plus advanced digital computers.
D) a digital horizon and gyrosyn true-reading compass.

Which of the following statements is correct concerning Ring Laser Gyros?
A) They are not necessarily fixed to true north and are quick to erect.
B) Their alignment will be either with true north or the local vertical.
C) They do not suffer from lock-in and are unaffected by the Earths gravitational force.
D) They are not necessarily fixed to true north but take a long time to erect.

For an electronic display system, amber is used for:
A) Abnormal sources or cautions.
B) Warnings or flight envelope and systems limits.
C) Engaged modes.
D) Earth.

Double integration of the output from the east/west accelerometer of an inertial navigation system (INS) in the NAV MODE give:
A) distance east/west.
B) distance north/south.
C) velocity east/west.
D) vehicle longitude.

Alignment Procedures:

A pilot accidentally turning OFF the INS in flight, and then turns it back ON a few moments later. Following this incident:
A) everything returns to normal and is usable.
B) no useful information can be obtained from the INS.
C) the INS is usable in NAV MODE after a position update.
D) it can only be used for attitude reference.

Alignment of INS and IRS equipments can take place in which of the following modes?
A) NAV and ATT.
B) ATT and ALIGN.
C) ALIGN and ATT
D) NAV and ALIGN.

Alignment of INS and IRS equipment can take place in which of the following modes?
A) ALIGN and ATT.
B) NAV and ATT.
C) ALIGN only.
D) NAV and ALIGN.

When initial position is put into an FMS, the system:
A) cannot detect input errors, and accepts whatever is put in.
B) rejects initial longitude error, but it will accept latitude error.
C) rejects initial latitude error, but it will accept longitude error.
D) rejects initial latitude or longitude error.

Which of the following statements concerning the alignment procedure for Inertial Navigation Systems(INS)/Inertial Reference Systems (IRS) at mid-latitudes is correct?
A) INS/IRS can be aligned in either the ALIGN or ATT mode.
B) INS/IRS can only be aligned in NAV mode.
C) INS/IRS can be aligned in either the ALIGN or NAV mode.
D) INS/IRS can only be aligned in the ALIGN mode.

How long does alignment of an IRS (Laser Ring Gyros) normally take at mid-latitudes?
A) 5 minutes.
B) 2 minutes.
C) 7 minutes.
D) 10 minutes.

When and where are IRS positions updated?
A) During all phases of flight.
B) Only on the ground during the alignment procedure.
C) When the FMS is in IRS ONLY NAV operation.
D) When the VHF Nav Radios are selected to AUTO.

During initial alignment an inertial navigation system is north aligned by inputs from:
A) computer matching of measured gravity magnitude to gravity magnitude of initial alignment.
B) the aircraft remote reading compass system.
C) vertical accelerometers and the north gyro.
D) horizontal accelerometers and the east gyro.

Which of the following statements concerning the aircraft positions indicated on a triple fit Inertial Navigation System (INS)/ Inertial Reference System (IRS) on the CDU is correct?
A) The positions will be the same because they are an average of three different positions.
B) The positions will only differ if an error has been made when inputting the present position at the departure airport.
C) The positions are likely to differ because they are calculated from different sources.
D) The positions will only differ if one of the systems has been decoupled because of a detected malfunction.

On an IRS the modes available on the MCP are:
A) OFF - ALIGN - NAV - ATT.
B) OFF - STBY - ALIGN - ATT.
C) OFF - ALIGN - NAV - STBY.
D) OFF - STBY - ALIGN - NAV.

After alignment, is it possible to update IRS positions?
A) Yes - by operation of the TO/GA switch, the runway threshold co-ordinates are inserted into the IRS.
B) Yes, the pilots can insert updates.
C) Yes, the process is automatic in flight from the DME' s.
D) No.

Which of the following statements concerning the loss of alignment by an Inertial Reference System (IRS) in flight is correct?
A) It is not usable in any mode and must be shut down for the rest of the flight.
B) The mode selector has to be rotated to ATT then back through ALIGN to NAV in order to obtain an in-flight realignment.
C) The navigation mode, including present position and ground speed outputs, is inoperative for the remainder of the flight.
D) The IRS has to be coupled to the remaining serviceable system and a realignment carried out in flight.

The alignment time, at mid-latitudes, for an Inertial Reference System using laser ring gyros is approximately:
A) 10 MIN.
B) 5 MIN.
C) 20 MIN.
D) 2 MIN.

During the initial alignment of an inertial navigation system (INS) the equipment:
A) will accept a 10° error in initial latitude and initial longitude.
B) will not accept a 10° error in initial latitude or initial longitude.
C) will not accept a 10° error in initial latitude but will accept a 10° error in initial longitude.
D) will accept a 10° error in initial latitude but will not accept a 10° error in initial longitude.

Which of the following statement is correct concerning gyro-compassing of an inertial navigation system (INS)?
A) Gyro-compassing of an INS is not possible in flight because it can differentiate between movement induced and misalignment induced accelerations.
B) Gyro-compassing of an INS is not possible in flight because it cannot differentiate between movement induced and misalignment induced accelerations.
C) Gyro-compassing of an INS is possible in flight because it cannot differentiate between movement induced and misalignment induced accelerations.
D) Gyro-compassing of an INS is possible in flight because it can differentiate between movement induced and misalignment induced accelerations.

The alignment time, at mid-latitudes, for an Inertial Navigation System using gimballed gyros is approximately:
A) 5 MIN.
B) 20 MIN.
C) 30 MIN.
D) 10 MIN.

Accuracy, reliability, errors and coverage of INSIRS:

The drift of the azimuth gyro on an inertial unit induces an error in the position given by this unit. T being the elapsed time. The total error is:

A) sinusoidal.
B) proportional to t.
C) proportional to the square of time, t^2.
D) proportional to t/2.

In an INS / IRS, an azimuth gyro is found to have a drift rate. If t is the time since selecting the MSU from ALIGN to NAV, is the azimuth gyro heading error:

A) proportional to 1/t.
B) proportional to sqrt(t).
C) proportional to t.
D) sinusoidal.

Which of the following lists, which compares an Inertial Reference System that utilises Ring Laser Gyroscopes (RLG) instead of conventional gyroscopes, is completely correct?

A) There is little or no spin up time and it does not suffer from lock in error.
B) There is little or no spin up time and it is insensitive to gravitational (g) forces.
C) It does not suffer from lock in error and it is insensitive to gravitational (g) forces.
D) The platform is kept stable relative to the earth mathematically rather than mechanically but it has a longer spin up time.

The azimuth gyro of an inertial unit has a drift of 0.01° /HR. After a flight of 12 HR with a ground speed of 500 kt, the error on the aeroplane position is approximately:

A) 1 NM.
B) 12 NM.
C) 60 NM.
D) 6 NM.

The platform of an inertial navigation system (INS) is maintained at rights angles to the local vertical by applying corrections for the effects of:

A) aircraft manoeuvres, earth rotation, transport wander and Coriolis
B) movement in the yawing plane, secondary precession and pendulous oscillation
C) vertical velocities, earth precession, centrifugal forces and transport drift
D) gyroscopic inertia, earth precession and pendulous oscillation

Flight deck equipment and operation:

An aircraft equipped with an Inertial Navigation System (INS) flies with INS 1 coupled with autopilot 1. Both inertial navigation systems are navigating from way-point A to B. The inertial systems Central Display Units (CDU) shows: - XTK on INS 1 = 0 - XTK on INS 2 = 8L (XTK = cross track). From this information it can be deduced that:
A) at least one of the inertial navigation systems is drifting.
B) the autopilot is unserviceable in NAV mode.
C) only inertial navigation system No. 1 is drifting.
D) only inertial navigation system No. 2 is drifting.

Gyrocompassing of an inertial reference system (IRS) is accomplished with the mode selector switched to:
A) ATT/REF.
B) ALIGN.
C) STBY.
D) ON.

With reference to an inertial navigation system (INS), the initial great circle track between computer inserted waypoints will be displayed when the control display unit (CDU) is selected to:
A) XTK/TKE.
B) DSRTK/STS.
C) TK/GS.
D) HDG/DA.

What method of entering waypoints can be used on all INS equipments?
A) Latitude and longitude.
B) Navaid identifier.
C) Distance and bearing.
D) Waypoint name.

Waypoints can be entered in an INS memory in different formats. In which of the following formats can waypoints be entered into all INS' s?
A) Hexadecimal.
B) Geographic coordinates.
C) Bearing and distance.
D) By waypoints name.

ATT Mode of the Inertial Reference System (IRS) is a back-up mode providing:
A) navigation information.
B) only attitude information.
C) altitude, heading and position information.
D) only attitude and heading information.

The period of validity of an FMS database is:
A) varies depending on the area of operational cover.
B) 28 days.
C) 56 days.
D) one week.

Aircraft position determined by radio navigation in an FMC is derived from:
A) VOR / DME.
B) DME ranges and / or VOR / ADF bearings.
C) VOR / ADF.
D) DME only.

Which of the following statements concerning the operation of an Inertial Navigation System (INS)/Inertial Reference System (IRS) is correct?
A) NAV mode must be selected when the alignment procedure is commenced.
B) NAV mode must be selected prior to movement of the aircraft off the gate.
C) NAV mode must be selected prior to the loading of passengers and/or freight.
D) NAV mode must be selected on the runway just prior to take-off.

When is the last point at which an INS or IRS may be selected to NAV mode?
A) On operation of the TOGA switch when opening the throttles for the take-off
B) After passengers and freight are aboard.
C) Immediately prior to push back or taxi from the gate.
D) At the holding point.

In the Boeing 737-400 FMS, the CDU is used to:
A) manually initialise the Flight Director System, FMC and Autothrottle with dispatch information.
B) automatically initialise the IRS and FMC with dispatch information.
C) manually initialise the Flight Director System and FMC with dispatch information.
D) manually initialise the IRS and FMC with dispatch information.

What are the positions (in the order left to right) on the Boeing 737-400 IRS MSU mode selector?
A) OFF ALIGN NAV ATT.
B) OFF ON ALIGN NAV.
C) OFF STBY ATT NAV.
D) OFF STBY ALIGN NAV.

On a triple-fit IRS system, present positions on the CDU:
A) will only differ if one IRS has been decoupled due to a detected malfunction.
B) are likely to differ as the information comes from different sources.
C) will only differ if an initial input error of aircraft position has been made.
D) will not differ as the information is averaged.

Which of the following can all be stored as five letter waypoint identifiers through the CDU of a B737- 400 Electronic Flight Instrument System?
A) Waypoint names; navaid frequencies; runway codes; airport ICAO identifiers.
B) Waypoint names; navaid positions; airport ICAO identifiers; airport names.
C) Airway names; navaid identifiers; airport names; waypoint code numbers.
D) Waypoint names; navaid identifiers; runway numbers; airport ICAO identifiers.

A pilot turns off the power to his IRS whilst in flight. If he switches the power back on after just a few seconds the effect will be:
A) there will be no effect and the IRS can continue to be used.
B) the IRS cannot be used for navigation but can be used to give attitude information.
C) the IRS cannot be used and should be shut down.
D) the IRS can be used providing the position is checked.

On the IRS, selection of ATT mode gives:
A) attitude and heading.
B) altitude, heading, and groundspeed.
C) altitude, attitude, and heading.
D) attitude information only.

Which of the following equipments does not use information from external sources in flight?
A) INS / IRS.
B) Slaved gyro compass.
C) Pressure altimeter.
D) VOR.

An INS, what is the output of the E/W second-stage integrator?
A) Distance E/W.
B) Velocity E/W.
C) Distance N/S.
D) Velocity N/S.

Which mode on the CDU of an INS must be selected in order to display initial Great Circle track?
A) XTK TKE
B) DSRTK STS
C) HDG DA
D) TK GS

Which is correct for INS/IRS?
A) NAV should be selected prior to passenger embarkation.
B) NAV should be selected once the alignment procedure is commenced.
C) NAV should be selected when lined up on the runway.
D) NAV should be selected prior to moving from the gate.

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21. If an INS is switched off, then on again in flight, which of the following applies?
A) You can carry on as before.
B) It will be usable after a position update.
C) It will be usable in ATT REF only.
D) It is unusable for the rest of the flight.

Which of the following statements concerning the aircraft positions indicated on a triple fit Inertial Navigation System (INS)/ Inertial Reference System (IRS) on the CDU is correct?
A) The positions will be the same because they are an average of three different positions.
B) The positions will only differ if an error has been made when inputting the present position at the departure airport.
C) The positions will only differ if one of the systems has been decoupled because of a detected malfunction.
D) The positions are likely to differ because they are calculated from different sources.

An aircraft equipped with an Inertial Navigation system (INS) flies with INS 1 coupled with autopilot 1. Both inertial navigation systems are navigating from waypoint A to B. The inertial systems CDU s show:
XTK on INS 1 = 0
XTK on INS 2 = 8L
From:
A) the autopilot is unserviceable in NAV mode.
B) at least one of the inertial navigation systems is drifting.
C) only inertial navigation No 1 is drifting.
D) only inertial navigation No 2 is drifting.

What can be used to enter positions on all INS systems?
A) Geographical co-ordinates.
B) Ranges and bearings.
C) Hexadecimals.
D) Waypoint names.

Which of the following correctly lists the order of available selections of the Mode Selector switches of an inertial reference system (IRS) mode panel?
A) OFF - ON - ALIGN - NAV.
B) OFF - ALIGN - ATT - NAV.
C) OFF - ALIGN - NAV - ATT.
D) OFF - STBY - ALIGN - NAV.

INS Operation:

The automatic flight control system (AFCS) in an aircraft is coupled to the guidance outputs from an inertial navigation system (INS) and the aircraft is flying from waypoint No. 2 (60° 00S 070° 00W) to No. 3 (60° 00S 080° 00W). Comparing the initial track (° T) at 070° 00W and the final track (° T) at 080° 00W, the difference between them is that the initial track is approximately:

A) 5° less than the final one.
B) 9° less than the final one.
C) 9° greater than the final one.
D) 5° greater than the final one.

The automatic flight control system (AFCS) in an aircraft is coupled to the guidance outputs from an inertial navigation system (INS). The aircraft is flying between inserted waypoints No. 3 (55° 00N 020° 00W) and No.4 (55° 00N 030° 00W). With DSRTK/STS selected on the CDU, to the nearest whole degree, the initial track read- out from waypoint No. 3 will be:

A) 270°
B) 278°
C) 274°
D) 266°

What is the source of magnetic variation information in a Flight Management System (FMS)?

A) Magnetic variation is calculated by each IRS based on the respective IRS position and the aircraft magnetic heading.
B) The main directional gyro which is coupled to the magnetic sensor (flux valve) positioned in the wingtip.
C) The FMS calculates MH and MT from the FMC position.
D) Magnetic variation information is stored in each IRS memory; it is applied to the true heading calculated by the respective IRS.

With the AFCS coupled to the INS outputs which latitudes give the greatest difference between the initial track readout and the mean track given in each case a difference in longitude of 10° ?

A) 60° N - 50° N.
B) 60° N - 60° N.
C) 30° S - 30° S.
D) 30° S - 25° S.

The sensors of an INS measure:

A) precession.
B) the horizontal component of the earths rotation.
C) velocity.
D) acceleration.

If an IRS fails in flight it can provide:

A) navigation information but not attitude information.
B) attitude and navigation information.
C) attitude and heading information
D) attitude information only.

Which of the following statements concerning the position indicated on the Inertial Reference System (IRS) display is correct?

A) The positions from the two IRSs are compared to obtain a best position which is displayed on the IRS.
B) It is updated when go-around is selected on take-off.
C) It is not updated once the IRS mode is set to NAV.
D) It is constantly updated from information obtained by the FMC.

An IRS is programmed with waypoint 1: N60° 00 W030° 00, waypoint 2:
N60° 00 W020° 00, waypoint 3: N60° 00 W010° 00. As the aircraft passes waypoint 2 its track will:
A) increase by 9° .
B) decrease by 9° .
C) increase by 4.5° .
D) not change.

An aircraft travels from point A to point B, using the autopilot connected to the aircrafts inertial system. The coordinates of A (45° S 010° W) and B (45° S 030° W) have been entered. The true course of the aircraft on its arrival at B, to the nearest degree, is:
A) 277°
B) 284°
C) 263°
D) 270°

An Inertial Navigation System is used to navigate an aircraft from waypoint 1 (45° N 030° W) to waypoint 2 (45° N 020° W). The DSRTK readout approaching waypoint 2 will be:
A) 090° T or 270° T depending on the coupling selection.
B) more than 090° T.
C) less than 090° T.
D) 090° T.

Which of the following statements concerning the operation of an Inertial Navigation System (INS)/Inertial Reference System (IRS) is correct?
A) NAV mode must be selected prior to the loading of passengers and/or freight.
B) NAV mode must be selected on the runway just prior to take-off.
C) NAV mode must be selected prior to movement of the aircraft off the gate.
D) NAV mode must be selected when the alignment procedure is commenced.

The automatic flight control system is coupled to the guidance outputs from an inertial navigation system. Which pair of latitudes will give the greatest difference between initial track read-out and the average true course given, in each case, a difference of longitude of 10° ?
A) 30° S to 30° N.
B) 60° N to 60° N.
C) 30° S to 25° S.
D) 60° N to 50° N.

What does the INS need for wind calculations?
A) EAS.
B) Mach Number.
C) CAS.
D) TAS.

In what formats can created waypoints be entered into the scratch pad of the B737 - 400 FMS?
A) Place, Place Bearing/Distance, Along-Track Displacement, Latitude and Longitude.
B) Place Bearing/Distance, Place Bearing/Place Bearing, Along-Track Displacement, Latitude and Longitude.
C) Place Bearing/Distance, Place Bearing/Place Bearing, Across-Track Displacement, Latitude and Longitude.
D) Place Bearing/Distance, Place Distance/Place Distance, Along-Track Displacement, Latitude and Longitude.

The following points are entered into an inertial navigation system (INS). WPT 1: 60° N 30° W WPT 2: 60° N 20° W WPT 3: 60° N 10° W The inertial navigation system is connected to the automatic pilot on route (1-2-3). The track change when passing WPT 2 will be approximately:
A) a 9° decrease.
B) a 4° decrease.
C) a 9° increase.
D) zero.

Gyro-compassing in an INS:
A) is possible in flight as the gyros can differentiate between acceleration due to aircraft movement and initial alignment errors.
B) is possible in flight as the gyros cannot differentiate between acceleration due to aircraft movement and initial alignment errors.
C) is not possible in flight as the gyros cannot differentiate between acceleration due to aircraft movement and initial alignment errors.
D) is not possible in flight as the gyros can differentiate between acceleration due to aircraft movement and initial alignment errors.

An aircraft is at FL140 with an IAS of 210 and a true OAT of -5C. The wind component is -35 knots. When the aircraft is at 150 nm from a reporting point, ATC request the crew to lose 5 minutes by the time they get to the beacon. How much do they need?
A) 15 knots.
B) 25 knots.
C) 30 knots.
D) 20 knots.

What is the sequence of pages on start-up of the Boeing 737 - 400 FMS?
A) IDENT, POS INIT, RTE.
B) POS INIT, RTE, IDENT.
C) POS INIT, IDENT, DEPARTURES.
D) IDENT, POS INIT, DEPARTURES.

Where and when are the IRS positions updated?
A) Only on the ground during the alignment procedure.
B) During flight IRS positions are automatically updated by the FMC.
C) Updating is normally carried out by the crew when over-flying a known position (VOR station or NDB).
D) IRS positions are updated by pressing the Take-off/Go-around button at the start of the take-off roll.

An inertial navigation system is used to navigate from waypoint 1 (45° N 030° W) to waypoint 2 (45° N 020° W). The distance flown will be:
A) more than 424.25 NM.
B) 424.25 NM.
C) approximately 600 NM.
D) less than 424.25 NM.

The automatic flight control system (AFCS) in an aircraft is coupled to the guidance outputs from an inertial navigation system (INS) and the aircraft is flying from waypoint 3 (35° S 050° W) to waypoint 4 (35° S 040° W). The initial track readout from waypoint 3 will be:
A) 090° .
B) more than 090° .
C) less than 090° .
D) more than 270° .