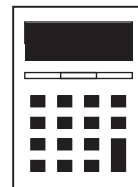


GCSE MATHEMATICS

Trigonometry

Problems



AQA  These questions have been taken or modified from previous AQA GCSE Mathematics Papers.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer all questions.
- You must answer the questions in the spaces provided.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in questions that are indicated with an asterisk (*).

Advice

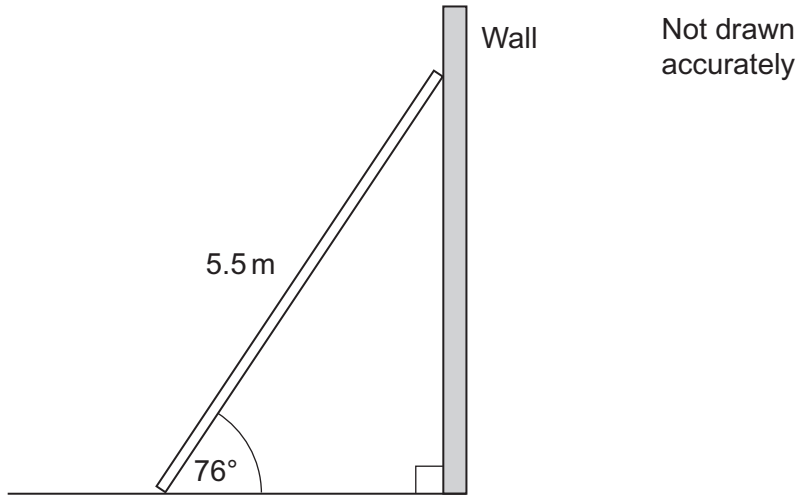
- Read each question carefully before you start to answer it.
 - In all calculations, show clearly how you work out your answer.
 - Use the number of marks for the question as a guide to the amount of time you need to spend.
 - Look at previous parts of the question, e.g. a), b), c) i) as there may be information there you need to answer later parts.
 - Check your answer is realistic and appropriate.
 - For calculator decimal numbers always write your full calculator display in the working out area and then, if you need to, round the answer on the answer line.
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This booklet was curated and modified using AQA examination papers between 2010-2016, for thecalculatorguide.com, where you can find many more booklets on further topics. All questions used are reproduced for educational purposes only.



www.thecalculatorguide.com

- 1 The diagram shows a ladder leaning against a wall.
The ladder is 5.5 metres long.



Safety recommendations say that the angle between the ladder and the ground is 76° .

Work out how far up the wall the ladder reaches.

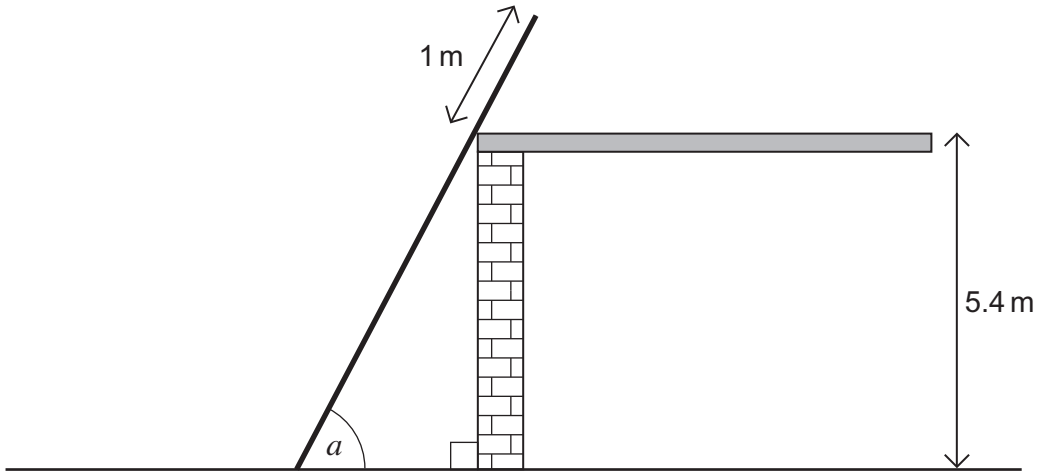
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Answer m (3 marks)

- *2 A flat roof is 5.4 metres high.
A ladder leans against the roof.
The length of the ladder is 6.5 metres.



Not drawn accurately

For a ladder to be used safely

angle a should be between 74° and 76°

Can the ladder be used safely in the position shown?
You **must** show your working.

[4 marks]

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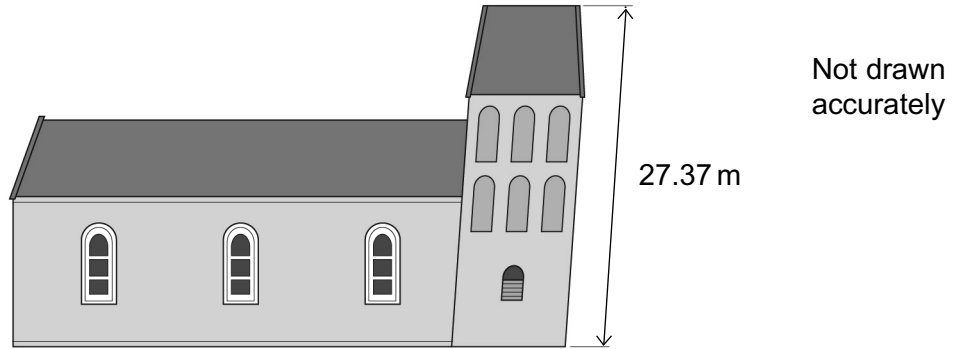
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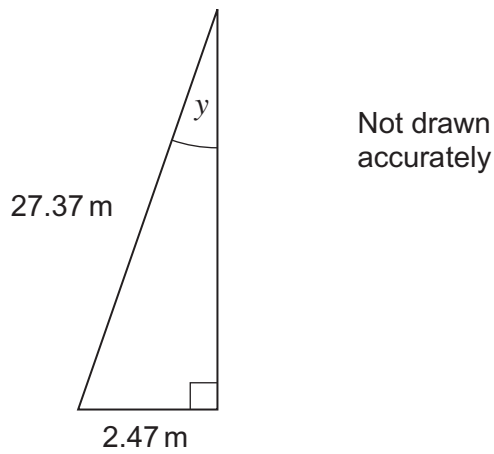
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3 A church tower leans at an angle.



The diagram below shows the angle, y , at which the tower leans.



Work out angle y .

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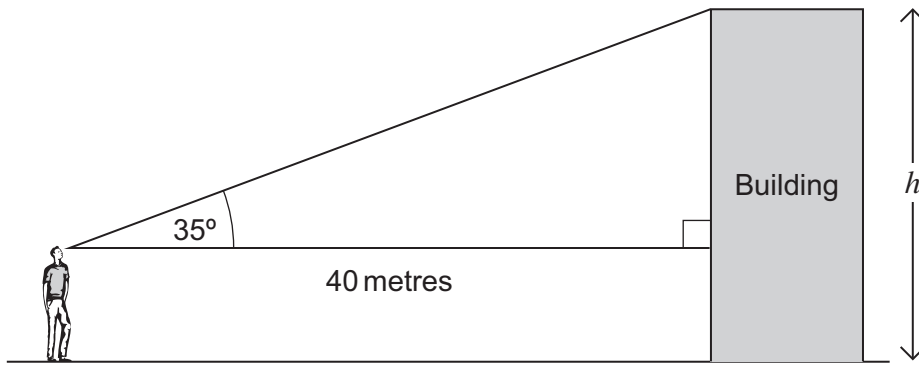
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Answer degrees (3 marks)

Not drawn accurately



The man is 1.8 metres tall.

Work out the height of the building, marked h on the diagram.
Give your answer to a suitable degree of accuracy.

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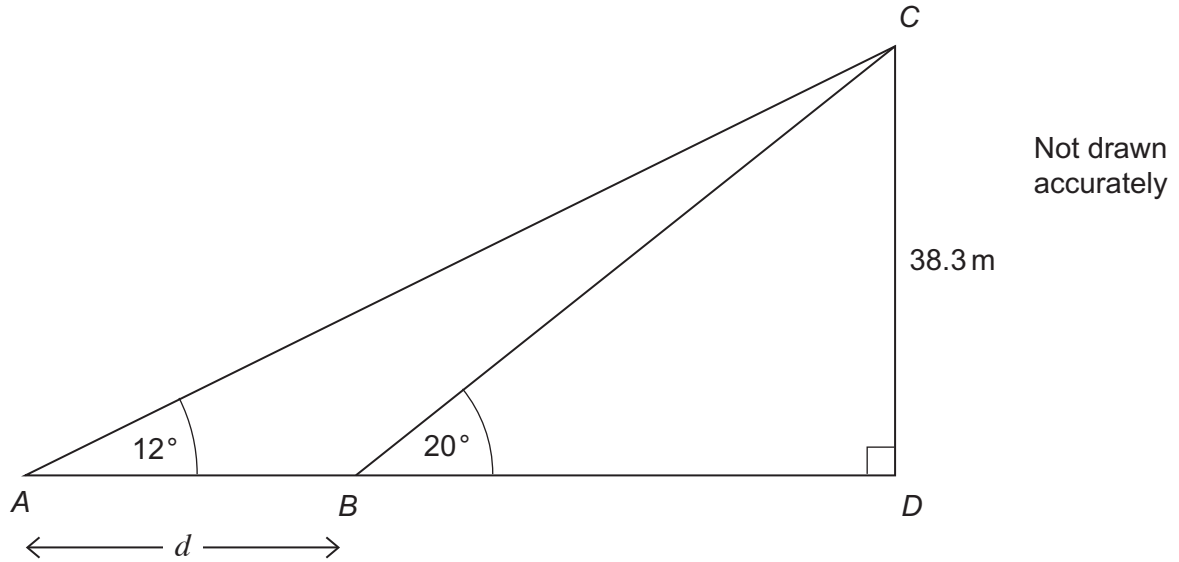
Answer metres (5 marks)

- 5 The diagram shows two positions, A and B , of a boat sailing directly towards a lighthouse, CD .



- The vertical height of the lighthouse is 38.3 m
- The angle of elevation of C from A is 12°
- The angle of elevation of C from B is 20°

This information can be modelled by the diagram below.



Work out d , the distance the boat sails between A and B .

[5 marks]

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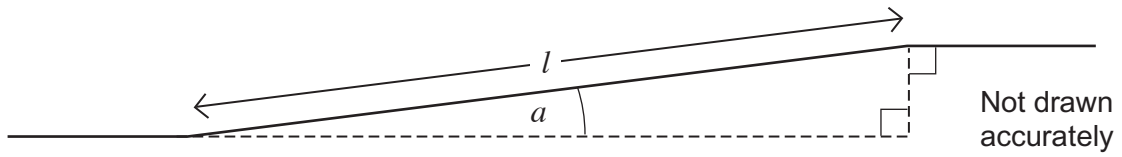
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Answer m

6 The diagram shows a sketch of a **single** ramp for a wheelchair.



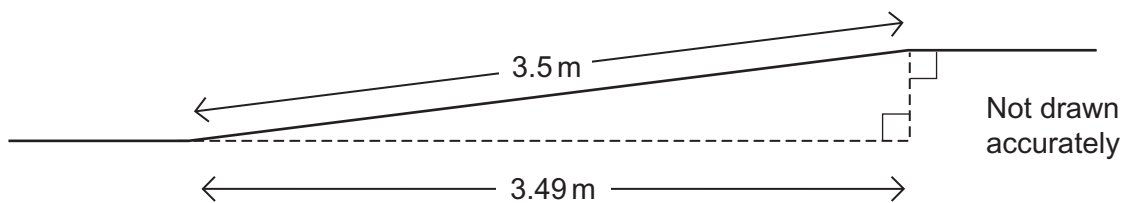
l is the length of the ramp in metres.

a is the size of the angle between the ramp and the horizontal in degrees.

Here are some rules about the sizes of l and a .

Length, l	Maximum size of a
$l \leq 2$	4.75°
$2 < l \leq 5$	3.80°
$5 < l \leq 10$	2.85°

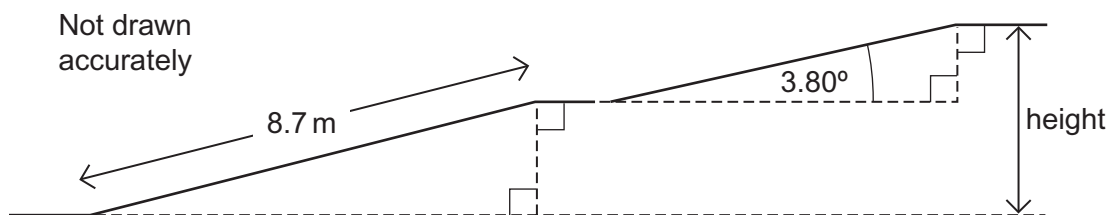
6 (a) Does this ramp follow the rules?



You **must** show your working.

[3 marks]

6 (b) The diagram shows a sketch of a **double** ramp for a wheelchair.



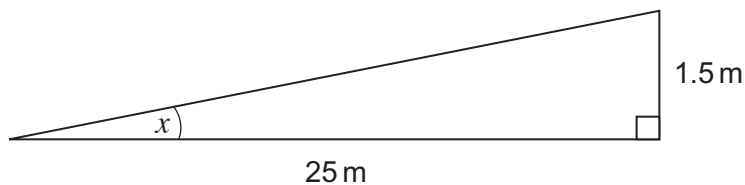
Each part of the ramp follows the rules for a single ramp.

Work out the **maximum** possible height of the double ramp.
You **must** show your working.

[5 marks]

Answer _____ metres

7 (a) A ramp for hand-propelled wheelchairs is shown.



Not drawn accurately

Work out the size of angle x to 1 decimal place.

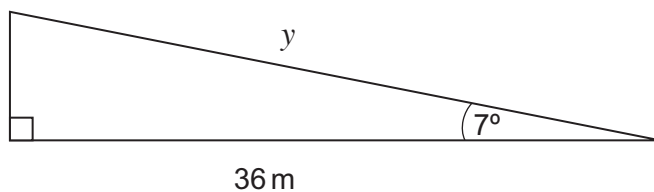
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Answer degrees (4 marks)

7 (b) A ramp for powered wheelchairs is shown.



Not drawn accurately

Work out length y .

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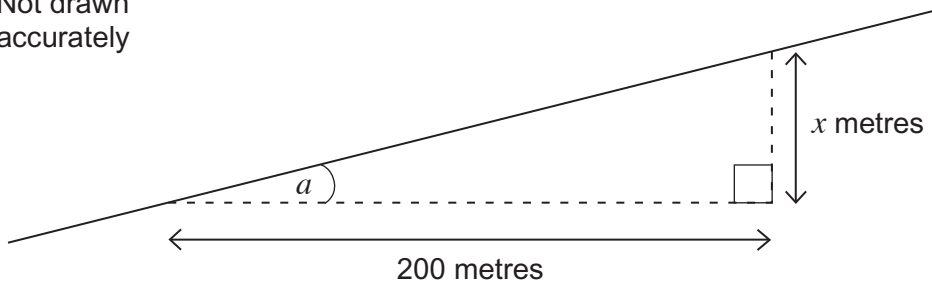
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Answer m (3 marks)

- 8 The diagram shows a section of a railway line with gradient $\frac{1}{37}$

Not drawn accurately



- 8 (a) Work out the value of x .
Give your answer to 3 significant figures.

[3 marks]

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Answer

- 8 (b) Work out the size of angle a .

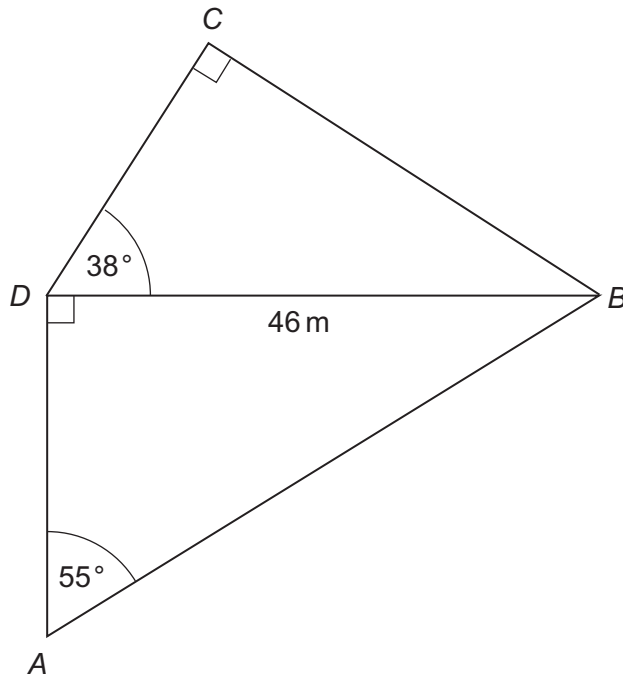
[3 marks]

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Answer degrees

9

The diagram shows five straight paths.



Not drawn accurately

Harry walks along paths AD and DC .

Work out the total distance he walks.

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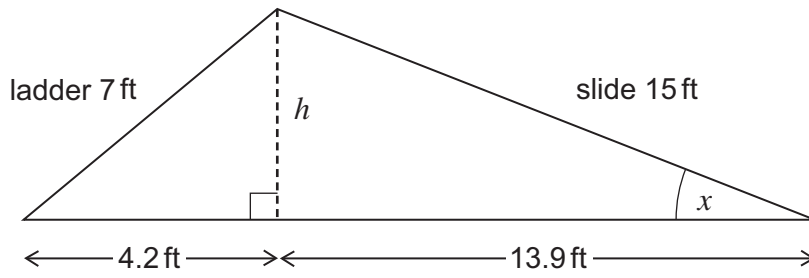
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Answer m (6 marks)

10 Here is a side view of a ladder and slide.
All dimensions are in feet (ft).



Not drawn accurately

10 (a) The ladder is safe if

the top of the ladder is less than 6 feet above the ground.

Show that the ladder is safe.

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(3 marks)

10 (b) The slide is safe if

the maximum value of angle x is 24° .

Show that the slide is safe.

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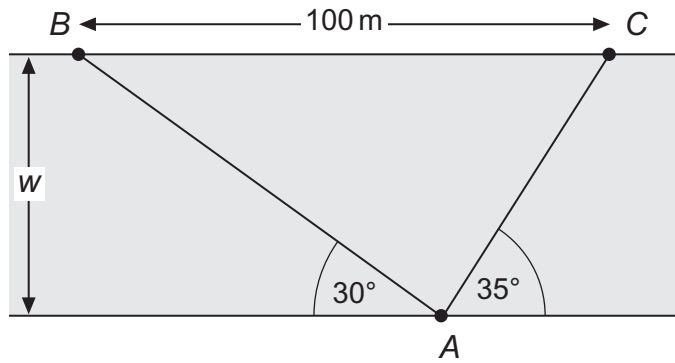
(3 marks)

11

Max stands at a point A on the bank of a river with parallel straight sides.

He can see two posts at B and C on the other side of the river.
He knows the posts are 100 metres apart.

The angle between the bank and the line AB is 30° .
The angle between the bank and the line AC is 35° .



Not drawn accurately

Work out the width of the river, w .

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Answer m (5 marks)