Pythagoras' Theorem (H)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	
Total Marks:	

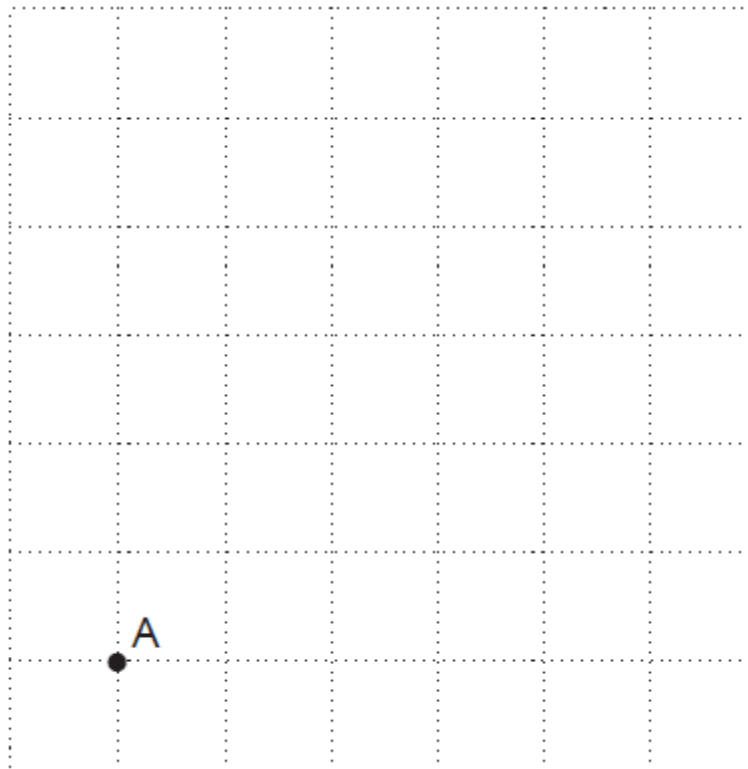1. The lengths of the sides of a right-angled triangle are all integers.

   Prove that if the lengths of the two shortest sides are even, then the length of the third side must also be even.

   [3]

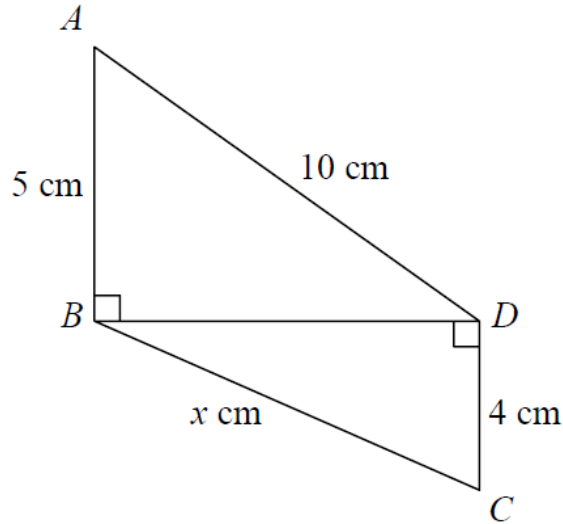2. The point A is shown on the unit grid below.

   The point B is $2\sqrt{5}$ units from A and lies on the intersection of two grid lines.

   Mark one possible position for B.

   [3]

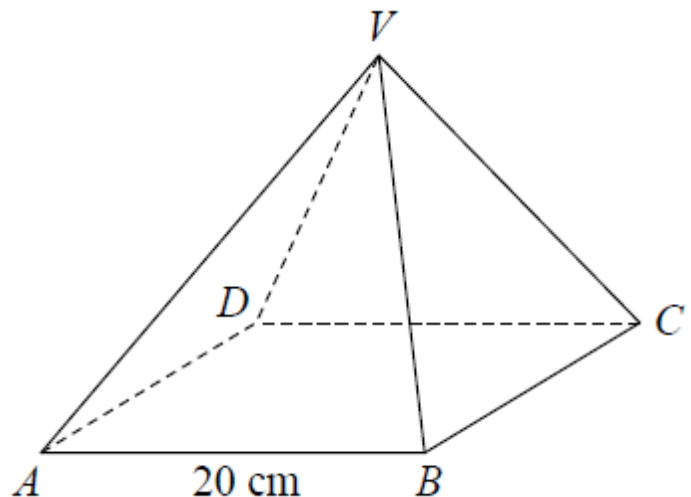3. Triangles ABD and BCD are right-angled triangles.

Work out the value of x.

Give your answer correct to 2 decimal places.

.... [4]

4. VABCD is a solid pyramid.

ABCD is a square of side 20 cm.

The angle between any sloping edge and the plane ABCD is 55°

Calculate the surface area of the pyramid.
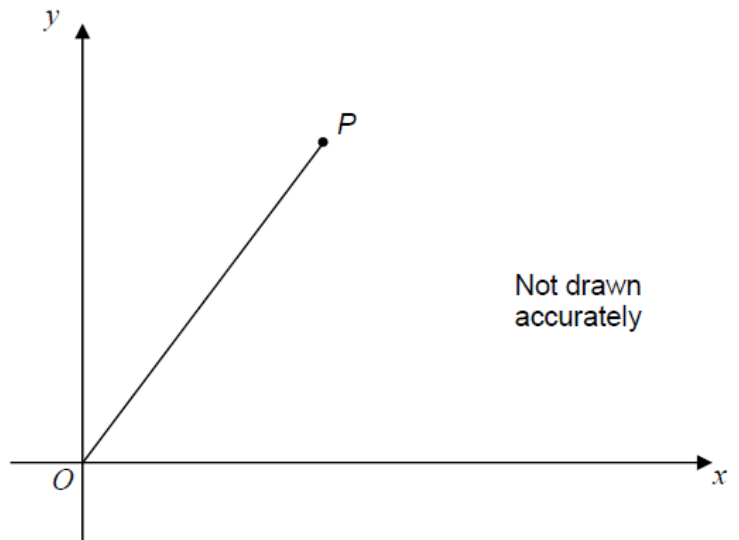
Give your answer correct to 2 significant figures.

....cm² [5]

5. The diagram shows a line joining O to P.

The gradient of the line is 2

The length of the line is √2645

Work out the coordinates of P.

Not drawn accurately

[4]

6. The rectangle ABCD represents a park.
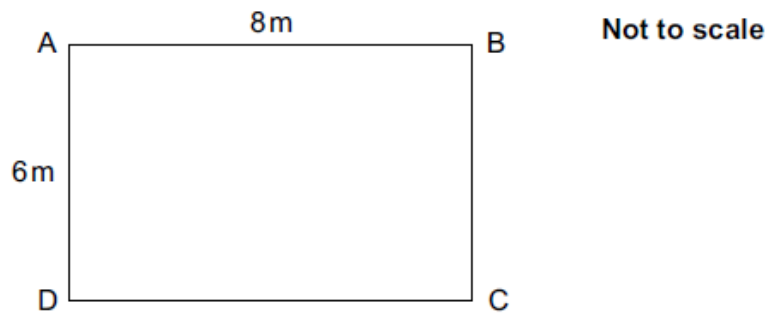

Not to scale

40m

60m
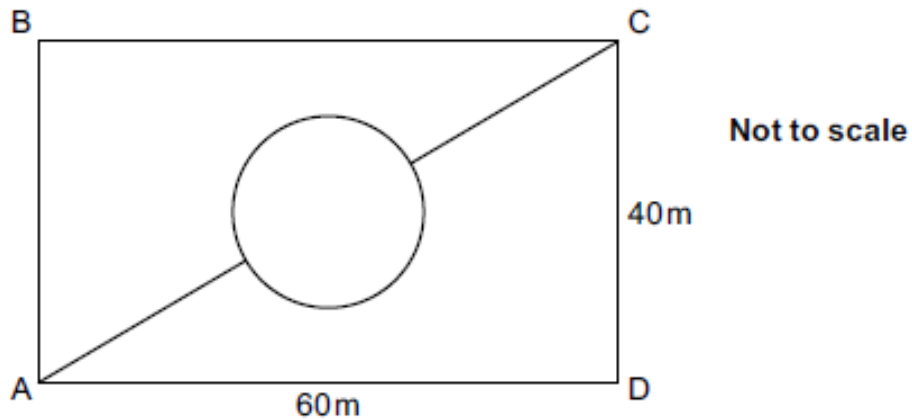
The lines show all the paths in the park.

The circular path is in the centre of the rectangle and has a diameter of 10m.

Calculate the shortest distance from A to C across the park, using only the paths shown.

.... m [6]

7. ABCD is a rectangle.

8m   Not to scale

A _____ B

6m

D _____ C

(a) Sunita calculates the length of AC, but gets it wrong.

$$8^2 - 6^2 = AC^2$$

$$\sqrt{28} = AC$$

$$\sqrt{28} = 5.29 \text{ or } ^-5.29$$

$$AC = 5.29$$

Explain what Sunita has done wrong.

[1]

(b) Calculate the length of AC.

.... m [2]

8. A triangle has sides of length 23.8 cm, 31.2 cm and 39.6 cm.

Is this a right-angled triangle?

Show how you decide.
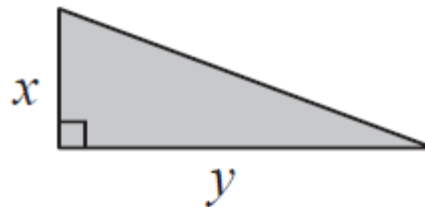
[4]

6. Triangle ABC has perimeter 20 cm.
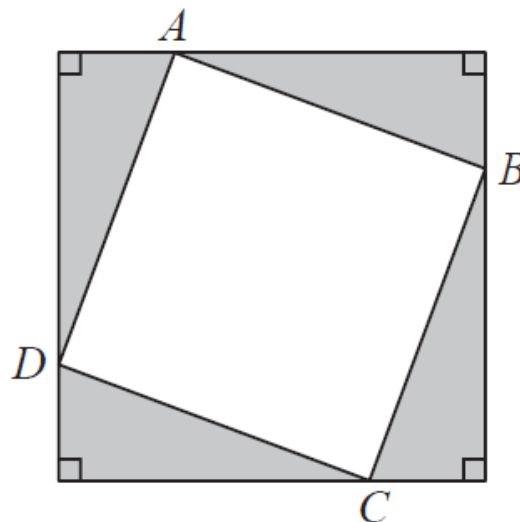
   AB = 7 cm.

   BC = 4 cm.

   By calculation, deduce whether triangle ABC is a right-angled triangle.

[4]

7. Here is a right-angled triangle.

Four of these triangles are joined to enclose the square *ABCD* as shown below.

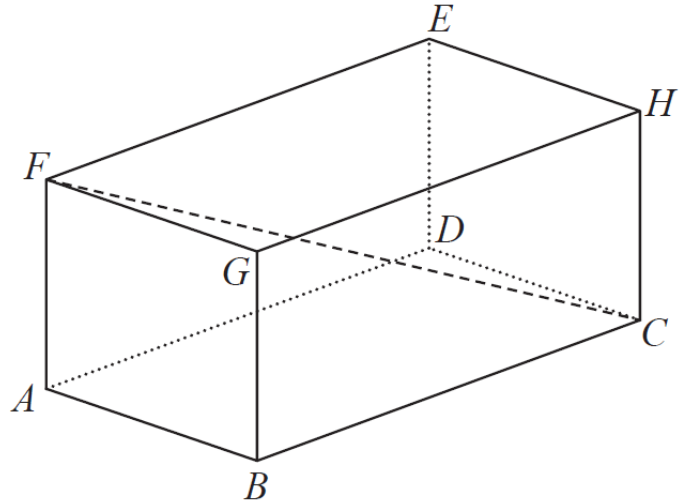Show that the area of the square *ABCD* is $x^2 + y^2$

[3]

11. The diagram shows a cuboid *ABCDEFGH*.

AB = 7 cm, *AF* = 5 cm and *FC* = 15 cm.

Calculate the volume of the cuboid.

Give your answer correct to 3 significant figures.

.... cm³ [4]

12
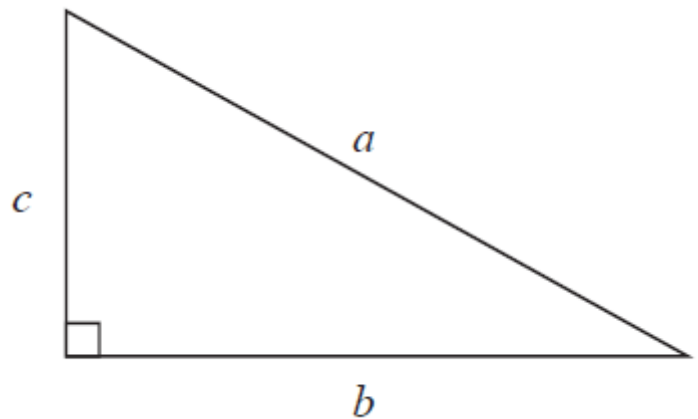
a is 8.3 cm correct to the nearest mm

b is 6.1 cm correct to the nearest mm

Calculate the upper bound for c.

You must show your working.

.... cm [4]

13. A circle has diameter 10 cm

A square has side length 6 cm

Not drawn
accurately

10 cm

6 cm
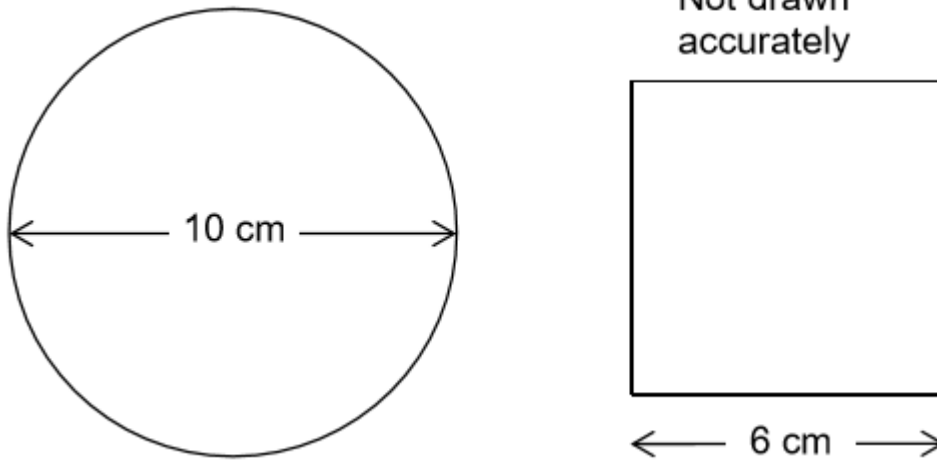
Use Pythagoras' theorem to show that the square will fit inside the circle without touching the edge of the circle.

[3]

14. The area of a right-angled, isosceles triangle is 4 cm^2

Work out the perimeter of the triangle in centimetres.   Give your answer in the form $a + b\sqrt{c},$ where a, b and c are integers.

[4]

15. Which of these points is not 5 units from the point (0, 0)?   Circle your answer.

[1]

(−5, 0)   (1, 4)   (3, 4)   (0, 5)

CREDITS AND NOTES

Q	Awarding Body	Q	Awarding Body	Q	Awarding Body
1	OCR	8	OCR	15	AQA
2	OCR	9	Pearson Edexcel		
3	Pearson Edexcel	10	Pearson Edexcel		
4	Pearson Edexcel	11	Pearson Edexcel		
5	AQA	12	Pearson Edexcel		
6	OCR	13	AQA		
7	OCR	14	AQA		

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material