



Headquarters Air Cadets Examination

Senior Cadet
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1. Use black or dark blue pen, NOT pencil.
2. Mark one answer per question with a cross.
3. If you wish to change an answer, cancel the original mark and mark another single answer.

☒ A selected answer.

☒ A cancelled answer.

Mark:

Name and Initials _____

Date of Exam _____

Date of Birth _____

Squadron/Unit _____

Wing _____

1 Distance on the Earth's surface is measured in Nautical Miles (nm). Which of the following is true:

- a ☐ One nm is equal to 5280 feet
- b ☐ One nm equals 1/10,000 of the distance from the North Pole to the Equator
- c ☐ One nm is equal to one minute of longitude
- d ☐ One nm is equal to one minute of latitude

2 In Germany, Kiel is due north of Warzburg. If Kiel's latitude is 54 20N and Warzburg's is 49 48N, how far are they apart:

- a ☐ 27.2nm
- b ☐ 272nm
- c ☐ 2720nm
- d ☐ 227nm

3 In aviation, speed is measured in:

- a ☐ Kilometres per hour (km/hr)
- b ☐ Miles per hour (mph)
- c ☐ Knots (kts)
- d ☐ Metres per hour (m/hr)

4 A Hercules is flying at a groundspeed of 210kts. How far will it travel in 3 hours:

- a ☐ 630nms
- b ☐ 70nms
- c ☐ 630km
- d ☐ 210nms

5 What time is used as standard in military and commercial aviation:

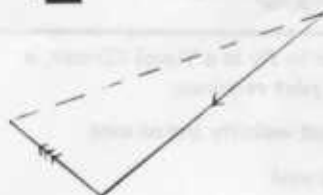
- a ☐ British summer time
- b ☐ Greenwich mean time (Universal time)
- c ☐ The time of the country over which the aircraft is flying
- d ☐ European daylight saving time

6 A vector is a line, drawn to represent a velocity. This is achieved by:

- a ☐ The bearing of the line represents the direction and the length of the line representing the speed
- b ☐ The bearing represents speed and the length represents direction
- c ☐ The bearing represents knots at all times
- d ☐ The length represents mph at all times

7 In the Air Triangle drawn here, name the components of the 3rd side, represented by a dotted line:

- a ☐ Wind velocity
- b ☐ Heading and true airspeed
- c ☐ Drift and groundspeed
- d ☐ Track and groundspeed



8 You are flying at 120knots groundspeed. How long will it take to fly 20nms:

- a ☐ 10 minutes
- b ☐ 6 minutes
- c ☐ 2 minutes
- d ☐ 60 minutes

9 An aircraft departs from base, but does not arrive at the destination, on its Estimated Time of Arrival. What action will Air Traffic Control take:

- a ☐ Initiate overdue action
- b ☐ Contact the departure base
- c ☐ Close down
- d ☐ No immediate action is required

10 An aircraft is flying from Point A to Point B. A pinpoint fix shows it to be off track. A line from the pinpoint fix, to point B would be known as:

- a ☐ Track required
- b ☐ Heading required
- c ☐ Revised track
- d ☐ Track made good

11 Using the 1 in 60 rule, calculate how many miles off track an aircraft will be, if it flies 60nms with a track error of 2 degrees:

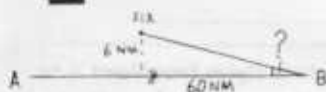
- a ☐ 6nms
- b ☐ 2nms
- c ☐ 60nms
- d ☐ 4nms

12 An aircraft is flying from A to B, after 20 nms it is found to be 3nms off track. What is the track error:

- a ☐ 6 degrees
- b ☐ 2 degrees
- c ☐ 9 degrees
- d ☐ 4 degrees

- 13 An aircraft flying from A to B finds itself 6nms off track. It has a further 60nms to travel. What is the required closing angle:

a ☐ 2 degrees
b ☐ 10 degrees
c ☐ 3 degrees
d ☐ 6 degrees



- 14 An aircraft flying from A to B finds that after 40nms it is 4nms off track. If it has a further 60nms to travel by how much does the pilot need to turn to regain the intended track at B:

a ☐ 12 degrees
b ☐ 6 degrees
c ☐ 4 degrees
d ☐ 10degrees

- 15 An aircraft flying from A to B finds that after 20nms, it is 2nms right of track. If it has a further 40nms to travel, by how much does the pilot need to turn, to regain the intended track at B:

a ☐ 12 degrees left
b ☐ 9 degrees left
c ☐ 6 degrees left
d ☐ 6 degrees right

- 16 When would a Direct Indicating Compass be most accurate:

a ☐ In unaccelerated flight
b ☐ In a turn
c ☐ In a steady climb
d ☐ In a steady descent

- 17 Which of the following, is not a component within a Gyro-magnetic system:

a ☐ A flux valve magnetic detector
b ☐ A gyroscope
c ☐ A suspended magnet
d ☐ A turn/acceleration cut out switch

- 18 A gyroscope cannot be perfect, and so over a period of time it becomes inaccurate, this is called:

a ☐ Gyro wander
b ☐ Variation
c ☐ Gyro rigidity
d ☐ Turn/acceleration error

- 19 Where are variation values at their greatest:

a ☐ In the Northern hemisphere
b ☐ In polar regions
c ☐ At the equator
d ☐ In the Southern hemisphere

- 20 What principle does an Inertial Navigation System use, to calculate the position of the aircraft:

a ☐ The navigator must update the Inertial Navigation system all the time
b ☐ It uses compass heading and doppler values to compute aircraft position
c ☐ It is set accurately on the ground, and then measures the accelerations in the fore, aft and lateral
d ☐ A gyroscope feeds position to the computer

- 21 In order to fly in a Visual CIRcuit, a trainee pilot requires:

a ☐ Good visibility and no wind
b ☐ No wind
c ☐ Good visibility, and no cloud in the sky
d ☐ Visibility and cloudbase conditions to meet the aerodrome controller's requirements

- 22 The wind is blowing directly down the length of a runway. What is the crosswind component:

a ☐ Equal to the winds speed
b ☐ Zero crosswind component
c ☐ Equal to half the winds speed
d ☐ Equal to 3/4 of wind speed

- 23 What problems can be caused by heavy rain:

a ☐ Runway Visual Range
b ☐ Heavy snow
c ☐ Restricted visibility and flooded runway
d ☐ Thunderstorms

- 24 What can be the effects of heavy icing, on an aircraft's performance:

a ☐ Loss of aerodynamics only
b ☐ There is no adverse effect on the aircraft's performance
c ☐ It will fly much slower
d ☐ Loss of aerodynamics and reduced engine performance

- 25 One minute of latitude on the Earth's surface is equal to:

a ☐ 1 nautical mile
b ☐ 60 nautical miles
c ☐ 1 knot
d ☐ 1km