DOCUMENT
GSM-AUS-CPL.028

DOCUMENT TITLE

CPL NAVIGATION 2 (AUSTRALIA)

CHAPTER 11 – REVISION QUESTIONS

Version 2.1
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REVISION QUESTIONS

11.1 Revision Questions

1. Calculate the earliest UTC time at which a VFR flight could depart on 17 August from Sydney/Bankstown (S33° 56' E151°00').

2. Calculate the latest UTC time at which a VFR flight could plan to arrive at Melbourne/Moorabbin (S37°59'S E145°06') on 05 September. The TAF for Moorabbin shows INTER conditions that may require the aircraft to hold.

3. The "Representative Fraction" of a chart shows:
   a. Chart relief
   b. The type of projection
   c. The scale of the chart
   d. The type of radio information displayed.

4. A chart has a scale of 1 inch to 70 nautical miles.
   a. What is the scale of the chart?
   b. How many kilometres are represented by 7 centimetres?

5. On a Lambert's chart, which of the following lines would appear straight?
   a. Parallel of latitude 30°S
   b. A constant track direction 090°T
   c. Meridian 110°E
   d. Radio waves at all latitudes.

6. Which chart projection would be most suitable for a topographical map of Madagascar? Madagascar extends from 10°S to 25°S and from 44°E to 48°E.
   a. Normal Mercator
   b. Transverse Mercator
   c. Lambert's Conformal
   d. Polar Stereographic.

7. On a Transverse Mercator, how does scale vary?

   a. It does not vary because the chart is orthomorphic.

   b. Scale expands with increase in longitude.

   c. Scale contracts between the Standard Parallels and expands outside the Standard Parallels.

   d. Scale expands with increasing distance from the datum (central) meridian.

8. Jeppesen radio navigation charts, showing regions away from the equator, are based on the Lambert's Conformal, this projection is suitable because:

   a. Scale is constant.

   b. Rhumb lines show the path of radio waves and appear straight.

   c. Great circles are approximately straight lines on the Lambert's Conformal.

   d. The Lambert's Conformal is a large scale chart so extra detail can be shown.

9. An aircraft is flying between NDB Lima and VOR Mike along track 076°M. Heading has not been changed since the aircraft flew over NDB Lima. The following bearings are obtained:

   NDB LIMA: 172°R

   VOR MIKE: R261

   What is the new heading to track direct to VOR MIKE?

   a. 269°M

   b. 089°M

   c. 253°M

   d. 073°M.

10. An aircraft heading 327°M with TAS 150kts obtains the following nav-aid information:

    Time 0248 VOR/DME Mike 135° radial/93 nm

    Time 0300 VOR/DME Mike 135° radial/57 nm

    What wind velocity (°M) is affecting the flight?

11. You are planning a charter flight from Airport A to Airport D. The track passes Airport B and Airport C and you will only land at these airports if it is necessary to refuel. Calculate the minimum number of refuelling stops by referring to the following data:

Flight Details:

Fuel on Board:	215 litres useable at start-up
Start-up & Taxi Fuel:	5 litres
Fixed Reserves:	45 mins at 28 litres/hr
Variable Reserves:	As required
Cruise Fuel Flow:	45 litres/hr

Ignore Climb & Descent leg planning.

Route Details:

A to B = 270nm (Groundspeed 115kts)

B to C = 210nm (Groundspeed 125kts)

C to D = 180nm (Groundspeed 90kts)

Which one of the following statements is correct?

a. Fuel on board is sufficient for the flight from A to D and no refuelling is required.

b. You should plan to land and refuel at both B and C.

c. You should plan to land and refuel only at B and not C.

d. You should plan to land and refuel only at C and not B.

12. Which of the following flights would have the longest available period of daylight?

a. A flight to the North

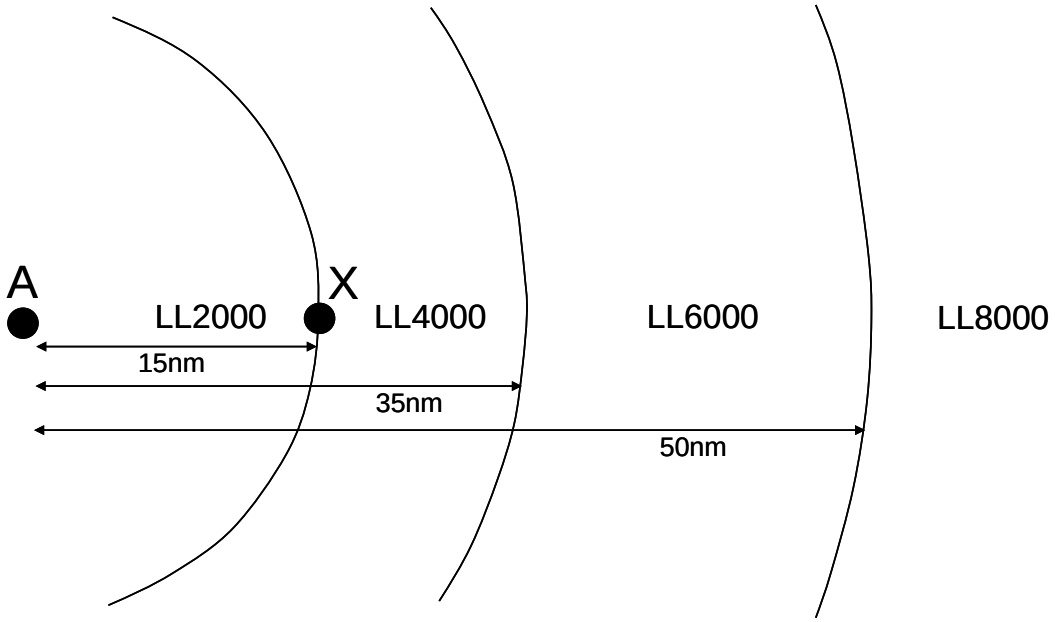
b. A flight to the South

c. A flight to the East

d. A flight to the West.

13. The diagram below represents the controlled airspace (CTA) steps centred on an aerodrome at “A”. The aircraft is currently at position “X” at A020, and is to climb at a constant rate to A075, remaining below controlled airspace (in class “G” airspace):

The rate of climb is 500 ft/min and the climb ground speed is 90kts.



13a. What is the minimum distance from “A” that a steady climb may be conducted to A075, remaining outside controlled airspace?

a. 38 nm

b. 42 nm

c. 27 nm

d. 32 nm.

13b. If the aircraft in the above diagram was to commence a climb from its present position, what is the maximum rate of climb that could be employed so as to ensure controlled airspace is not penetrated?

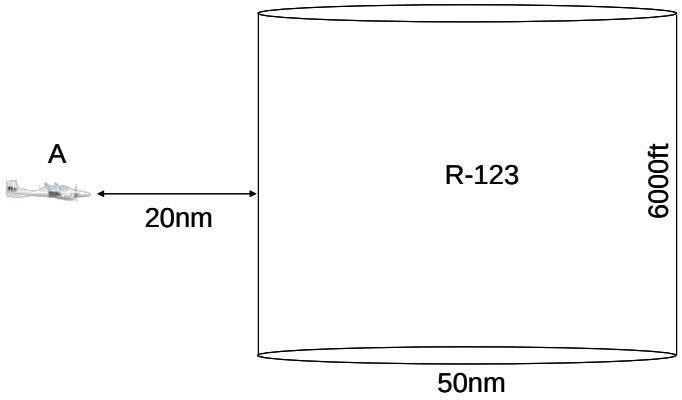
a. 250 fpm

b. 150 fpm

c. 350 fpm

d. 200 fpm.

14. An aircraft is at position “A” and cruising at A030. The climbing ground speed is 120kts. The minimum constant rate of climb on track to avoid penetrating restricted area R-123 would be:



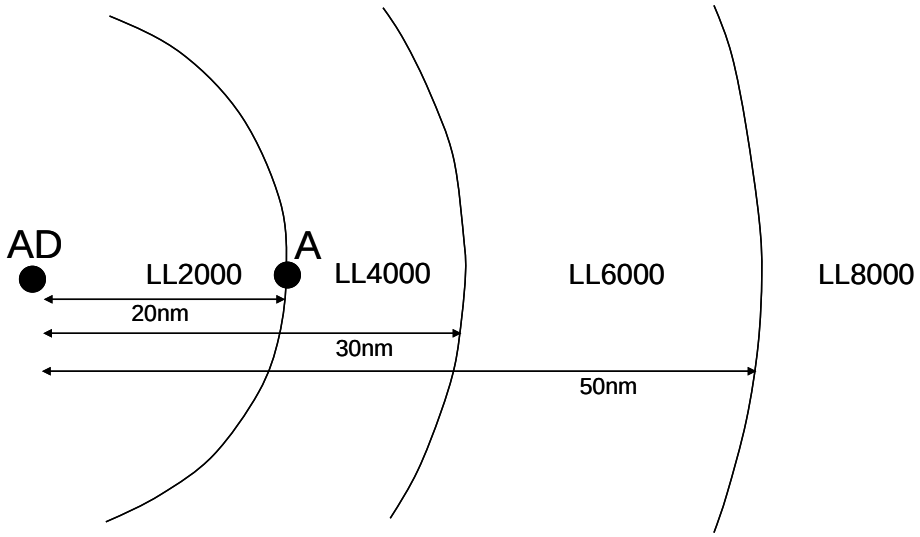
a. 200 fpm

b. 250 fpm

c. 350 fpm

d. 300 fpm.

15. The diagram below shows the controlled airspace steps from an aerodrome “AD”. The aircraft is at position “A” at 4100 ft amsl. The climbing ground speed is 120kts. The minimum rate of climb required from this position to 9000 ft amsl and still remaining within controlled airspace, is:



a. 380 fpm

b. 480 fpm

c. 300 fpm

d. 400 fpm.

16. You plan to arrive at Parkes thirty minutes before the end of daylight on 31 August. Last light at Parkes on 31 August is:

    a. 311806UTC

    b. 311836UTC

    c. 310843UTC

    d. 310813UTC.

17. Which place would have the latest LMT of end of daylight on 22 December?

    a. Balikbapan (S01°16' E116°54')

    b. Havana (N23°08' W082°23')

    c. Tzaneen (S23°50' E030°10')

    d. Buenos Aires (S34°34' W058°25').

18. You are planning a VFR flight on 15 February from Broken Hill (S32°00' E141°28') to Port Lincoln (S34°36' E135°53'). Port Lincoln requires an alternate and you nominate Adelaide (S34°57' E138°32'). Adelaide requires 20 minutes holding.

    Flight times are as follows:

    Broken Hill to Port Lincoln: 02 hours 05 minutes

    Port Lincoln to Adelaide: 45 minutes

    Calculate the latest time of departure from Broken Hill in accordance with visual flight rules.

    a. 150715UTC

    b. 150625UTC

    c. 150645UTC

    d. 150700UTC.

19. The shortest track distance between A (S35° E100°) and B (S35° E110°) is defined by:

    a. A great circle

    b. A rhumb line

    c. The 35°S parallel of latitude

    d. A constant track of 090°T.

20. The scale of a map refers to the:

a. Amount of detail that can be shown

b. Size of the sheet of paper on which the map is printed

c. Amount of earth area that shown on the map

d. Ratio of chart distance to the earth distance that the chart distance represents.

21. The term “orthomorphism” is used to describe chart which:

a. Show equal areas of the earth as equal areas on the chart

b. Have constant scale

c. Show shapes of large areas correctly

d. Have the same scale North-South and East-West about any point.

22. The term “relief” when applied to a map refers to:

a. The means used to show scale

b. The coverage of the chart in latitude and longitude

c. How the elevation of the ground is shown

d. Topographical features, such as rivers, coastlines and lakes.

23. A Lamberts chart has standard parallels at 26°S and 38°S. The chart is shown to have a scale of 1: 5,000,000. Which of the following could be the scale at 32°S?

a. 1: 4,400,000

b. 1: 5,000,000

c. 1: 4,000,000

d. 1: 5,600,000.

24. Which one of the following statements is true regarding the Lamberts Conformal Conic Projection?

a. Scale is constant

b. Meridians are parallel straight lines and parallels of latitude are curved, concave to the nearer pole

c. All straight lines very closely approximate great circles

d. All straight lines represent rhumb lines.

25. You fly outbound from a VOR on R270. How would your track be drawn on a Lambert's chart?

a. Approximately as a straight line

b. Curved, concave to the nearer pole

c. Since you are flying along a parallel of latitude, the track would be curved

d. Curved, concave to the equator.

26. The Jeppesen chart A/S (H/L) 3 is based on a Normal Mercator projection. This projection is suitable for radio navigation because:

a. Radio waves follow the rhumb line track and will appear as straight lines on this chart.

b. The area of coverage is equatorial, so great circles will approximate straight lines on the chart.

c. Scale is constant.

d. It is not orthomorphic.

27. On a Normal Mercator, how does the graticule appear?

a. Parallels of latitude are curved, concave to the nearer pole and meridians appear as parallel straight lines.

b. Meridians converge towards the poles and parallels of latitude are shown as straight lines.

c. Parallels of latitude are curved, so meridians are also curved, cutting the parallels at 90°.

d. Meridians are straight and parallels lines, parallels of latitude are straight lines and parallel to the equator.

28. On a Normal Mercator, how does scale vary?

a. Scale expands outside the standard parallels and contracts between the standard parallels.

b. Scale is constant.

c. Scale expands with increase in latitude.

d. Scale expands North of the equator and contracts South of the equator.

29. For which purpose would the Normal Mercator be a suitable projection?

a. A radio navigation chart, covering the whole of Australia.

b. A plotting chart for the Polar Regions.

c. A meteorological chart for high latitudes.

d. A topographical chart for equatorial regions.

30. For which purpose would the Transverse Mercator be a suitable projection?

a. A topographical chart for equatorial regions.

b. A radio navigation chart for an East-West track across the Pacific Ocean.

c. A map of a country which covers a large area North-South and small area East-West.

d. A small scale plotting chart covering the Indian Ocean.

31. Which one of the following statements is true regarding the Transverse Mercator?

a. Equal areas on the earth will appear equal on the chart, as the Transverse Mercator has constant scale.

b. Shapes and areas are approximately correct within a band of 300nm either side of the datum meridian.

c. The chart is not orthomorphic, as the meridians and parallels of latitude do not intersect at 90°.

d. Meridians on the chart are depicted by parallel straight lines, equally spaced.

32. An aircraft obtains a DME reading of 10nm and you calculate the ground range to be 8nm. What will the DME readout be as the aircraft passes over the transmitter?

a. 10nm

b. 6nm

c. 8nm

d. 0nm.

33. An aircraft obtains a DME reading of 10nm and you calculate the ground range to be 8nm. At what DME range will the aircraft leave the rated coverage area?

a. 150nm

b. 180nm

c. 60nm

d. 90nm.

34. VOR measures magnetic bearing by:

a. Using loop and sense aerials

b. By comparing the phase of frequency and amplitude modulated components

c. Using secondary radar principles

d. By timing the difference between the reference and variable phase signals.

35. ADF can receive bearing indications from AM broadcast stations, which transmit in the:

a. VLF and LF bands

b. LF and MF bands

c. MF and HF bands

d. HF and VHF bands.

36. Which one of the following navigation aids may have reduced range at night?

a. NDB

b. VOR

c. DME

d. None of the above.

37. What information can DME display?

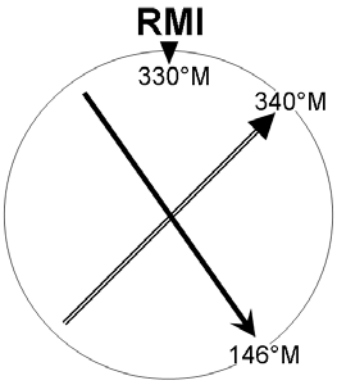
a. Range and bearing

b. Plan range and time-to-station

c. Slant range and ground speed

d. Bearing and time-to -station.

38. The RMI display shown below was obtained by an aircraft en-route between VOR A and VOR B. The direct track between A and B measures 332°M. The aircraft has maintained its present heading of 330°M since passing over VOR A.



What should the new heading be to track direct to VOR B?

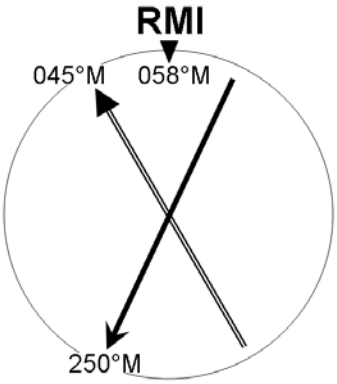
a. 344°M

b. 316°M

c. 340°M

d. 336°M.

39. You have maintained heading 058°M since passing overhead VOR L. The bearings to VOR L and VOR M are displayed on the RMI below:



What should the new heading be to track direct to VOR M?

a. 083°M

b. 045°M

c. 035°M

d. 033°M.

40. The aircraft heading is 343°M and a relative bearing of 027° is obtained to a NDB. What is the magnetic bearing to the NDB?

a. 010°M

b. 316°M

c. 190°M

d. 027°M.

41. You are flying at 2500ft above ground, when you are informed on the radio that D664 is currently closed to all air traffic due to a lost student pilot, doing a solo flight. What minimum rate of climb is required in order to pass over the area, if the area (D664) is 25nm ahead of you and groundspeed in the climb will be 120kts?

a. 400 ft/min

b. 300 ft/min

c. 200 ft/min

d. 100 ft/min.

42. Convert 250 litres into US Gallons:

a. 94 US Gal

b. 66 US Gal

c. 55 US Gal

d. 115 US Gal.

43. Convert 140 US Gallons into kilograms, if the specific gravity is 0.76:

a. 110 kg

b. 403 kg

c. 185 kg

d. 880 kg.

44. You are on final approach for runway 21L and the surface W/V is reported as 230°M at 30 kts. Calculate the cross-wind component.

a. 10 kts

b. 13 kts

c. 16 kts

d. 19 kts.

45. Compass heading is 357°C. Variation is 10°W, Drift is 12°R and Deviation is 4°E. What is the track made good?

a. 003°T

b. 013°T

c. 351°T

d. 015°T.

46. What is the rated coverage for the VOR at YBMA, if you are maintaining A065?

a. 60 nm at night

b. 100 nm by day

c. 60 nm

d. 90 nm.

47. What is the rated coverage for the NDB at YOOD, if you are maintaining A045?

a. 90 nm

b. 100 nm by day

c. 60 nm

d. 85 nm by night

48. What is the frequency of the Port Augusta AM Broadcast station?

a. 383 kHz

b. 1161 kHz

c. 765 kHz

d. 1242 kHz.

49. One nautical mile can be represented on the surface of the earth by:

a. One degree of longitude, at any latitude

b. One degree of latitude, at any longitude

c. One minute of latitude, at any longitude

d. One minute of longitude, at any latitude.

50. Calculate the TAS, if CAS is 105kts, A055 and OAT is +5°C.

a. 105 kts

b. 97 kts

c. 115 kts

d. 110 kts.

51. Calculate the CAS, if TAS is 125kts, A045 and OAT is +25°C.

a. 137 kts

b. 114 kts

c. 142 kts

d. 110 kts.

52. Aircraft TAS is 125kts, heading is 355°T and W/V is 320/30. Calculate the track and groundspeed.

a. 005°T & 102kts

b. 345°T & 100kts

c. 348°T & 102kts

d. 002°T & 98kts.

53. Refer to the VTC covering Launceston (TAZ). What is depicted by the purple shaded area, 10nm North-east of Launceston airfield?

a. It represents a hypsometric tint for elevation in excess of 7000ft elevation.

b. A restricted area.

c. An area where less than 500ft clearance exists between terrain and the CTA lower limit.

d. It represents a large mining operation or quarry, where frequent blasting prohibits overflying of the area.

54. Refer to ERC L2, covering the area between Swan Hill and Mildura, North-west of Melbourne. What is depicted by the brown shaded area between Swan Hill and Mildura?

a. It represents a hypsometric tint for elevation in excess of 7000ft elevation.

b. It represents an area of class C & D airspace, where the lower limit is below FL200.

c. An area where less than 500ft clearance exists between terrain and the CTA lower limit.

d. It represents an area of class E airspace, where the lower limit is below FL180.

55. Refer to the VTC covering Gold Coast (QLD). What is depicted by the dashed blue line around Gold Coast airfield?

a. It represents a class E airspace boundary.

b. It represents a recommended VFR route.

c. An area where less than 500ft clearance exists between terrain and the CTA lower limit.

d. It represents the border of class C & D control zone.

56. What is an Agonic line?

a. A line joining places with zero magnetic dip

b. A line joining places with equal magnetic dip

c. A line joining places with equal magnetic variation

d. A line joining places with zero magnetic variation.

57. Which combination of components of magnetic flux, best describes the composition of the earth's magnetic field across Australia?

a. Both horizontal and vertical components are similar and dip is at a maximum.

b. The vertical component is at a maximum and dip is at a minimum.

c. The horizontal component is at a maximum and dip is also at a maximum.

d. Both horizontal and vertical components are similar and dip is average.

58. The following points are plotted on a classroom globe representing the earth:

A = S25° E100° B = S35° E110°

C = S25° E110° D = S35° E100°

Between which of the sets of co-ordinates is the shortest distance?

a. Between B and D

b. Between A and D

c. Between B and C

d. Between A and C.

59. The following points are plotted on a classroom globe representing the earth:

A = N05° E100° B = S05° E100°

C = S20° E110° D = S30° E110°

Between which of the sets of co-ordinates is the difference in latitude the least?

a. Between B and C

b. Between A and B

c. Between A and D

d. Between B and D.

60. The following points are plotted on a classroom globe representing the earth:

A = N05° E170° B = S10° W175°

C = S15° E175° D = S05° E155°

Between which of the sets of co-ordinates is the difference in longitude the least?

a. Between C and D

b. Between A and D

c. Between A and C

d. Between B and C.

61. The following point is plotted on a classroom globe representing the earth:

A = S25° E138°

Which set of coordinates below would be on the anti-meridian of position A?

a. S65° E048°

b. N25° W180°

c. N25° E138°

d. S25° W042°.

62. Which statement below best describes the earth's magnetic north pole?

a. The magnetic north pole changes position at a constant rate, which is why isogonals on charts need updating each year.

b. The magnetic north pole is stationary and variation at a place does not change with time.

c. The magnetic north pole changes position at a variable rate and variation at a certain position will change over time.

d. The magnetic north pole does not move but variation does change slowly over time.

63. Which one of the frequencies below should be used to cancel SARTIME when parked on the ground at YIVL?

a. 126.7 MHz

b. 6.610 MHz

c. 3.425 MHz

d. 127.1 MHz.

64. Calculate the runway wind components for RWY36, if the surface wind is 335°M at 25kts and the variation is 10°E?

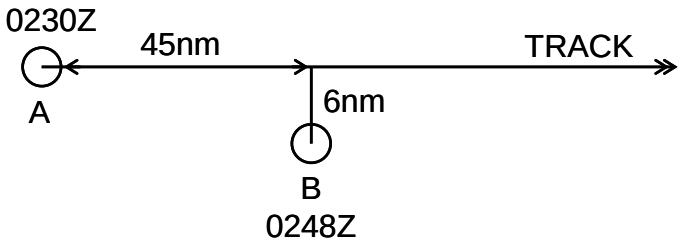
a. 23kts headwind and 11kts left crosswind

b. 24kts headwind and 7kts right crosswind

c. 20kts headwind and 15kts left crosswind

d. 25kts headwind and 3kts right crosswind.

65. In the following diagram, the aircraft at B alters heading to the left by 15°. At what time will track be regained and what heading change will be required to proceed along the planned track?



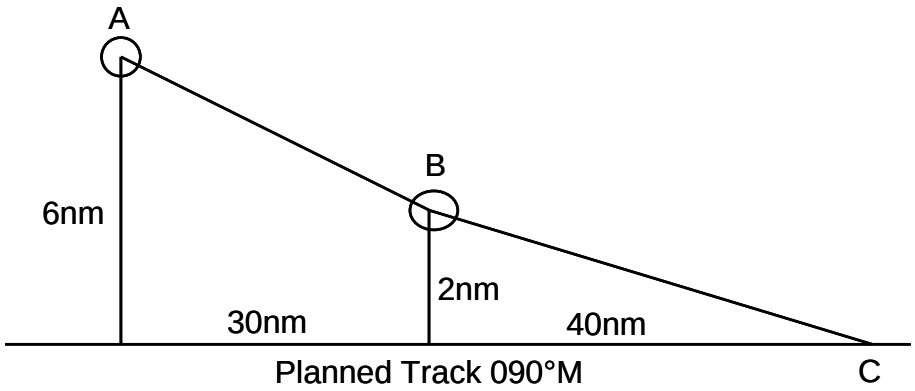
a. Intercept track at 0309Z and alter heading 8° to the right

b. Intercept track at 0314Z and alter heading 7° to the left

c. Intercept track at 0309Z and alter heading 15° to the right

d. Intercept track at 0308Z and alter heading 7° to the right.

66. Refer to the diagram below:



A: 0105 UTC pinpoint 6nm left of track. Heading 100°M.

B: 0124 UTC pinpoint 2nm left of track. Heading 095°M.

What is the drift experienced between A and B?

a. 2° right

b. 3° right

c. 2° left

d. 5° left.

67. With reference to the coordinates given for positions A and B below:

A = S30° E170° B = S30° W170°

In which direction must the aircraft travel, as measured at position A, in order to fly the shortest distance from A towards B?

a. 090°T

b. 270°T

c. Slightly more than 090°T

d. Slightly less than 270°T.

68. With reference to the coordinates given for positions E and F below:

E = S20° E100° F = S20° E125°

In which direction is the shortest rhumb line track from position E to F?

a. 090°T, along the S20° parallel of latitude

b. 270°T, along the S20° parallel of latitude

c. 180°T, along the E100° meridian via the South Pole, then 360°T along the E125° meridian.

d. There is no rhumb line track possible between E and F.

69. An aircraft is fuelled with 200 litres aviation turbine fuel. The pilot wants to complete the weight and balance sheet. What is the weight of the fuel load in pounds?

a. 110lbs

b. 360lbs

c. 200lbs

d. 317lbs.

70. Which one of the frequencies below should be used to cancel SARTIME when parked on the ground at YCKN?

a. 126.7 MHz

b. 3.425 MHz

c. 6.565 MHz

d. 134.65 MHz.

71. Which one of the frequencies below should be used to cancel SARTIME when parked on the ground at YSGE?

a. 118.95 MHz

b. 3.452 MHz

c. 6.565 MHz

d. 126.7 MHz.

72. Given a wind of 270°M at 30kts, which of the runways below would have the greatest headwind component?

a. Runway 21

b. Runway 03

c. Runway 25

d. Runway 07.

73. You are cruising at A095 and will be arriving at an airfield with elevation of 1,000 feet amsl. You are requested to start your descent at 50DME to provide traffic clearance and have been instructed to arrive 1,500 feet overhead the airfield. If your descent groundspeed is 180kts, what is the required rate of descent for a constant descent?

a. 420 feet per minute

b. 510 feet per minute

c. 480 feet per minute

d. 570 feet per minute.

74. With reference to the coordinates given for positions C and D below:

C = S30° E150° D = S30° E120°

The shortest track from C to D is:

a. Less than 270°T from A, then greater than 270°T at B.

b. Greater than 270°T from A, then less than 270°T at B.

c. Less than 270°T from A.

d. Exactly 270°T from A.

75. The current Eastern Summer Time is 0800 on 16 November. What is the time at the Greenwich meridian?

a. 152100 UTC

b. 162100 UTC

c. 152200 UTC

d. 162200 UTC

e. 152230 UTC.

76. What is the approximate weight of 40 US Gallons AVGAS?

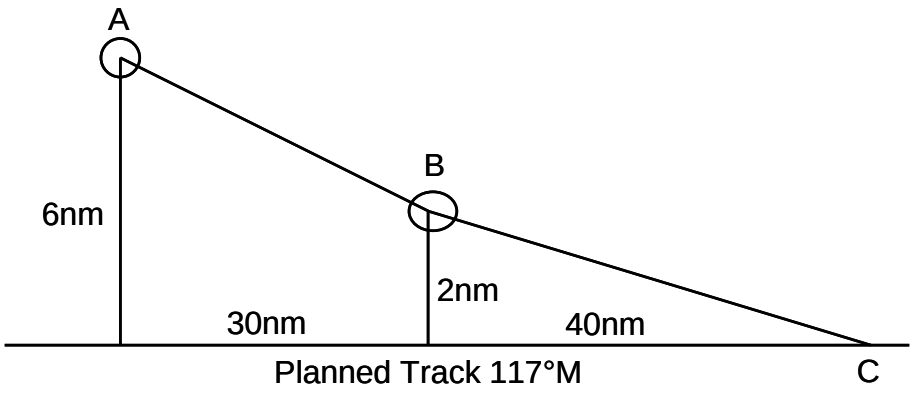
a. 109lbs

b. 72lbs

c. 240lbs

d. 108lbs.

77. Refer to the diagram below:



A: 0325 UTC pinpoint 6nm left of track. Heading 130°M.

B: 0346 UTC pinpoint 2nm left of track.

What heading (°M) is required at B to intercept planned track at C?

a. 127°M

b. 125°M

c. 122°M

d. 120°M.

11.1.1 Worksheet Answers

1. 162006UTC	19A	39D	59B
2. 050748UTC	20D	40A	60C
3C	21D	41C	61D
4.(a) 1 : 5,103,840	22C	42B	62C
4.(b) 357.269km	23D	43B	63B
5C	24C	44A	64A
6B	25A	45A	65D
7D	26B	46D	66C
8C	27D	47D	67C
9B	28C	48D	68A
10. 092°M/46	29D	49C	69B
11B	30C	50C	70D
12D	31B	51B	71B
13.(a) A	32B	52A	72C
13.(b) B	33B	53C	73A
14D	34B	54D	74A
15B	35B	55D	75A
16D	36A	56D	76D
17D	37C	57D	77B
18C	38A	58A	