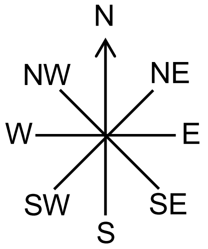
GCSE (9–1)
MATHEMATICS

Topic Check In - 10.01b and 10.01c Units and measurement



1. A three figure bearing of 090° is the same as which direction on a compass?

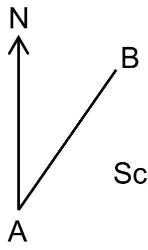
2. A compass bearing of SW is the same as which three-figure bearing?

3. A map is drawn to a scale of 1 : 5000 which means:

   1 cm on the map represents _______ cm or _______ m.

4. A road on a map is 5 cm long and represents an actual distance of 200 m.
   What scale is used for the map?

5. Carl travels from point A to point B, as shown on the scale diagram below.

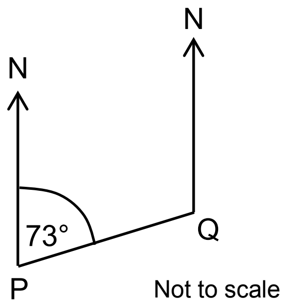


Scale 1:200

Complete this statement.

Carl travels on a bearing of _______ for _______ m.

6. The diagram on the right shows a journey from P to Q.
   Show that the bearing of P from Q is 253°.



7. A boat navigates around a coastline.
   Choose a suitable scale and draw the path the boat takes.
   Show that the boat has travelled approximately 400 m North in total.

	Bearing	Distance
From W to X	060°	500 m
From X to Y	090°	300 m
From Y to Z	075°	600 m

8. Lifeboat station X is due West from lifeboat station Y, 8 km apart on the coast.
   They both receive an SOS from a boat in difficulty out at sea.
   Station X receives the signal on a bearing of 040° and station Y on a bearing of 290°.
   Explain which station should send a lifeboat out for the rescue operation.

9. A light aircraft flies on a bearing of 080° for 400 km from Town A to Town B. It then flies to Town C on a bearing of 130° for 100 km. Find the distance and bearing of the direct route from Town C back to Town A.

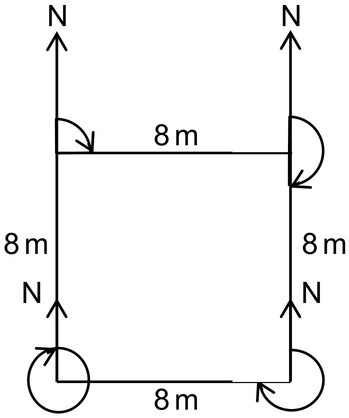
10. A submarine, anchored at sea, detects a moving object with its sonar. The table below shows two sonar readings taken at a 10 second interval.

Time	Bearing from submarine	Distance from the submarine
0 seconds	150°	50 m
10 seconds	070°	100 m

Using a scale of 1 cm to represent 10 m, draw a scale diagram to show this information and calculate the speed of the object.

Extension

a) A robot is programmed to move around a square lawn of side 8 m.
Write the instructions giving the angles it turns as bearings.



b) The robot is then programmed to move in the shape of a regular hexagon of side 6 m.
Write the instructions giving the angles it turns as bearings.

Answers

1. East

2. 225°

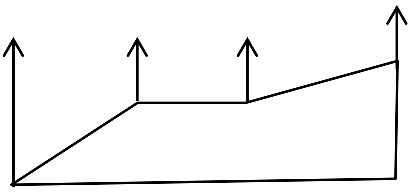
3. 5000 cm or 50 m

4. 1 : 4000

5. Angle = 035°
   Length = measured length dependent upon reprographic effects × 2 for distance in m
   (measured length dependent upon reprographic effects × 200 = distance in cm)

6. Bearing is 73° + 180° = 253° oe

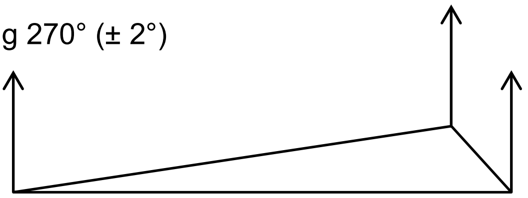
7. Possible scale 1 : 10000 or 1 cm represents 100 m
   Distance North = 400 m (± 20 m)



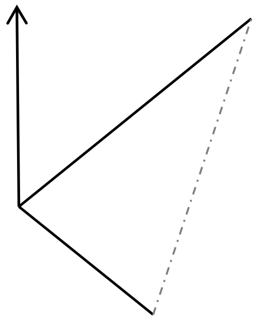
≈ 4 cm
on scale diagram

8. Students to recognise that bearing of 290° will mean a 20° angle inside triangle.
   Scale diagram gives XB = 2.9 km and YB = 6.5 km.
   Alternatively, students may sketch diagram and use knowledge of relationship between angles and lengths of triangles (smallest interior angle opposite shortest side length).

9. Distance 470 km (± 20 km), bearing 270° (± 2°)



10. Distance travelled in 10 seconds = 104 m (± 2 m)
    Speed = 10.4 m/s (± 0.2 m/s)



Extension

a) Square

Bearing	Distance
090°	8 m
180°	8 m
270°	8 m
360°	8 m

b) Hexagon

Bearing	Distance
090°	6 m
150°	6 m
210°	6 m
270°	6 m
330°	6 m
390°	6 m

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Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Translate a three figure bearing to a compass direction.			
AO1	2	Translate a compass bearing to a three figure bearing.			
AO1	3	Interpret the scale of a map.			
AO1	4	Define the scale of a map.			
AO1	5	Measure a bearing and distance from a scale diagram.			
AO2	6	Calculate bearings from a diagram.			
AO2	7	Draw a scale diagram.			
AO2	8	Use bearings to draw a triangle.			
AO3	9	Solve a return journey problem.			
AO3	10	Use a scale diagram to solve a speed problem.			

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