

1. (a) Use **£1 = 9.60 francs** to work out how much **45p** is in francs.

Show your working.



$$45p = \dots\dots\dots \text{ francs}$$

2 marks

- (b) Use **240 pesetas = £1** to work out how much **408 pesetas** is in pounds.

Show your working.



$$408 \text{ pesetas} = \text{£} \dots\dots\dots$$

2 marks

- (c) Use **£1 = 9.60 francs** and **£1 = 240 pesetas** to work out how much **1 franc** is in **pesetas**.

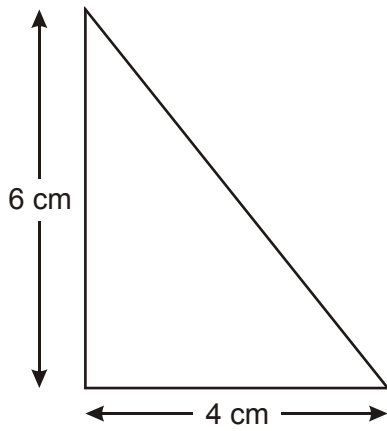
Show your working.



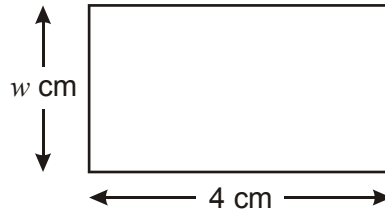
$$1 \text{ franc} = \dots\dots\dots \text{ pesetas}$$

2 marks

2. The triangle and the rectangle below have the **same area**.



Not drawn accurately



Work out the value of w

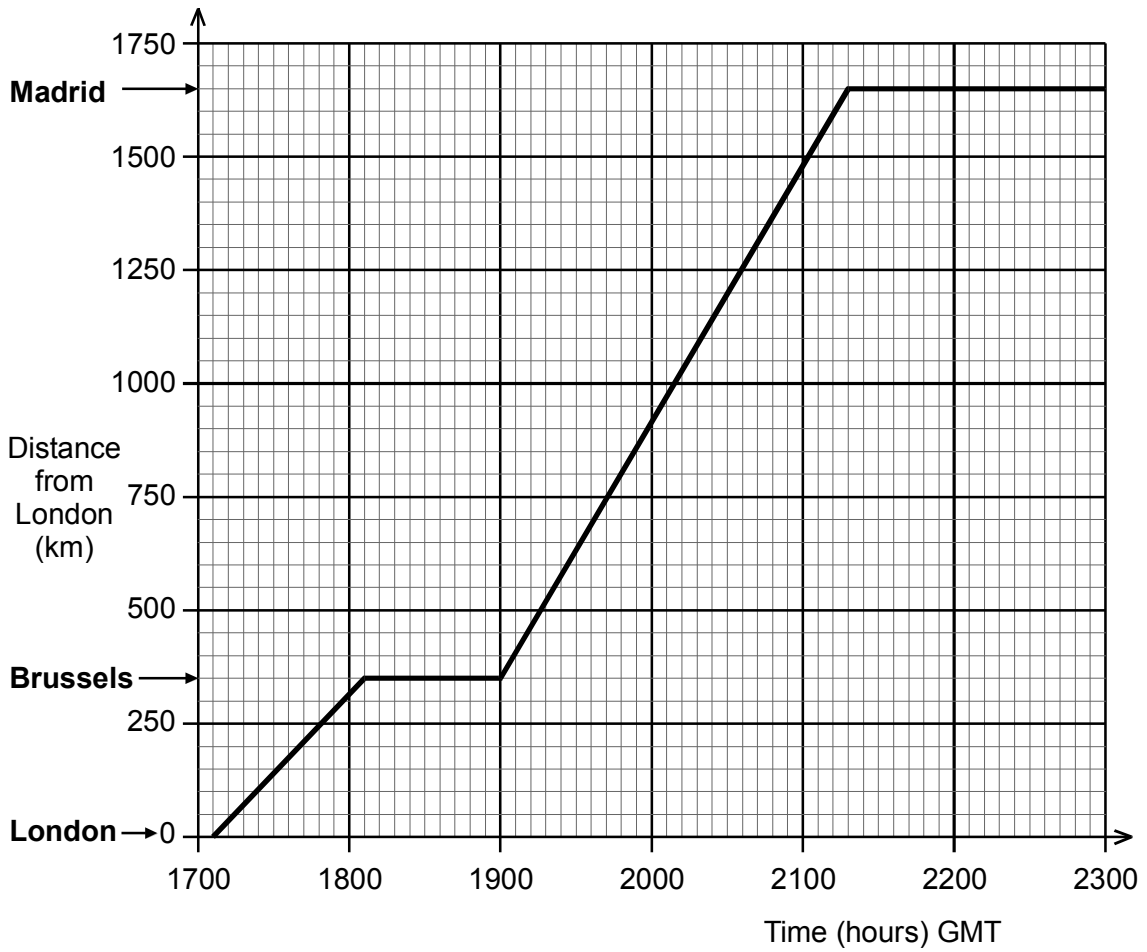
Show your working.



$w = \dots\dots\dots$ cm

2 marks

3. The simplified graph shows the flight details of an aeroplane travelling from London to Madrid, via Brussels.



- (a) What is the aeroplane's average speed from **London** to **Brussels**?



..... km/h

1 mark

- (b) How can you tell from the graph, **without calculating**, that the aeroplane's average speed from Brussels to Madrid is **greater** than its average speed from London to Brussels?



1 mark

- (c) A different aeroplane flies **from Madrid to London**, via Brussels.

The flight details are shown below:

Madrid	<i>depart</i>	1800
Brussels	<i>arrive</i>	2000
	<i>depart</i>	2112
London	<i>arrive</i>	2218

On the graph, show the aeroplane's journey from Madrid to London, via Brussels.
(Do not change the labels on the graph.)

Assume constant speed for each part of the journey.

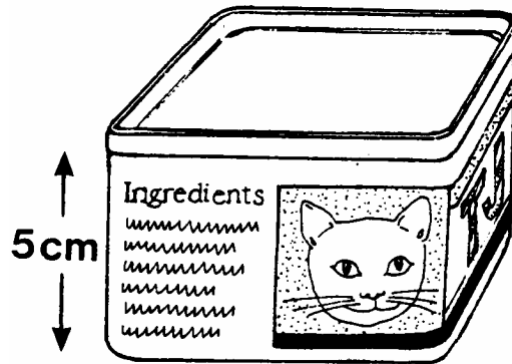
2 marks

- (d) At what time are the two aeroplanes the same distance from London?



1 mark

4. TJ's Cat Food is sold in tins shaped like this. Each tin has an internal height of 5 cm.



- (a) The area of the lid of the tin is 35 cm^2 .
Work out the volume of cat food that the tin contains.



..... cm^3

1 mark

- (b) The label that goes around the tin overlaps by 1 cm.
The area of the label is 134 cm^2 .



Work out the distance around the tin.

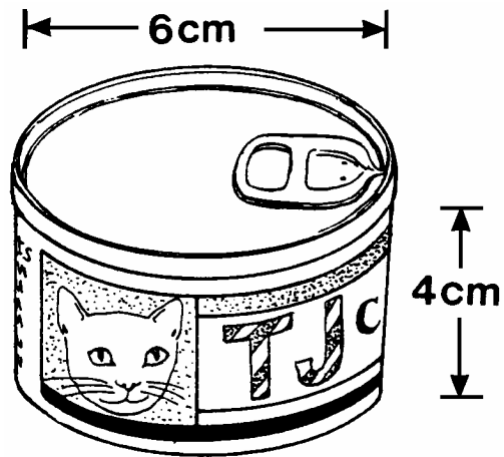
Show your working.



..... cm

2 marks

TJ's Cat Food plans to use tins that are the shape of cylinders. The internal measurements of a tin are shown.



(c) Work out the volume of cat food that the tin contains.

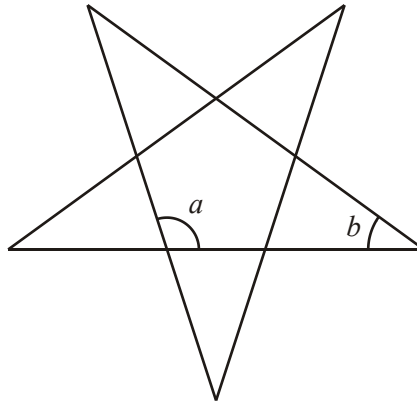
Show your working.



..... cm³

2 marks

5. The diagram shows the net for a right-pyramid with a regular pentagon as its base. The net is constructed using five straight lines.



- (a) Without measuring, explain why angle a must be 108°



1 mark

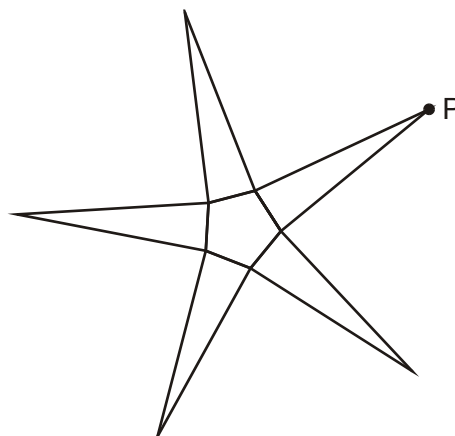
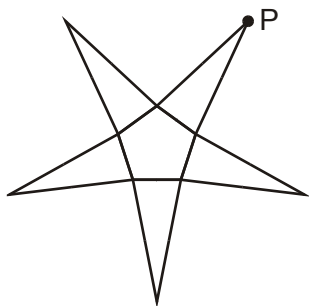
- (b) Calculate the size of angle b .
You **must** show your working.



.....^o

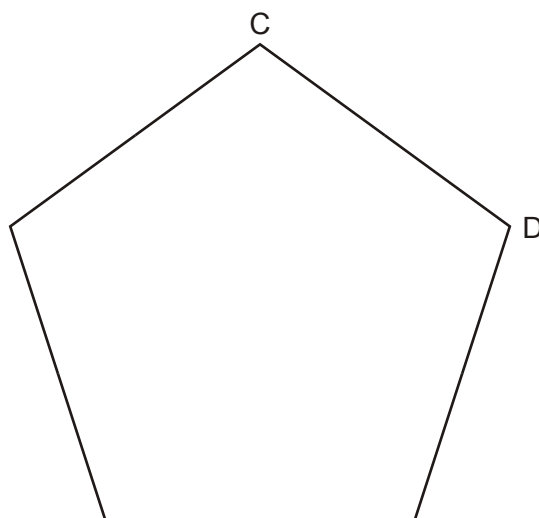
1 mark

- (c) On these nets, the point marked P lies on the perpendicular bisector of a side of the pentagon.



On side CD of the regular pentagon below, use compasses and a straight edge to **construct the perpendicular bisector**.

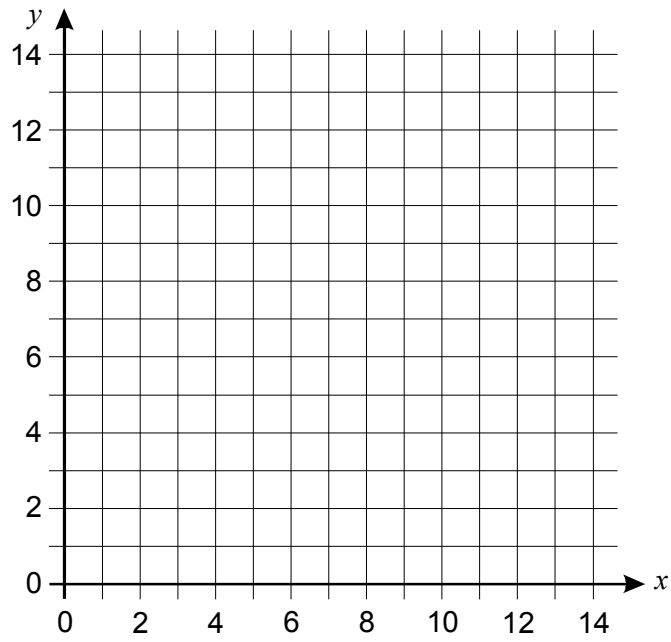
You **must** leave in your construction lines.



2 marks

6. (a) Each point on the straight line $x + y = 12$ has an x coordinate and a y coordinate that **add together** to make **12**

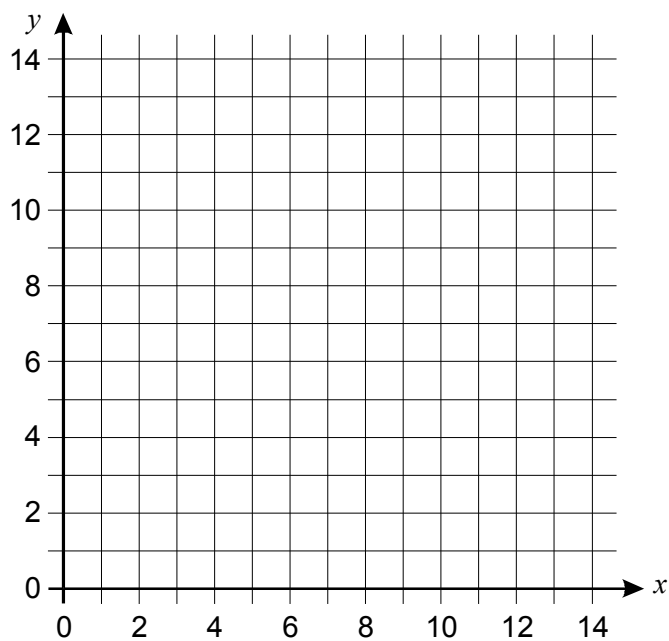
Draw the straight line $x + y = 12$



1 mark

- (b) Plot on the grid below at least 6 points whose x coordinate and y coordinate **multiply together** to make 12

Then draw the part of the curve $xy = 12$ that you would see on the grid below.

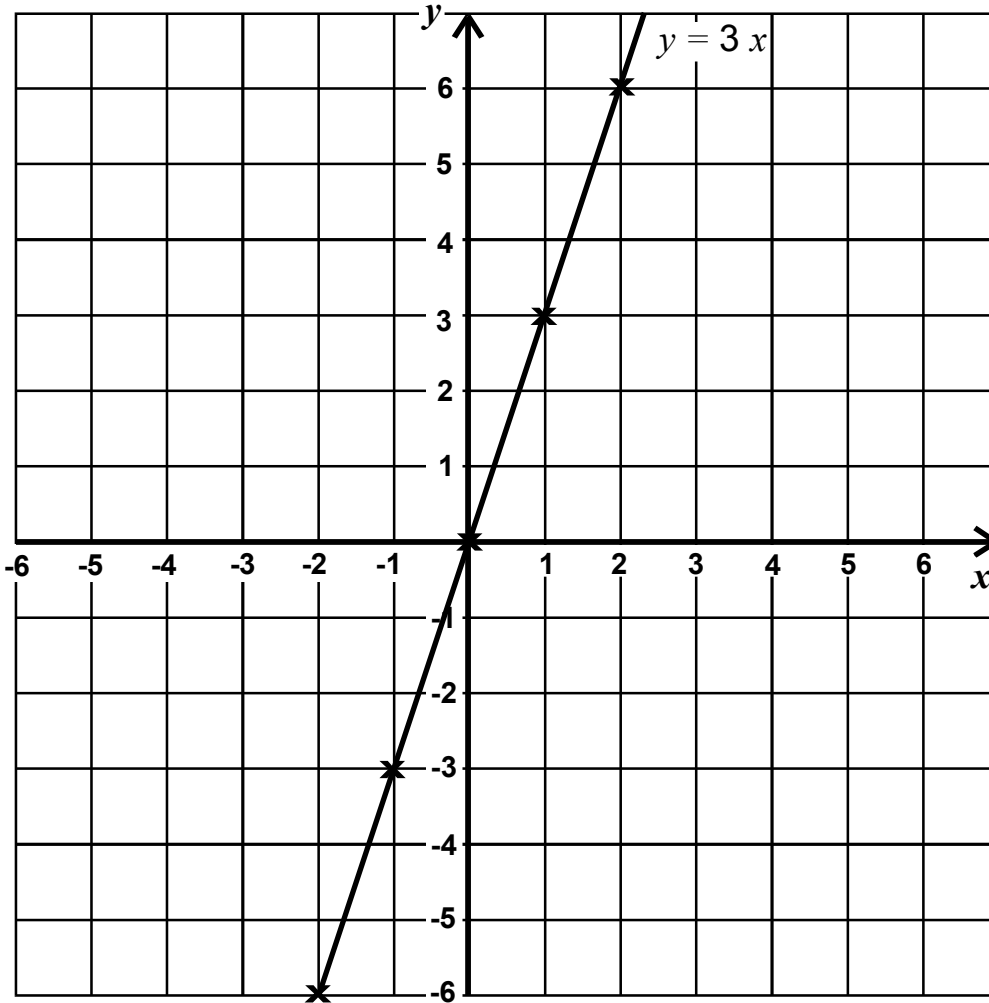


2 marks

7. The diagram shows the graph of the straight line $y = 3x$.

(a) Draw the graph of the straight line $y = 2x$.

Label your line $y = 2x$.



1 mark

(b) Write the equation of another straight line which goes through the point $(0, 0)$.



$y = \dots\dots\dots$

1 mark

- (c) The straight line with the equation $y = x - 1$ goes through the point **(4, 3)**.

On the diagram draw the graph of the straight line $y = x - 1$.

Label your line $y = x - 1$.

1 mark

- (d) Write the equation of the straight line which goes through the point $(0, -1)$ and is **parallel** to the straight line $y = 3x$.



$y = \dots\dots\dots$

1 mark

8.

Speed of light is about 1.1×10^9 km per hour
Speed of sound is about 1.2×10^3 km per hour

- (a) Calculate the speed of light in km per second.
Give your answer in standard form.

Show your working.



$\dots\dots\dots$ km per second

2 marks

- (b) How many times as fast as the speed of sound is the speed of light?
Give your answer to an appropriate degree of accuracy.

Show your working.



2 marks

- (c) Gary sees a flash of lightning.
25 second later he hears the sound of thunder.

Calculate how far away he is from the lightning.
(You do **not** need to include the speed of light in your calculation).

Show your working.



..... km

2 marks

9. (a) One calculation below gives the answer to the question

What is 70 increased by 9%?

Tick (✓) the correct one.

70×0.9

70×1.9

70×0.09

70×1.09

1 mark

Choose one of the other calculations.

Write a question **about percentages** that this calculation represents.



calculation chosen:

question it represents:

1 mark

Now do the same for one of the remaining two calculations.



calculation chosen:

question it represents:

1 mark

(b) Fill in the missing decimal number.



To decrease by 14%, multiply by

1 mark

(c) A **10% increase** followed by **another 10% increase** is **not** the same as a total increase of 20%

What is the total percentage increase?

Show your working.



..... %

2 marks

10. A teacher asked fifty pupils in Year 9:

How much time did you spend on homework last night?

Results

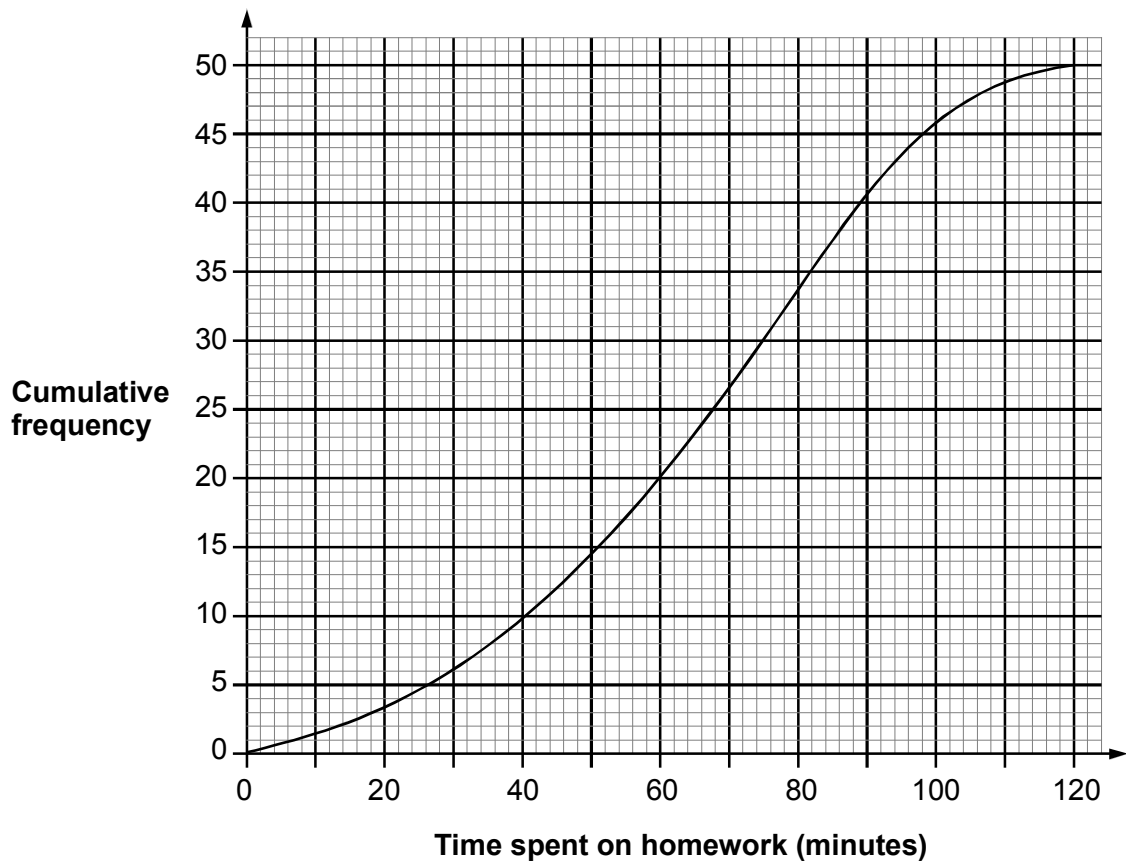
Time spent on homework (minutes)	Frequency
$0 \leq \text{time} \leq 30$	6
$30 < \text{time} \leq 60$	14
$60 < \text{time} \leq 90$	21
$90 < \text{time} \leq 120$	9
Total	50

- (a) Show that an estimate of the **mean** time spent on homework is **64.8 minutes**.



2 marks

The teacher used the data to draw a cumulative frequency diagram.



(b) Use the diagram to estimate the **median** time pupils spent on their homework.

Show on the diagram how you get your answer.



..... minutes

2 marks

(c) Use the diagram to estimate how many pupils spent **more than 100 minutes** on their homework.

Show how you get your answer.



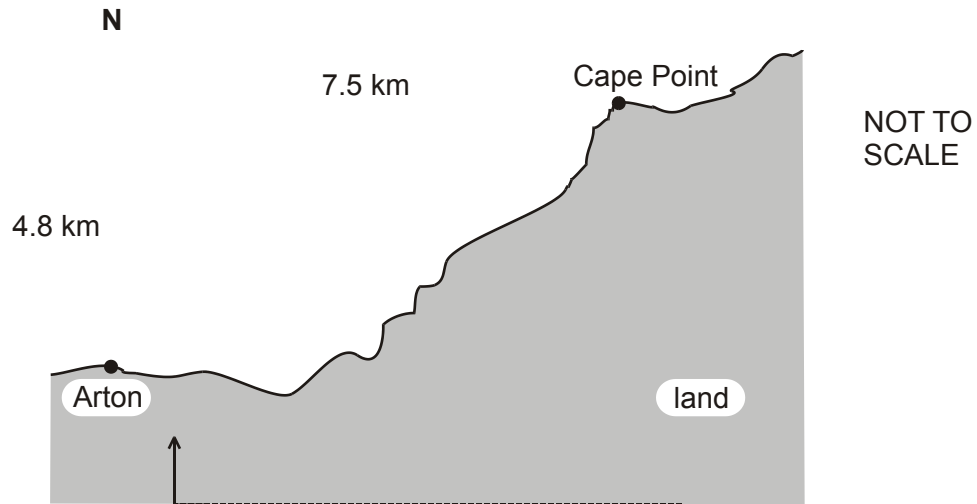
..... pupils

2 marks

11.

In this question you will get no marks if you work out the answer through scale drawing.

(a) Cape Point is 7.5km east and 4.8km north of Arton.



Calculate the direct distance from Arton to Cape Point.

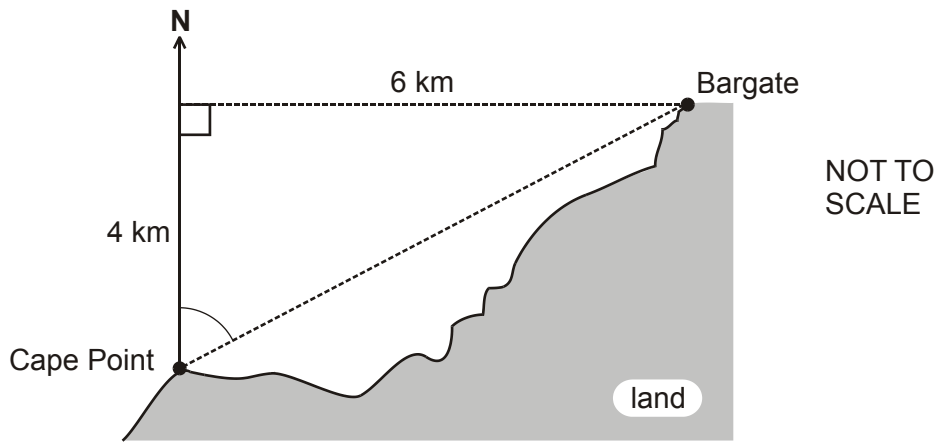
Show your working.



..... km

2 marks

Bargate is 6km east and 4km north of Cape Point.



- (b) Steve wants to sail directly from Cape Point to Bargate. On what bearing should he sail?

Show your working.



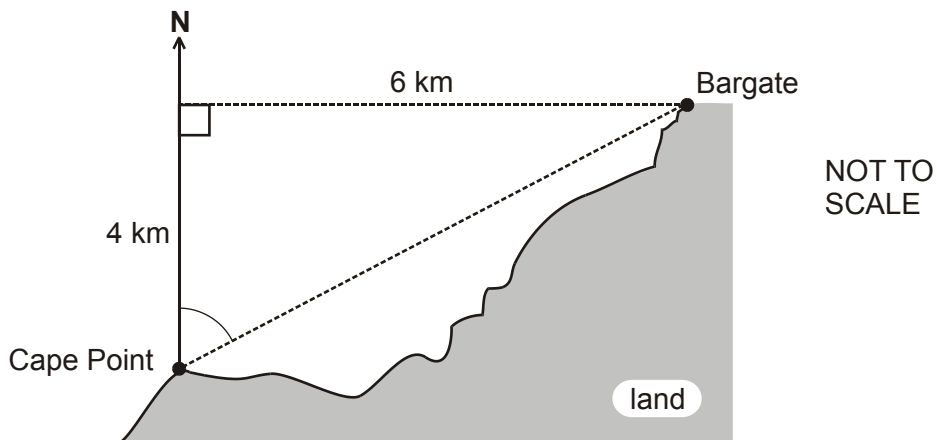
.....°

2 marks

- (c) Anna sails from Cape Point on a bearing of 048° . She stops when she is due north of Bargate.

How far north of Bargate is Anna?

Show your working.



..... km

3 marks

12. Each year a school has a concert of readings and songs.

In 1999 the concert had 3 readings and 9 songs.
It lasted 120 minutes.

In 2000 the concert had 5 readings and 5 songs.
It lasted 90 minutes.

In 2001 the school plans to have 5 readings and 7 songs.

Use simultaneous equations to estimate how long the concert will last.

Call the time estimated for a reading x minutes, and the time estimated for a song y minutes.

You **must** show your working.

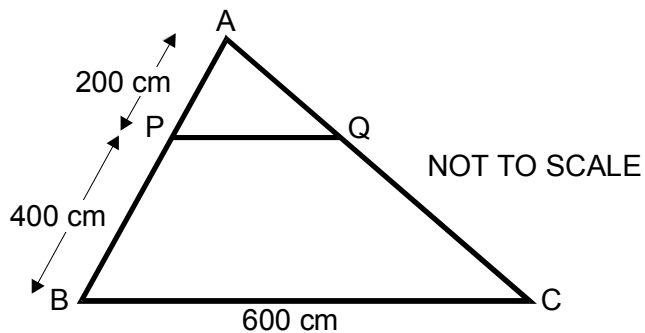


Estimated time = minutes

4 marks

13. Timpkins Builders make wooden frames for roofs on new houses.

In the diagram of the wooden frame shown below, PQ is parallel to BC.



(a) Calculate length PQ using similar triangles.

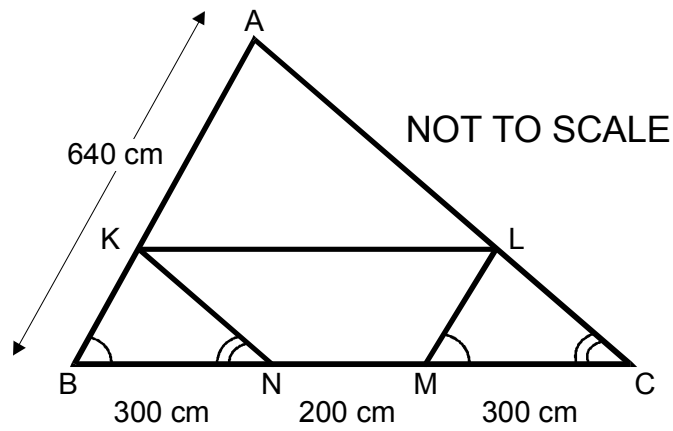
Show your working.



..... cm

2 marks

In the diagram of the wooden frame shown below, angle $ABC = \text{angle } LMC$, and angle $ACB = \text{angle } KNB$.



(b) Calculate length LM using similar triangles.

Show your working.



..... cm

2 marks

END OF EXAMINATION