

Bearings, Scale Drawing, Constructions & Loci

Bearings / Scale / Constructing Triangles / Constructions / Loci

Easy (11 questions)	/26
Medium (8 questions)	/29
Hard (11 questions)	/69
Total Marks	/124

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Easy Questions

- 1 In triangle ABC , $BC = 7.6\text{cm}$ and $AC = 6.2\text{ cm}$.

Using a ruler and compasses only, construct triangle ABC . Leave in your construction arcs.

The side AB has been drawn for you.



(2 marks)

- 2 **Using a straight edge and compasses only**, construct the equilateral triangle ABC .

Side AB has been drawn for you.



(2 marks)

3



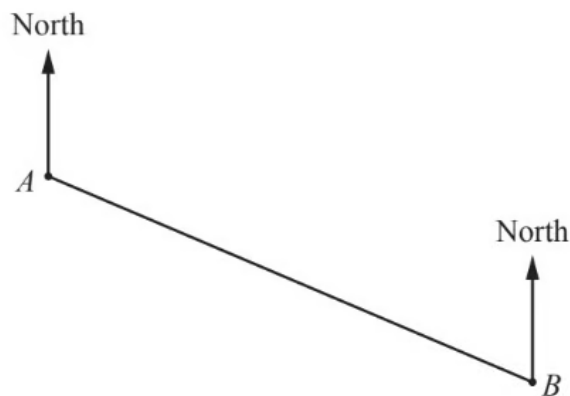
The diagram shows the base of a triangle.

The lengths of the other two sides are 6cm and 4cm.

Using a ruler and compasses only, construct the other two sides of the triangle.
Show all your construction arcs.

(2 marks)

4



Measure the bearing of B from A .

(1 mark)

- 5** This scale drawing shows the window in the room.
The scale is 1 centimetre represents 40 centimetres.



Scale: 1 cm to 40 cm

Work out the actual length and height of the window.

Length = cm

Height = cm

(2 marks)

- 6** The scale drawing shows the positions of town S and town T . The scale is 1 centimetre

represents 15 kilometres.



Scale: 1 cm to 15 km

i) Find the actual distance between these two towns.

..... km

ii) Measure the bearing of town T from town S .

[1]

(3 marks)

7 Using a straight edge and compasses only, construct the equilateral triangle ABC .

The base AB has been drawn for you.



(2 marks)

8 In triangle ABC , $AC = 7\text{cm}$ and $BC = 5\text{ cm}$.

i) **Using a ruler and compasses only**, construct triangle ABC .

AB has been drawn for you.



[2]

ii) Measure angle ABC .

[1]

(2 marks)

9



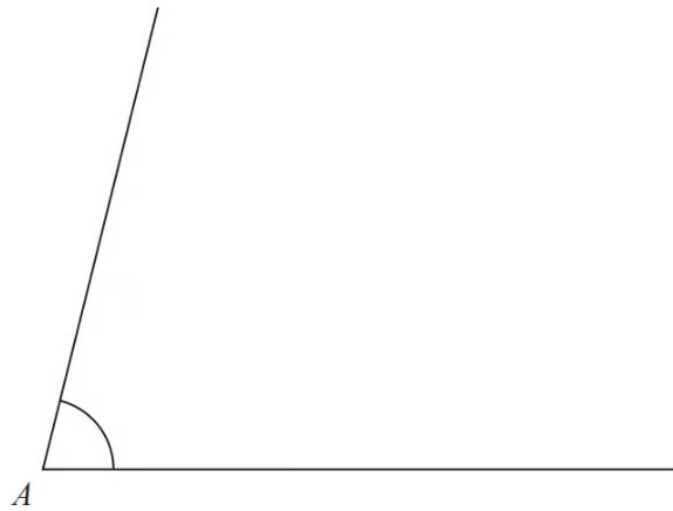
Use ruler and compasses to **construct** the perpendicular bisector of the line segment AB .

You must show all your construction lines.

(2 marks)

10 (a) Use ruler and compasses to bisect the angle at A .

You must show all your construction lines.



(2 marks)

- (b) Use ruler and compasses to construct the perpendicular from the point P to the line QR .

You must show all your construction lines.

P
 $\times$



(2 marks)

11 (a) Jen is drawing a diagram where 2 cm represents 5 km.

She wants to draw a line representing 15 km.

How many centimetres does she need to draw?

(2 marks)

(b) Jen draws a line of length 26 cm.

How many kilometres does this line represent?

(2 marks)

Medium Questions

- 1 A field, ABC, is in the shape of a triangle.
 $AC = 500\text{m}$ and $BC = 650\text{m}$.

Using a ruler and compasses only, complete the scale drawing of the field ABC.
Leave in your construction arcs.
Use a scale of 1 cm to represent 100m.
The side AB has been drawn for you.



Scale: 1 cm to 100m

(3 marks)

- 2 The scale drawing shows the positions of two towns, A and B . The scale is 1 centimetre

represents 10 kilometres.



Scale : 1 cm to 10 km

i) Work out the actual distance between town *A* and town *B*.

..... km [2]

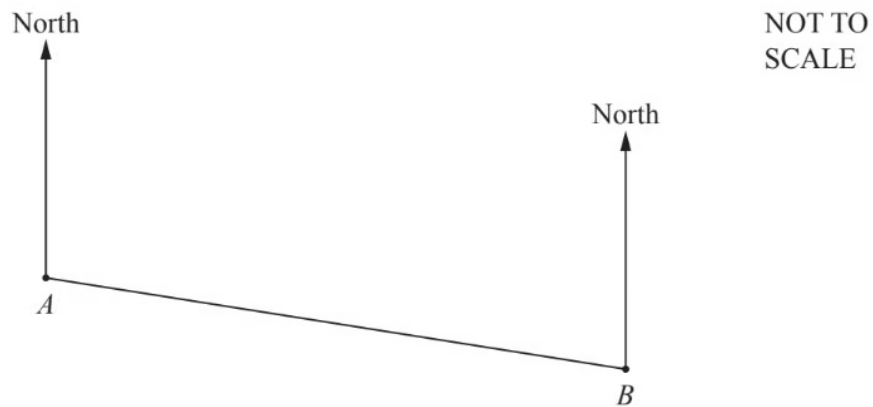
ii) Town C is 85 km from town A on a bearing of 100° .

On the scale drawing, mark the position of town C.

[2]

(4 marks)

3



The bearing of B from A is 105° .
Find the bearing of A from B .

(2 marks)

- 4 Using a ruler and pair of compasses only, construct a triangle with sides 5cm, 8cm and 10 cm.
Leave in your construction arcs.

(2 marks)

- 5 The scale drawing shows a rock, R .

The scale is 1 centimetre represents 30 metres.

A lighthouse, L , is 210m from R , on a bearing of 125° .

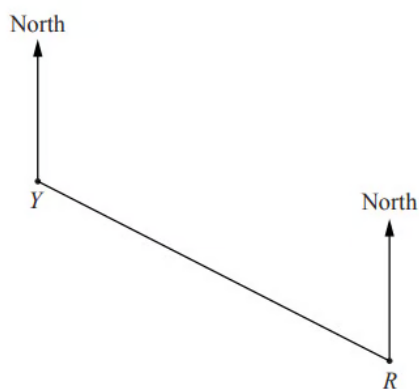
On the diagram, mark the position of L .



Scale : 1 cm to 30 m

(2 marks)

- 6 (a)** The scale drawing shows the positions of two towns, Yatterford (Y) and Rexley (R), on a map.
The scale is 1 centimetre represents 15 kilometres.



Scale: 1 cm to 15 km

- i) Write the scale of the map in the form 1: n .

1 : [2]

ii) Work out the actual distance of Rexley from Yatterford.

..... km [2]

iii) Measure the bearing of Rexley from Yatterford.

[1]

iv) A hospital is to be built on an area of land between 45km and 60km from Yatterford.
The bearing of the hospital from Yatterford is between 250° and 295° .

On the map, construct and shade the region in which the hospital is to be built.

[5]

(10 marks)

(b) The bearing of Bartown from Whitestoke is 073° .

Work out the bearing of Whitestoke from Bartown.

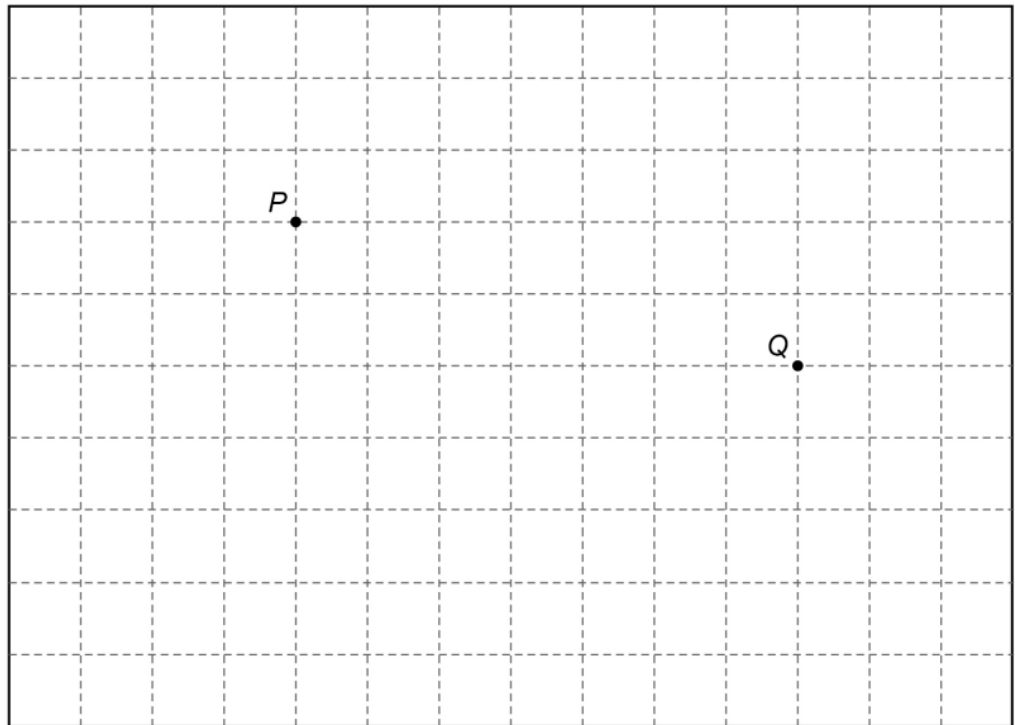
(2 marks)

7 The scale drawing represents a garden.

Water from a sprinkler at P reaches up to 20 metres from P .

Water from a sprinkler at Q reaches up to 25 metres from Q .

Scale: 1 cm represents 5 m



Using a pair of compasses,
show the region that water from **both** sprinklers reaches.

(2 marks)

8 Construct a locus of points that are the same distance from points A and B .

•
 A

•
 B

(2 marks)

Hard Questions

- 1 (a) Point B is 36 km from point A on a bearing of 140° .

Using a scale of 1 centimetre to represent 4 kilometres, mark the position of B .



Scale: 1 cm to 4 km
(2 marks)

- (b) i) Point C is 28 km from A and 20 km from B .

The bearing of C from A is less than 140° .

Using a ruler and compasses only, construct triangle ABC . Show all your construction arcs.

[3]

- ii) Measure angle ACB .

Angle ACB = [1]
(4 marks)

- 2 (a)** The scale drawing shows the positions of town *A* and town *B*. The scale is 1 cm represents 12 kilometres.



Scale: 1 cm to 12 km

Find the actual distance between town *A* and town *B*.

..... km
(2 marks)

- (b)** Town *C* is 72 km from town *A* and 96km from town *B*.
On the scale drawing, construct the position of town *C*.

(3 marks)

3 (a) A circular garden has diameter 11.4 m.

Draw the garden accurately, using a scale of 1cm represents 1.5 m.

Scale: 1cm to 1.5m

(2 marks)

(b) On a map, the distance between two towns is 9.6cm.

The scale of the map is 1 : 50000.

Work out the actual distance between the two towns in kilometres.

..... km

(2 marks)

4 The scale drawing shows the positions of a rock, R , and a statue, S , on a map.

The scale is 1 centimetre represents 6 metres.



Scale: 1 cm to 6 m

i) Work out the actual distance between R and S .

..... m [2]

ii) A flagpole, F , is on a bearing of 164° from S .

Work out the bearing of S from F .

[2]

iii) Ishaan uses the map to find some treasure, T .

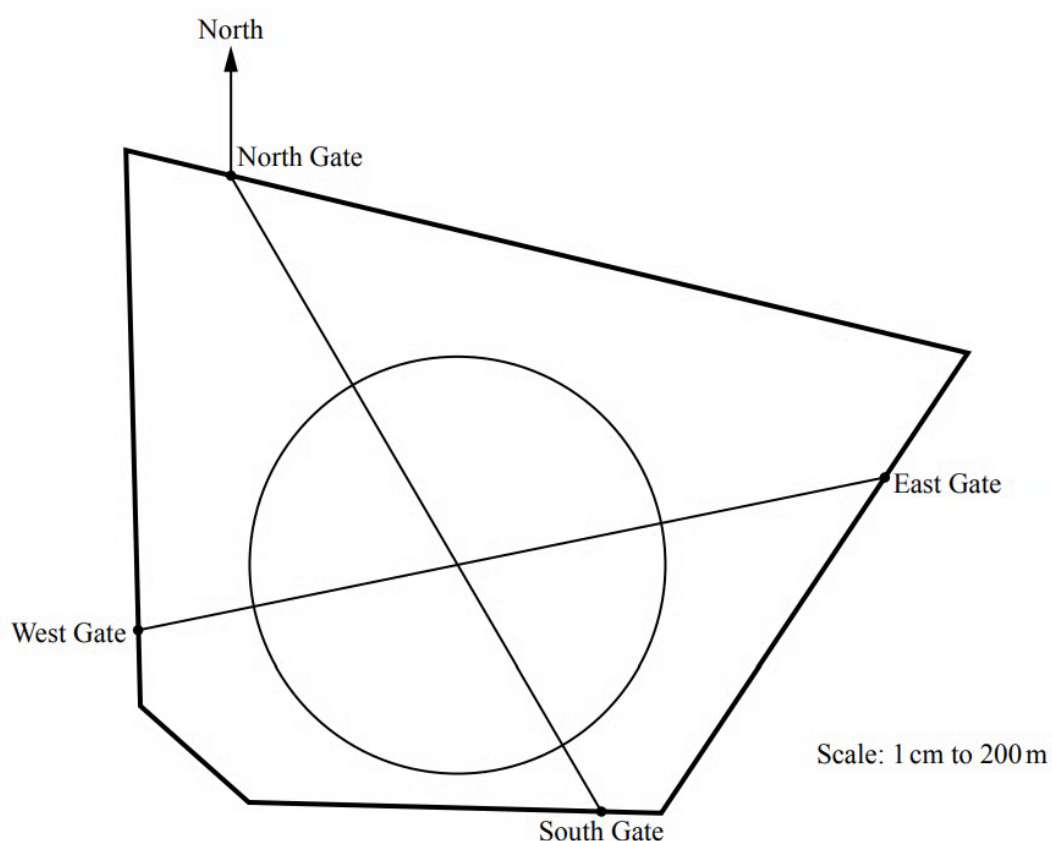
T is on a bearing of 076° from R and on a bearing of 337° from S .

Mark the position of T on the map.

[2]

(6 marks)

- 5 The scale drawing shows a map of Kingswood Park.
There are two straight paths and one circular path.
The scale is 1 cm represents 200m.



- i) Yana walks along the straight path from East Gate to West Gate.

Work out the distance she walks.
Give your answer in kilometres.

..... km [2]

- ii) Measure the bearing of South Gate from North Gate.

[1]

iii) The entrance, P, to a children's play area is 500 metres from North Gate on a bearing of 195° .

Mark the position of P on the map.

[2]

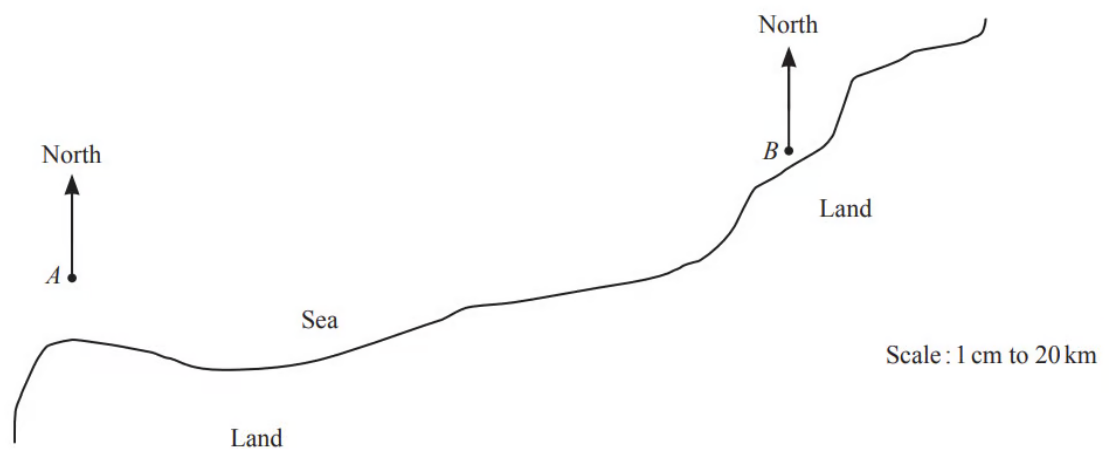
iv) Ivan runs once around the circular path.

Calculate the distance Ivan runs.

..... m [4]

(9 marks)

- 6 The scale drawing shows the positions of two buoys, *A* and *B*, in the sea.
The scale is 1 centimetre represents 20 kilometres.



- i) Work out the actual distance between buoy *A* and buoy *B*.

..... km [2]

- ii) Measure the bearing of buoy *B* from buoy *A*.

[1]

- iii) Buoy *C* is 120 km from buoy *B* on a bearing of 300° .

On the scale drawing, mark the position of buoy *C*.

(7 marks)

7 (a) The scale drawing shows the positions of town *A* and town *B*.

The scale is 1 centimetre represents 12 kilometres.



Scale : 1 cm to 12 km

i) Measure the bearing of town *B* from town *A*.

[1]

ii) Find the actual distance from town *A* to town *B*.

..... km [2]

iii) Town *C* is on a bearing of 064° from town *A* and 028° from town *B*.

On the scale drawing, mark the position of town C .

[2]

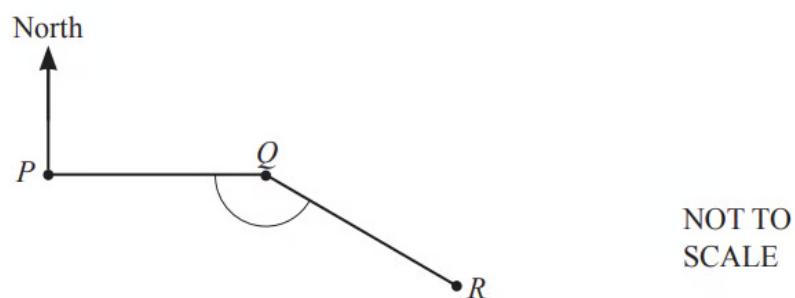
(5 marks)

- (b) The bearing of town D from town E is 245° .

Work out the bearing of town E from town D .

(2 marks)

- (c) The diagram shows three towns, P , Q and R .



The bearing of town Q from town P is 090° .

- i) Complete the statement.

Town is due west of town

[1]

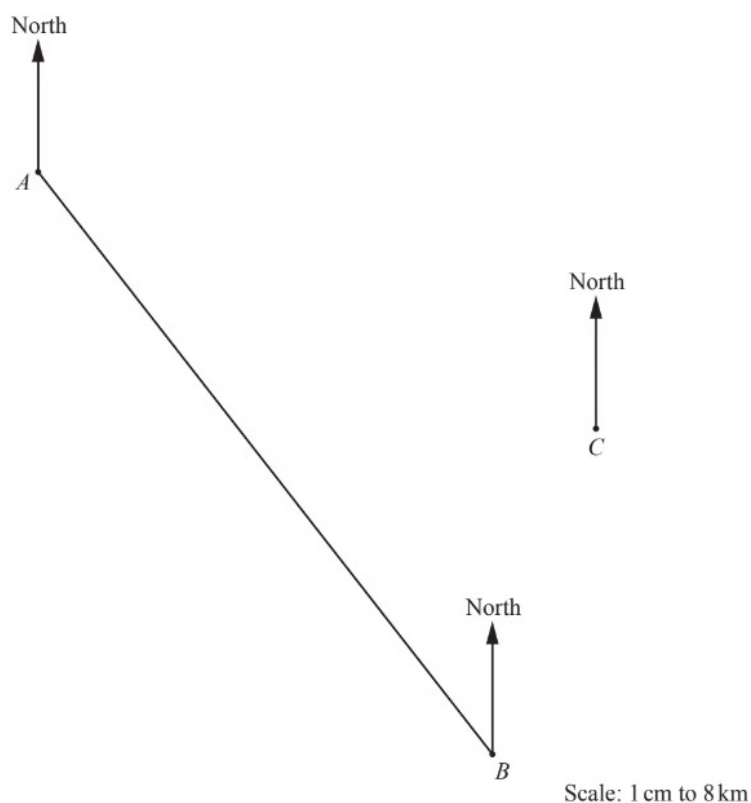
- ii) PQ and QR are two sides of a regular decagon.

Work out angle PQR .

Angle PQR = [3]

(4 marks)

- 8 (a)** The scale drawing shows town A , town B and town C on a map.
 There is a straight road between town A and town B .
 The scale of the map is 1 centimetre represents 8 kilometres.



Measure the bearing of town A from town B .

(1 mark)

- (b)** Work out the actual distance, in kilometres, between town A and town B .

..... km

(2 marks)

- (c)** Write the scale of the map in the form 1 : n .

1 :

(1 mark)

- (d) A straight road from town C is on a bearing of 246° .
It meets the road from town A to town B at point X .

On the map, draw the road from town C to point X .
Label the position of X .

(1 mark)

- (e) i) Josie is at point X at 10 50. She arrives at town B 37 minutes later.

Work out the time that she arrives at town B .

[1]

- ii) Sammy leaves town A and travels to town B at a constant speed of 75 km/h.

a) Work out the time for this journey. Give your answer in hours and minutes, correct to the nearest minute.

..... h min [3]

- b) Sammy wants to arrive at town B at the same time as Josie.

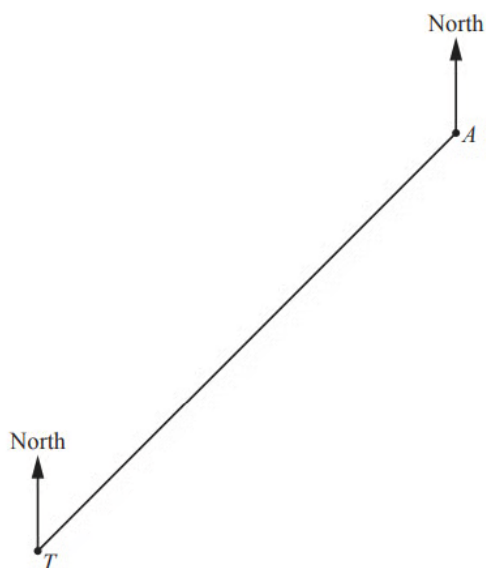
Work out the time that Sammy must leave town A .

[1]

(5 marks)

9 (a) The scale drawing shows the positions of an airport (*A*) and a train station (*T*) on a map.

The scale is 1 centimetre represents 2 kilometres.



Scale: 1 cm to 2 km

Work out the actual distance, in kilometres, of the train station from the airport.

..... km

(2 marks)

(b) Measure the bearing of the airport from the train station.

(1 mark)

(c) The bus station is not shown on the map.

The bearing of the bus station from the train station is 318° .

Work out the bearing of the train station from the bus station.

(2 marks)

10 An equilateral triangle has side length 16 metres.

Using ruler and compasses only, construct a scale drawing of the triangle.

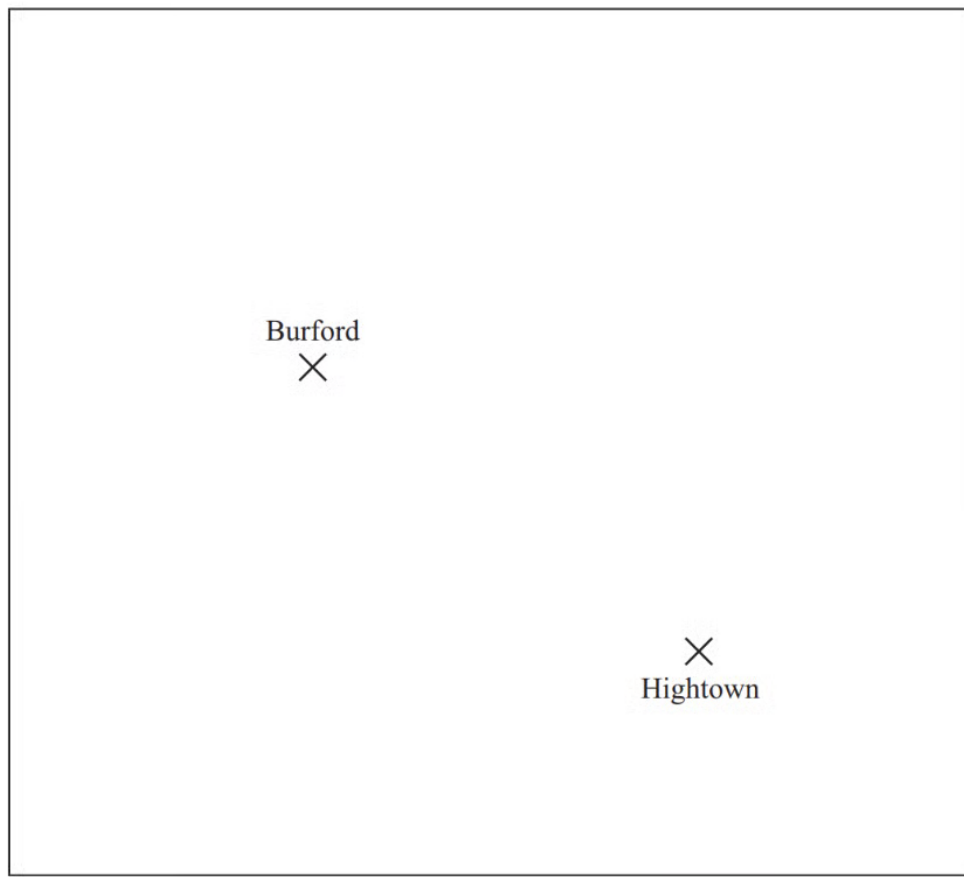
Use the scale 1 centimetre represents 2 metres.

Scale: 1 cm represents 2 m

(3 marks)

11 Here is a map.

The map shows two towns, Burford and Hightown.



Scale: 1 cm represents 10 km

A company is going to build a warehouse.

The warehouse will be less than 30 km from Burford **and** less than 50 km from Hightown.

Shade the region on the map where the company can build the warehouse.

(3 marks)