AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

F

Foundation Tier Unit 3 Geometry and Algebra

Tuesday 14 June 2016 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.

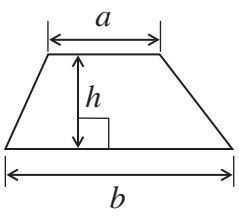
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.
- If your calculator does not have a π 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 maximum mark for this paper is 80.
- Quality of your written communication is specifically assessed in Questions 15 and 18. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

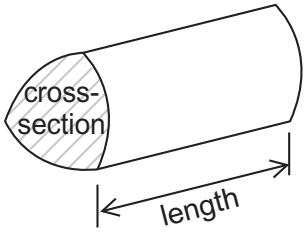
Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

Area of trapezium = $\frac{1}{2}(a+b)h$

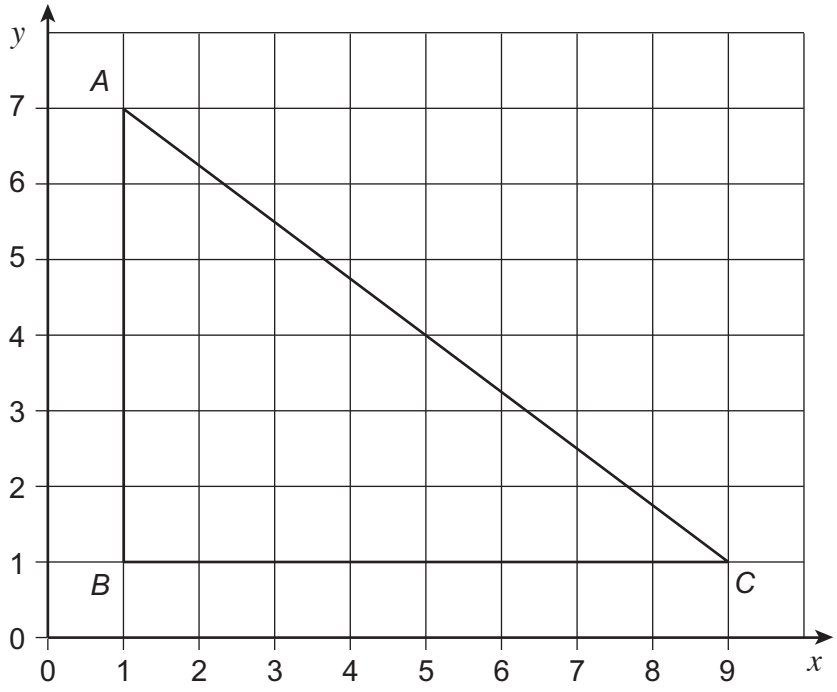


Volume of prism = area of cross-section × length



Answer **all** questions in the spaces provided.

1 Triangle *ABC* is shown on this centimetre grid.



1 (a) Measure the length of the side *AC*.
Give your answer in centimetres.

[1 mark]

Answer _____ cm

1 (b) Work out the perimeter of the triangle.

[2 marks]

_____

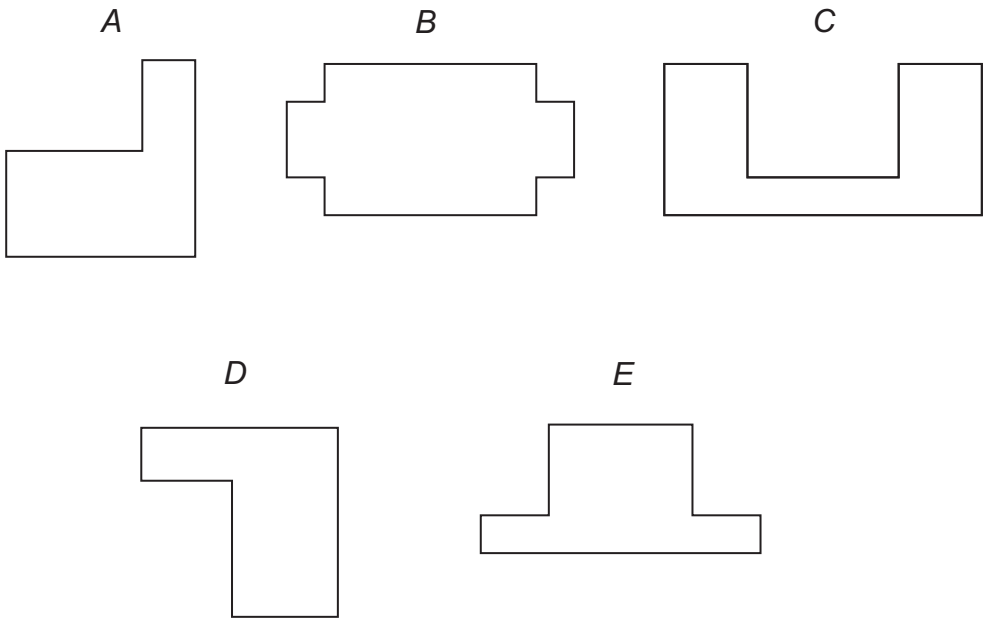
_____

Answer _____ cm

3

Turn over ▶

2 Here are five shapes.



2 (a) Which shape has the most vertices?
Circle your answer.

[1 mark]

A *B* *C* *D* *E*

2 (b) Which **two** shapes are octagons?
Circle your answers.

[1 mark]

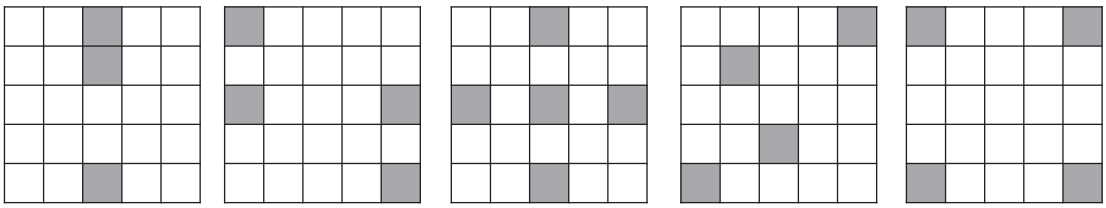
A *B* *C* *D* *E*

2 (c) Which **two** shapes are congruent?
Circle your answers.

[1 mark]

A *B* *C* *D* *E*

3 *A*, *B*, *C*, *D* and *E* are square grids.
Some squares have been shaded in each grid.



A *B* *C* *D* *E*

3 (a) Which **two** grids have four lines of symmetry?

[2 marks]

Answer _____ and _____

3 (b) Which **three** grids have rotational symmetry?

[2 marks]

Answer _____ and _____ and _____

3 (c) Which grid has line symmetry but **not** rotational symmetry?

[1 mark]

Answer _____

8

4 Here is a map.

Scale 1 cm represents 125 km

4 (a) Which city on the map is South-West of Madrid?
Circle your answer.

[1 mark]

Porto Sevilla Almeria Valencia Barcelona

4 (b) Which city on the map is North-East of Valencia?
Circle your answer.

[1 mark]

Porto Sevilla Almeria Madrid Barcelona

4 (c) The scale of the map is 1 cm represents 125 km

Work out the actual distance between Barcelona and Madrid.

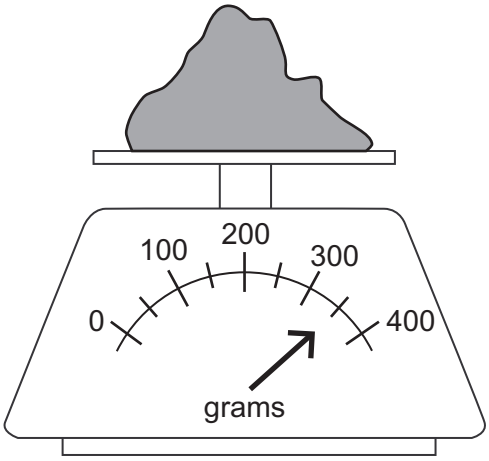
[3 marks]

Answer _____ km

Turn over for the next question

5

5 The diagram shows some flour on weighing scales.



5 (a) How much does the flour weigh?

[1 mark]

Answer _____ grams

5 (b) Gino needs 0.6 kilograms of flour.
The scales can weigh up to 400 grams.

How can he use the scales to weigh 0.6 kilograms of flour?

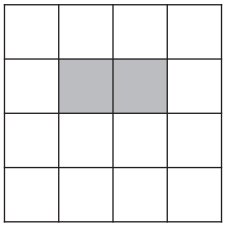
[2 marks]

_____

_____

_____

6 (a) What fraction of this square grid is shaded?

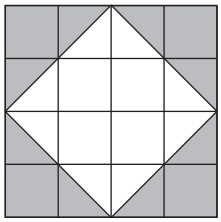


Circle the **two** correct answers.

[2 marks]

$\frac{1}{7}$ $\frac{1}{8}$ $\frac{2}{14}$ $\frac{2}{16}$ $\frac{7}{8}$ $\frac{14}{16}$

6 (b) The diagram shows a square grid.



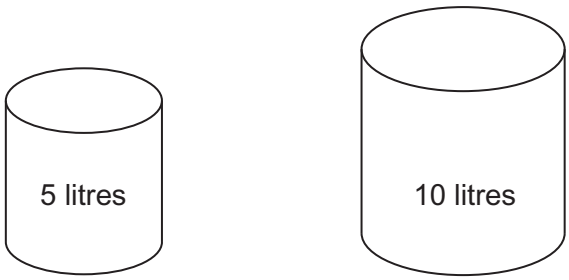
What percentage of this grid is shaded?

[2 marks]

Answer _____ %

7

7 Paint is sold in 5-litre tins and 10-litre tins.



£26.00 £45.50

7 (a) A decorator buys four 10-litre tins.

How many 5-litre tins could she buy for the same amount?
You **must** show your working.

[3 marks]

Answer _____

7 (b) Dan buys five tins of paint for £169

How many tins of each size does he buy?

[2 marks]

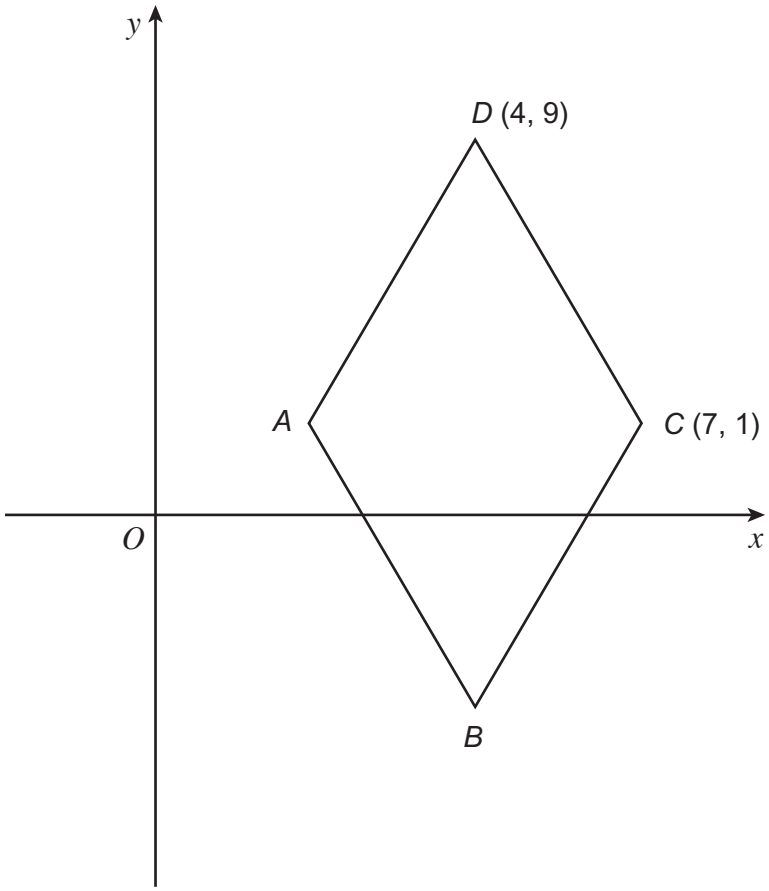
Answer _____ 5-litre tins

and _____ 10-litre tins

Turn over for the next question

5

8 *ABCD* is a rhombus.
AC is parallel to the x-axis.



Not drawn accurately

8 (a) Work out the coordinates of *A*.

[2 marks]

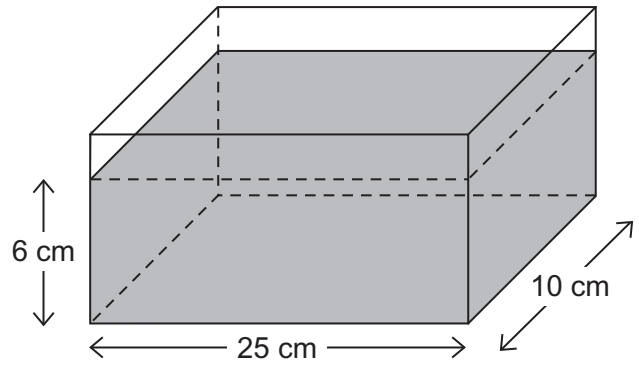
Answer (_____ , _____)

8 (b) Work out the coordinates of *B*.

[2 marks]

Answer (_____ , _____)

9 The diagram shows a water tank in the shape of a cuboid.



The height of the water in the tank is 6 cm
Water leaks from the bottom of the tank at the rate of 30 cm^3 per minute.

How many minutes will it take the tank to empty?

[3 marks]

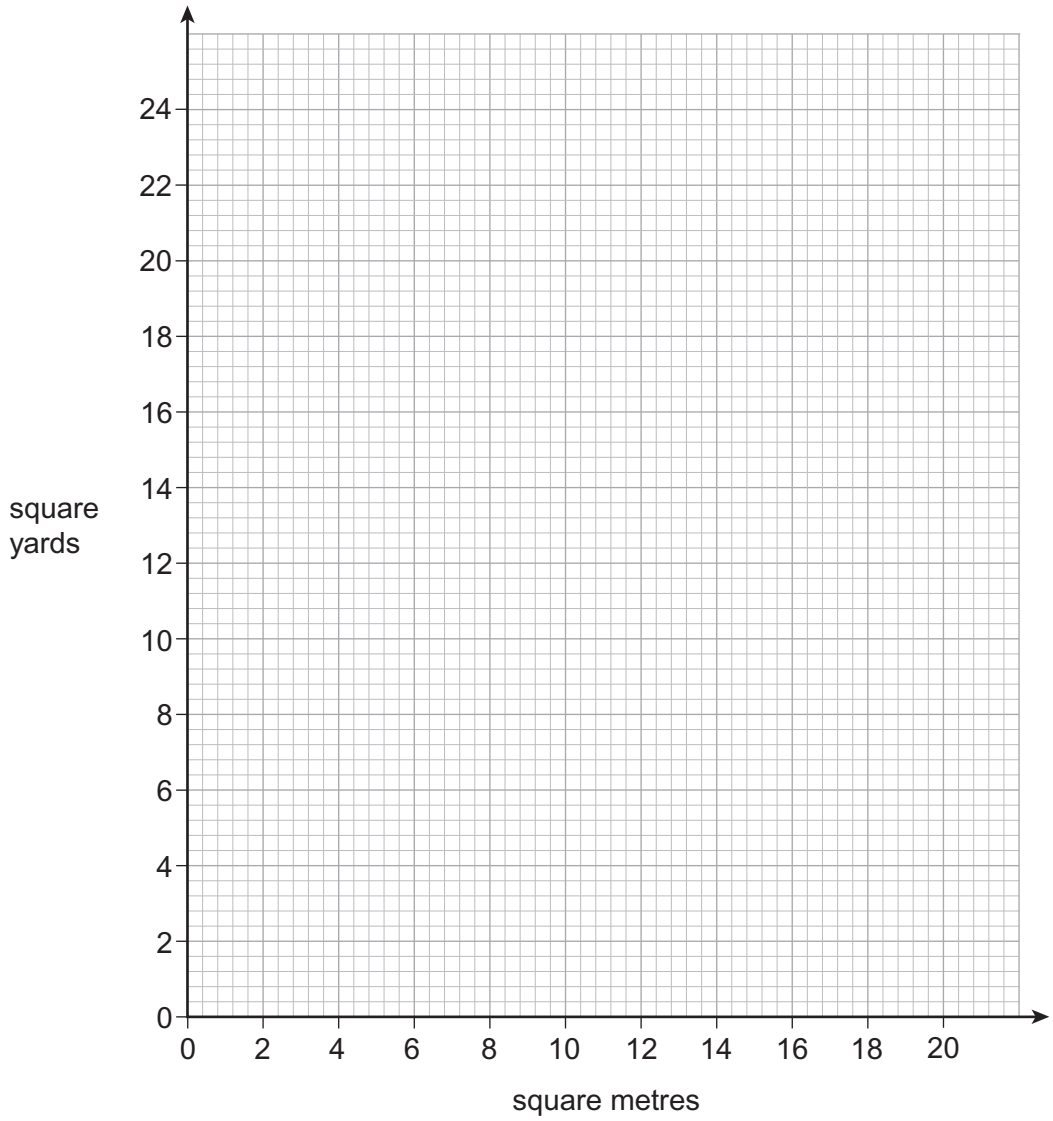
Answer _____ minutes

7

10 10 square metres = 12 square yards

10 (a) Draw a conversion graph between square metres and square yards.

[2 marks]



10 (b) How many square metres are equal to 18 square yards?
Circle your answer.

[1 mark]

15 16 21 22

10 (c) The value of a piece of land is worked out using the formula

$$V = 25A$$

V is the value in £
A is the area of the land in square **yards**.

The area of a piece of land is 400 square **metres**.

Work out the value of the piece of land.

[3 marks]

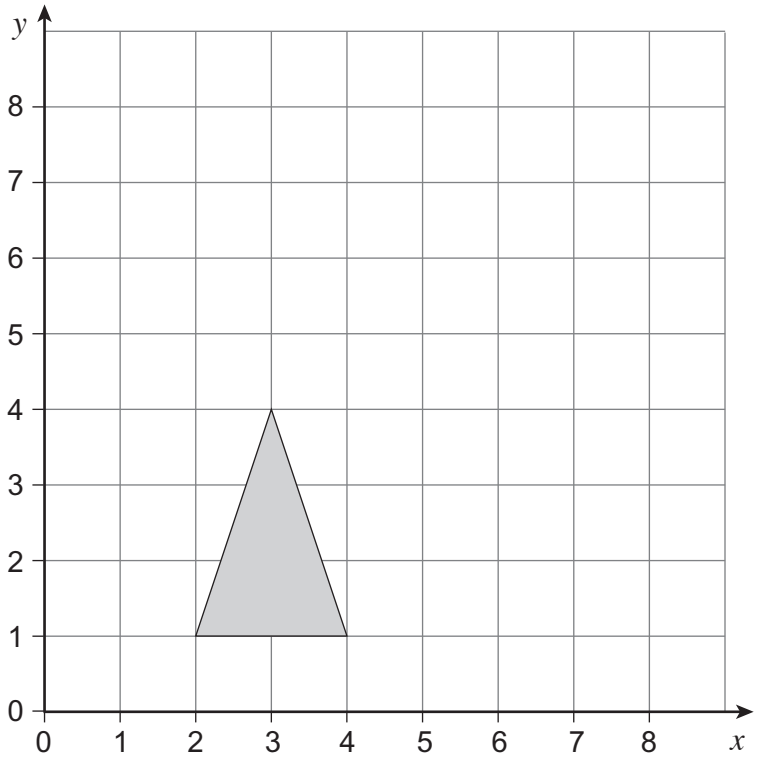
Answer £ _____

Turn over for the next question

6

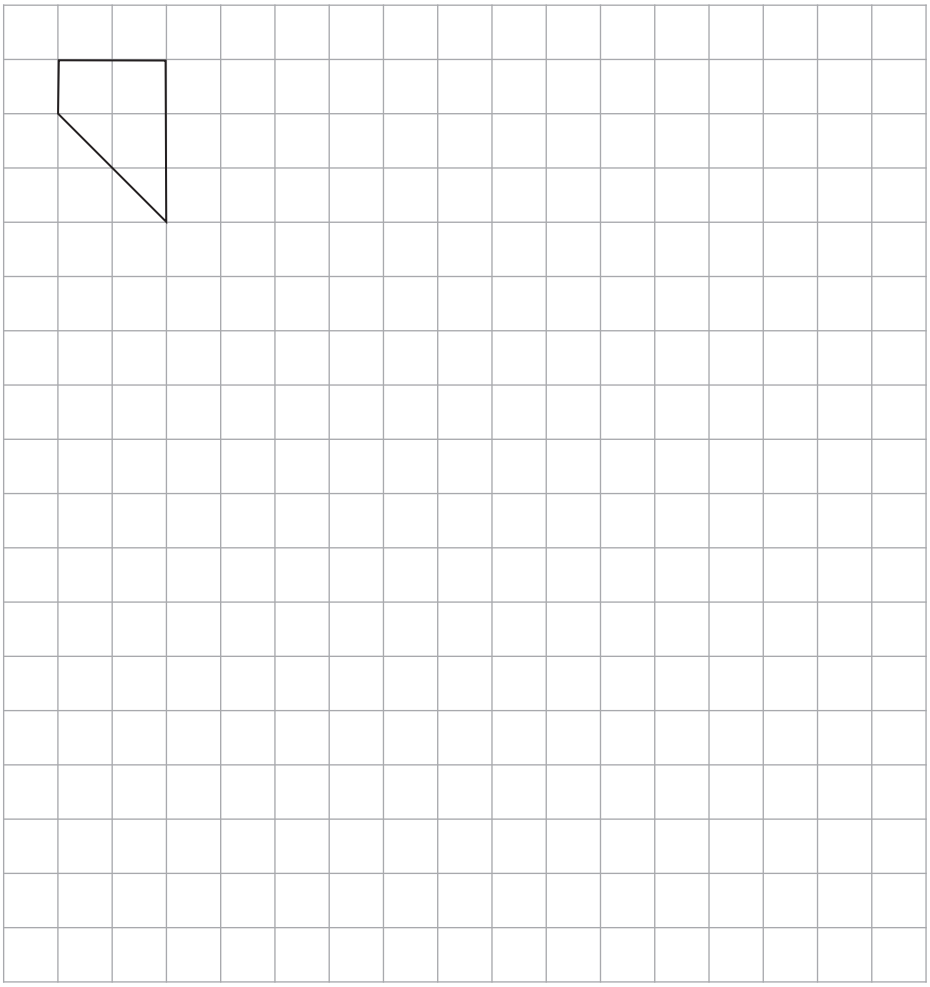
11 (a) Reflect this triangle in the line $y = 4$

[2 marks]



11 (b) Enlarge this shape by scale factor 3

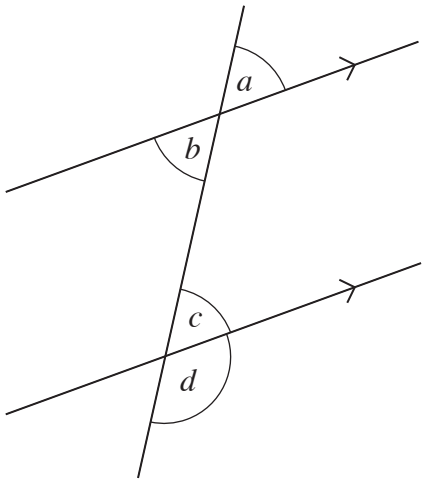
[2 marks]



Turn over for the next question

4

12



12 (a) Which angles are vertically opposite?
Circle your answer.

[1 mark]

a and *b* | *a* and *c* | *b* and *c* | *b* and *d* | *c* and *d*

12 (b) Which angles are alternate?
Circle your answer.

[1 mark]

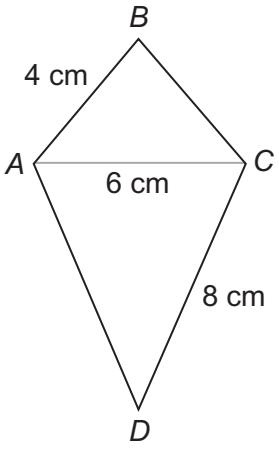
a and *b* | *a* and *c* | *b* and *c* | *b* and *d* | *c* and *d*

12 (c) Which angles are corresponding?
Circle your answer.

[1 mark]

a and *b* | *a* and *c* | *b* and *c* | *b* and *d* | *c* and *d*

13 *ABCD* is a kite.



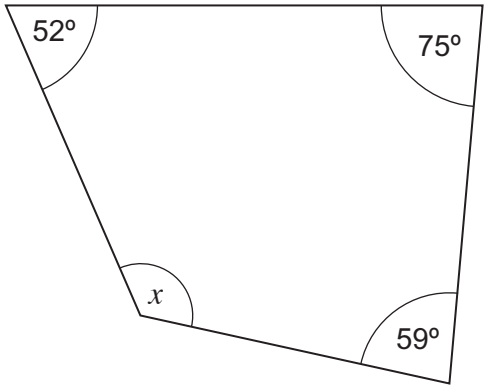
Not drawn accurately

Using a ruler and compasses, make an accurate construction of the kite.
AC has been drawn for you.

[3 marks]

6

14 (a)



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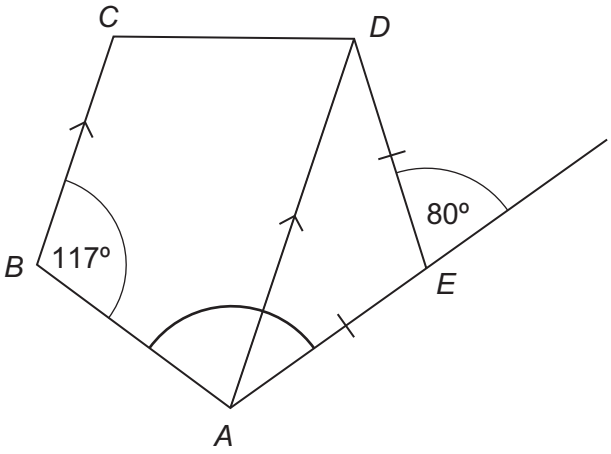
Work out the value of x.

[2 marks]

Answer _____ degrees

14 (b) *AD* is parallel to *BC*.

AE = *DE*



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Work out the size of angle *BAE*.

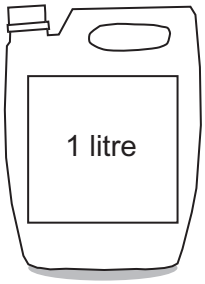
[3 marks]

Answer _____ degrees

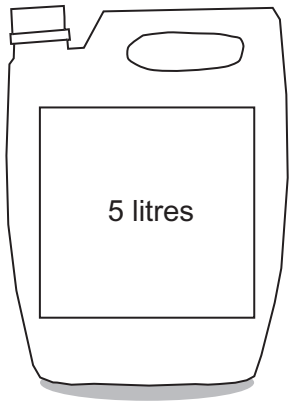
Turn over for the next question

5

***15** Oil is sold in two sizes.



£8.75



was £49.80

now 15% off

Which size is better value for money?
You **must** show your working.

[4 marks]

Answer _____

16 Jack drives 95 miles.

He drives at an average speed of 38 mph
He starts his journey at 7 am

What time does he arrive?

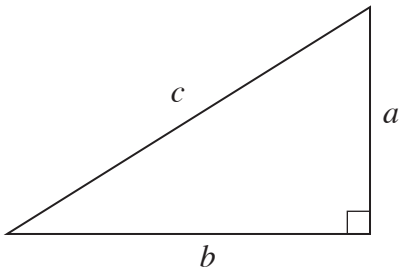
[3 marks]

Answer _____

Turn over for the next question

7

17 (a) The diagram shows a right-angled triangle.

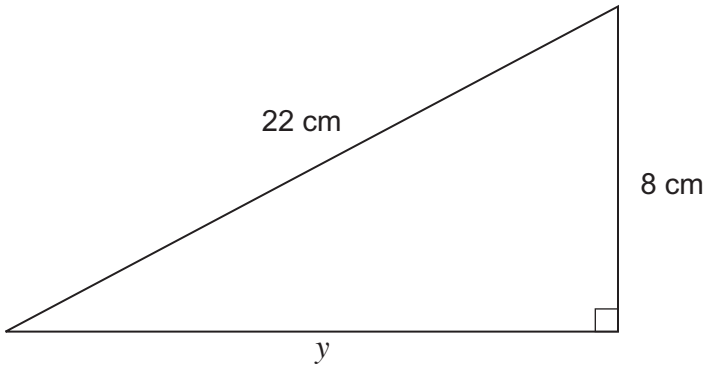


Circle the **two** correct formulae.

[2 marks]

$c = ab$ $\quad c = a + b$ $\quad c^2 = a^2 + b^2$ $\quad c = \frac{1}{2}ab$ $\quad c = \sqrt{a^2 + b^2}$

17 (b) Work out the length y.



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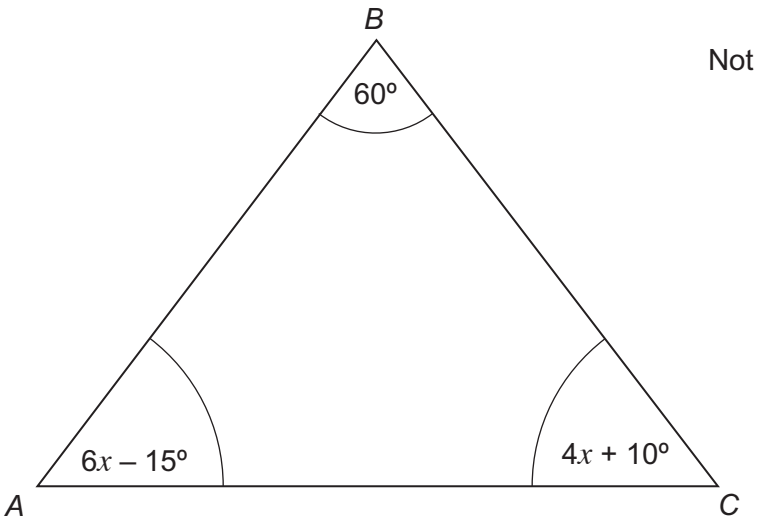
Give your answer to 1 decimal place.

[4 marks]

Answer _____ cm

***18** Show that *ABC* is an equilateral triangle.



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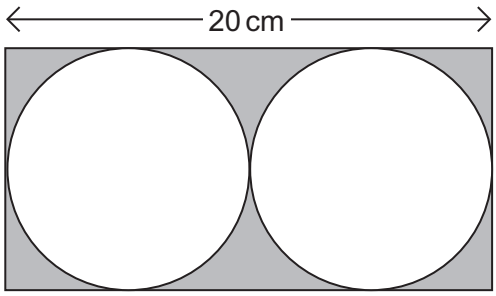
[5 marks]

11

Turn over ▶

19 Two identical circles fit inside a rectangle as shown.



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The length of the rectangle is 20 cm

Work out the area of the shaded section.

[6 marks]

Answer _____ cm^2

END OF QUESTIONS

6

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