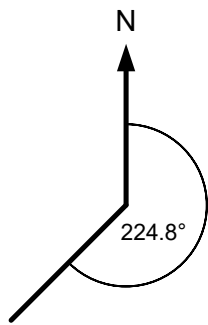


Bearings



Bearings are angles measured from north in a clockwise direction. They are used for navigation by aircraft and ships. You may also use them when doing your expedition for your Duke of Edinburgh's Award.

Important things you need to know when calculating bearings are that co-interior angles sum to 180° and angles about a point sum to 360° . You must also remember that bearings are always measured from NORTH.

In navigation, bearings are given as three figures. so due East would be a bearing of 090° as opposed to 90° .

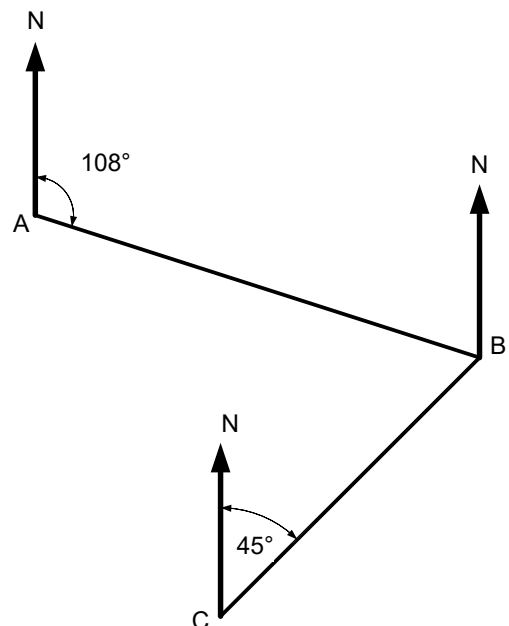
At the end of a runway when an aircraft is coming into land, the bearing is rounded to 2 significant figures and written as a two-digit number, ignoring the place holder in the units' column. For example, a runway with threshold bearing of 290° will be written as runway 29 on the tarmac at the threshold of the runway.

Calculate the following angles:

- 1 A plane flies from B to A. On what bearing is the flight heading?

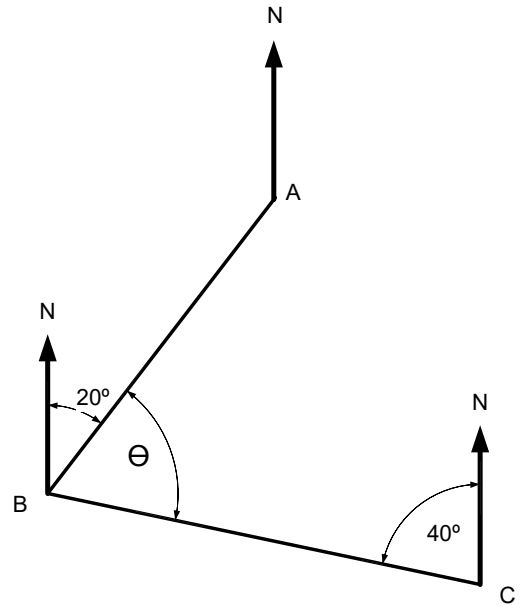


- 2 A ship sails from A to B and then turns clockwise to sail to C. Through what angle has the ship turned at point B?

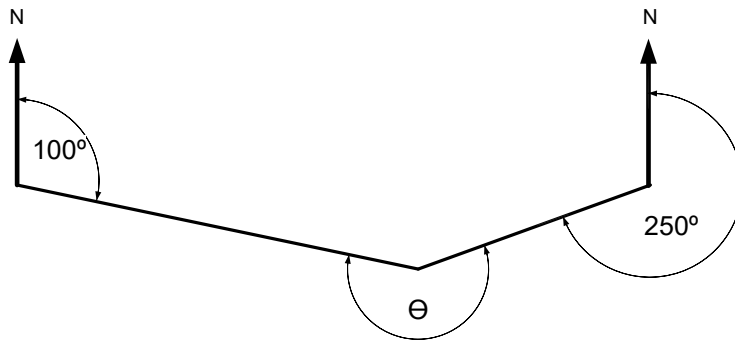


3 The diagram below shows the path of an aircraft on a flight.

- a On what bearing must the aircraft fly to follow path AB?
- b What is the size of angle Θ ?



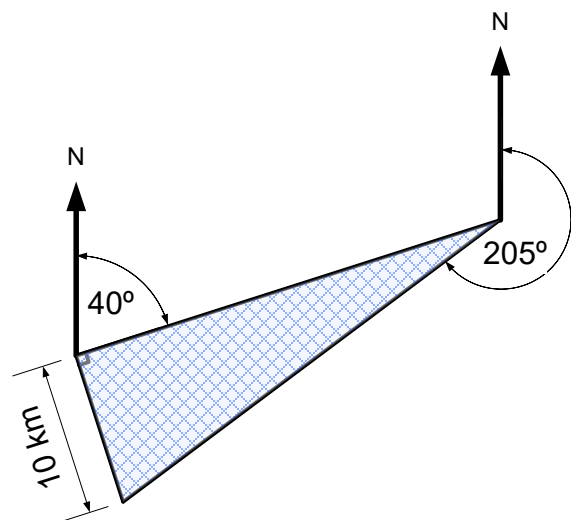
4 Calculate the size of angle Θ .



5 A small boat has gone missing on the ocean. The search and rescue mission is being led by a Coast Guard helicopter. The shaded area of the diagram represents the search area in which you think the boat may be found.

It takes one hour to search 15 km^2 of ocean.

How long will it take for the search and rescue mission to be completed?



- 6 An aircraft left Heathrow airport on runway 27. The aircraft immediately turned to head in the direction of NNW and flew 200km along that heading. The aircraft turned 90° to port and continued flying for 7 hours at 750 kmh^{-1} . At this point, the aircraft landed.

What heading should the aircraft take to make a direct return crossing?

Hints:

Draw a diagram. Mark on North for each significant turning point on the diagram.

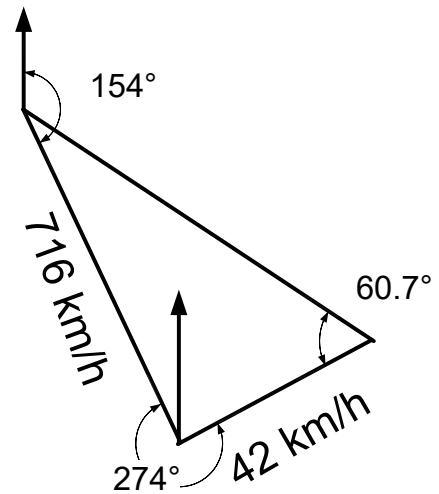
Calculate the distance travelled at 750 kmh^{-1} .

Work out the bearings of the headings for each section of the flight.

Calculate the return heading.

- 7 An aircraft is flying on a heading of 154° at a speed of 716 kmh^{-1} . The wind is blowing at 42 kmh^{-1} as shown on the diagram.

- a What is the actual heading of the aircraft?
- b How fast is it moving over the ground?

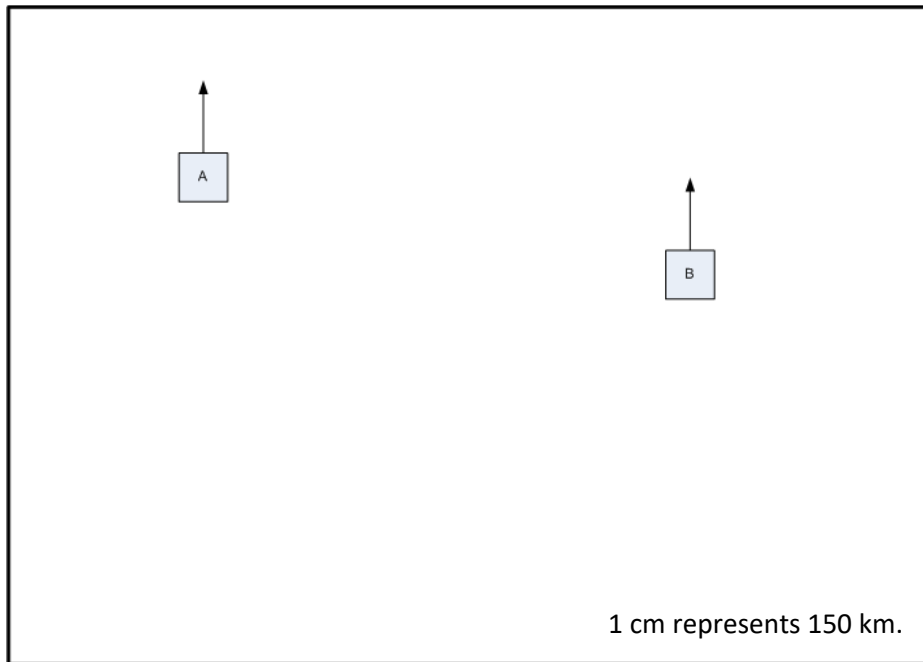


- 8 Calculate the bearing from B to A.



Diagram not drawn accurately

- 9 The diagram below shows two cities, A and B.
The arrows show north.



- a Find the bearing from A to B.
- b C is a city SE of A. It is also on a bearing of 260 degrees from B.
Draw the exact position of C on the diagram.
- c How far is it from C to A in real life?