![AQA logo]

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 = $\frac{1}{2}(a+b)h$
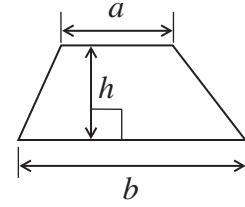
Volume of prism = area of cross-section × length
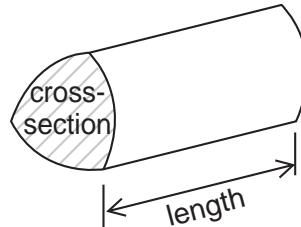
Answer **all** questions in the spaces provided.

1 Triangle *ABC* is shown on this centimetre grid.
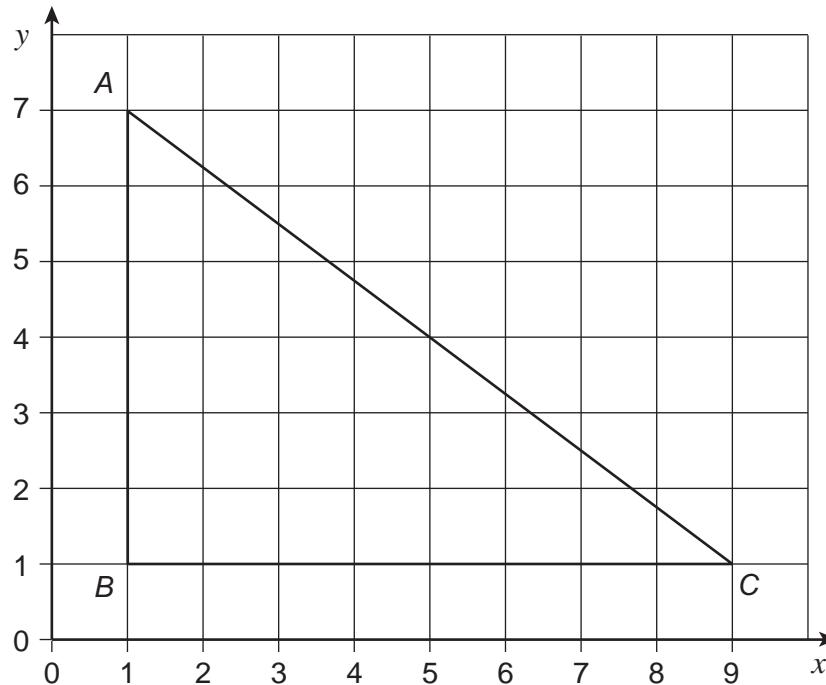
1 (a) Measure the length of the side *AC*.
Give your answer in centimetres.

[1 mark]

Answer _____ cm

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

[2 marks]

_____

_____

Answer _____ cm

Turn over ▶

2 Here are five shapes.
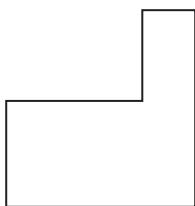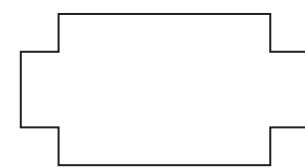
A B C
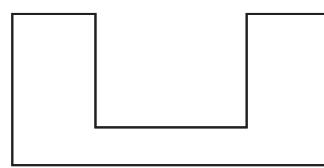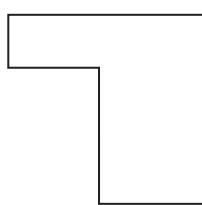
D E
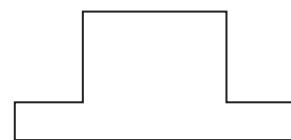
2 (a) Which shape has the most vertices?
Circle your answer.

[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

0 4

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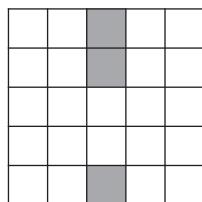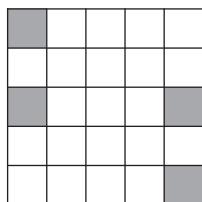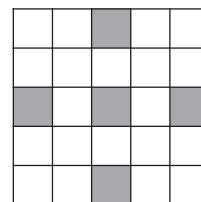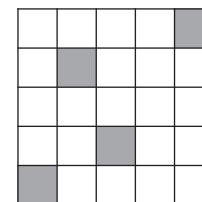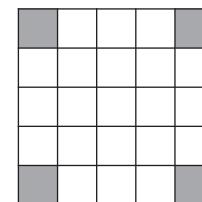
        A   *B*   *C*   *D*   *E*

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

Turn over ▶

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

Turn over ▶

5 The diagram shows some flour on weighing scales.
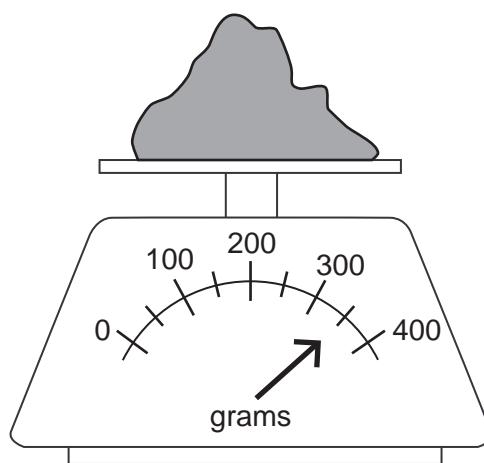
5 (a) How much does the flour weigh?

[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?
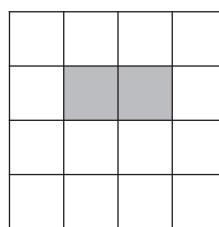
Circle the **two** correct answers.

[2 marks]

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

6 (b) The diagram shows a square grid.
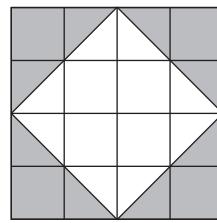
What percentage of this grid is shaded?

[2 marks]

_____

_____

Answer _____ %

7

Turn over ▶

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

5 litres

10 litres

£26.00

£45.50
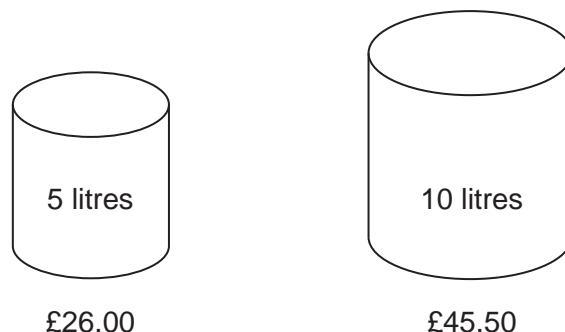
7 (a) A decorator buys four 10-litre tins.

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

[3 marks]

_____

_____

_____

_____

_____

_____

Answer _____

Do not write
outside the
box

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

Turn over ▶

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

Not drawn accurately

D (4, 9)

A

C (7, 1)

O

x

y

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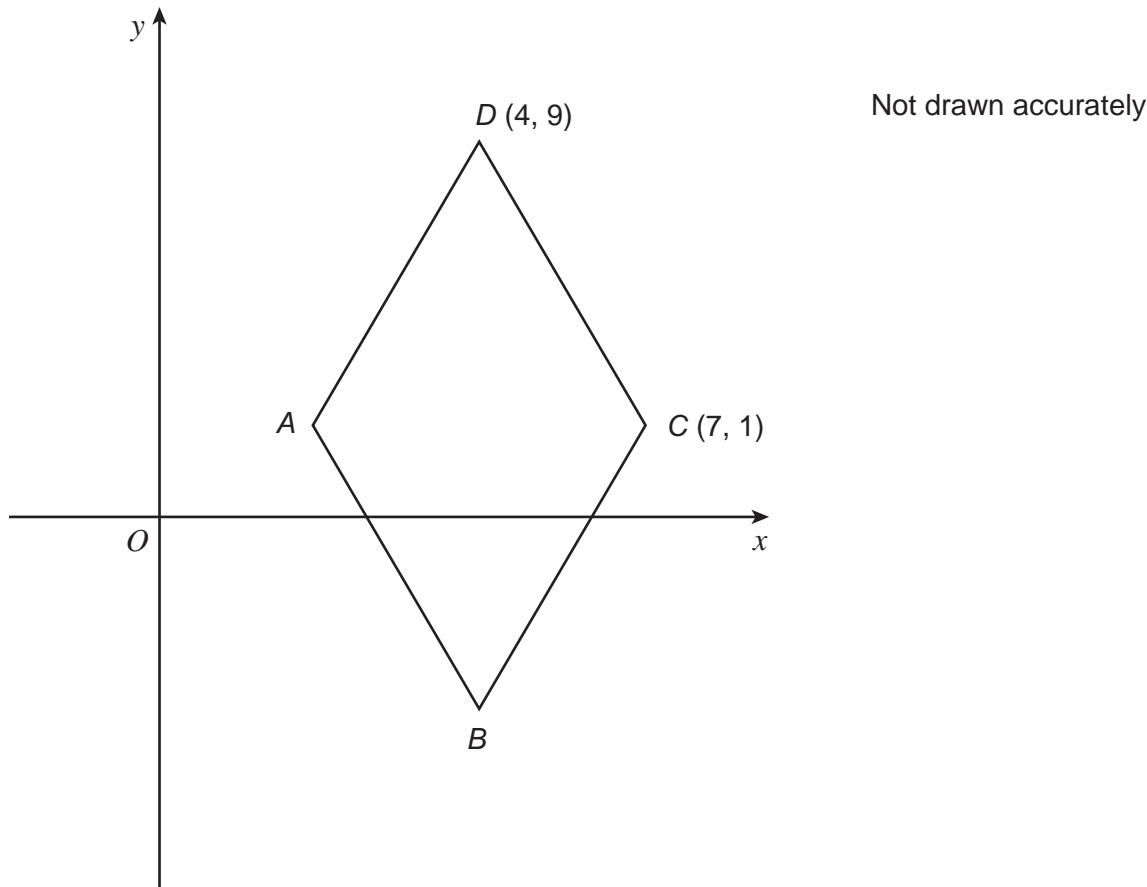
8 (a)   Work out the coordinates of *A*.

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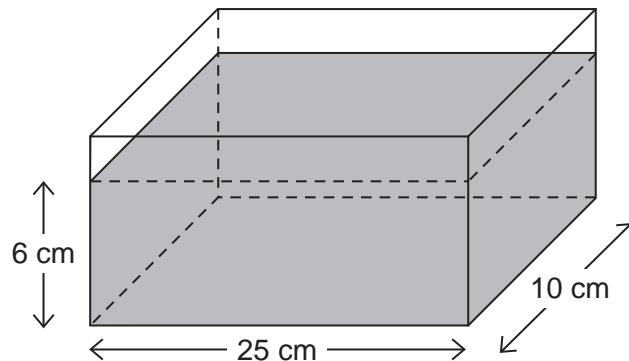
The height of the water in the tank is 6 cm
Water leaks from the bottom of the tank at the rate of 30 cm^3 per minute.

How many minutes will it take the tank to empty?

[3 marks]

_____

_____

_____

_____

_____

_____

_____

Answer _____ minutes

10   10 square metres = 12 square yards

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

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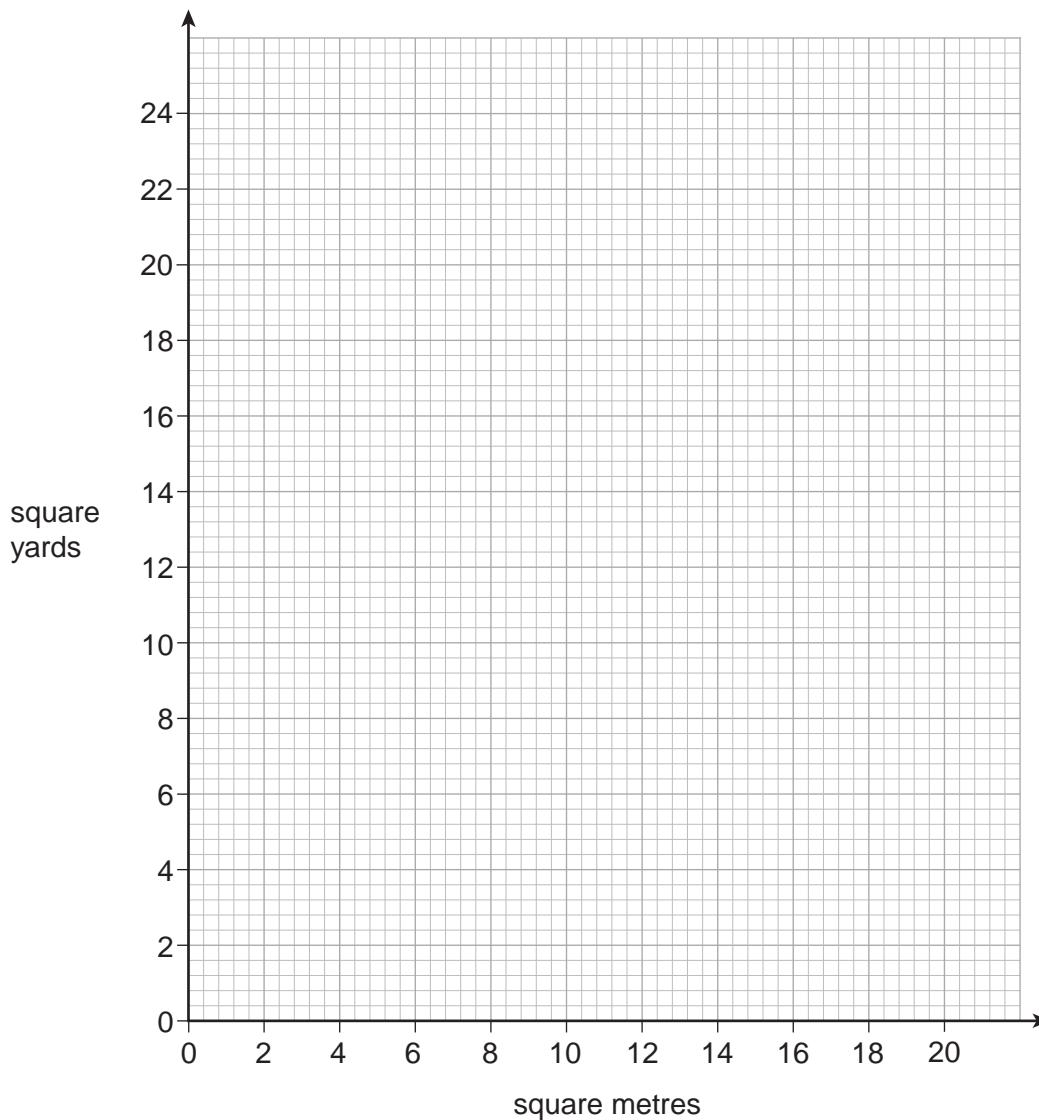
10 (b)   How many square metres are equal to 18 square yards?
Circle your answer.

[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

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

[2 marks]
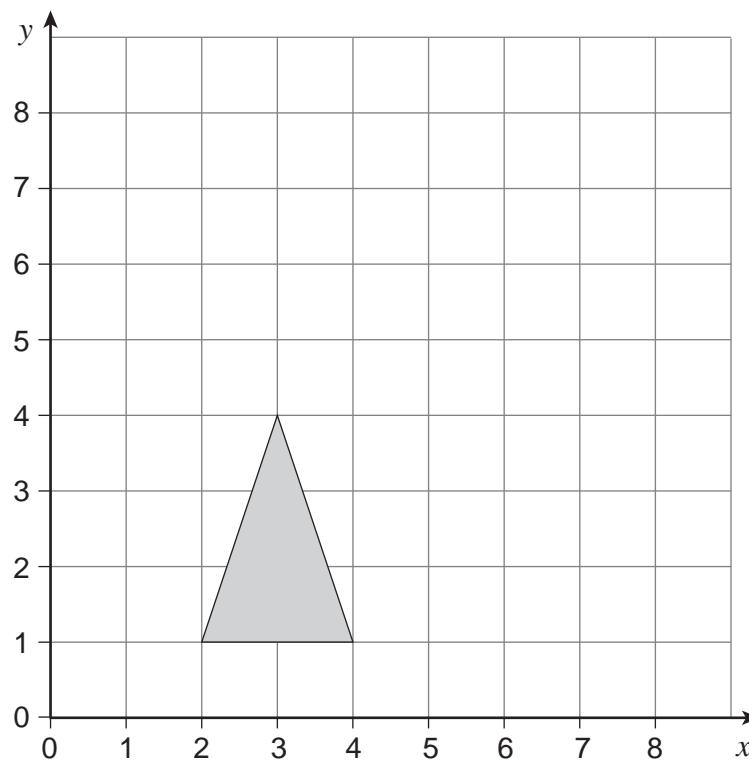
11 (b)   Enlarge this shape by scale factor 3

[2 marks]
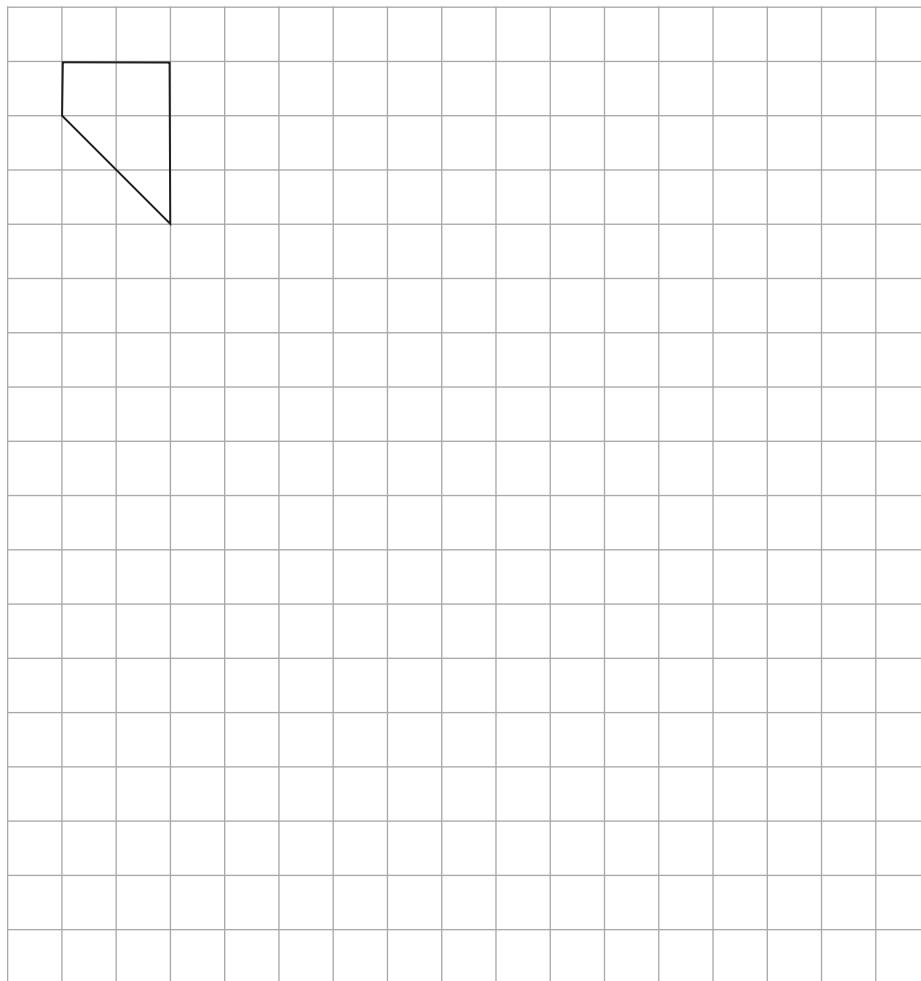
Turn over for the next question

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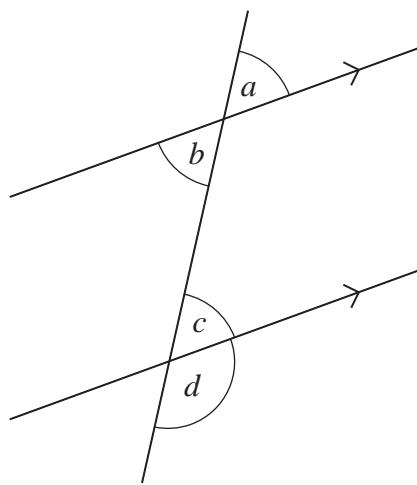
12 (a)   Which angles are vertically opposite?
Circle your answer.

[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.

B

4 cm

A ⎯⎯⎯⎯⎯ C
6 cm

Not drawn accurately

8 cm

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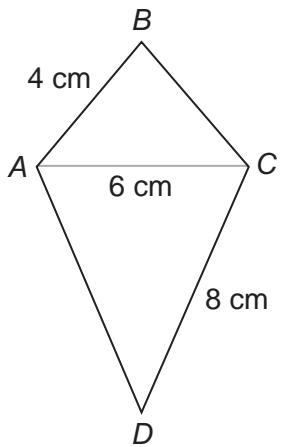
Using a ruler and compasses, make an accurate construction of the kite.
AC has been drawn for you.

[3 marks]

A ●⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯● C

Turn over ▶

6

14 (a)

52⁰

75⁰

Not drawn accurately

x

59⁰

Work out the value of x.

[2 marks]

_____

_____

_____

Answer _____ degrees

14 (b)   *AD* is parallel to *BC*.
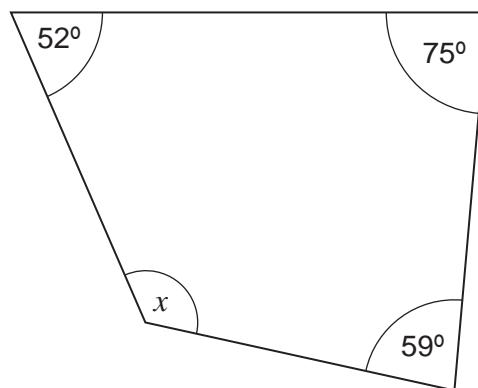
AE = DE

Not drawn accurately
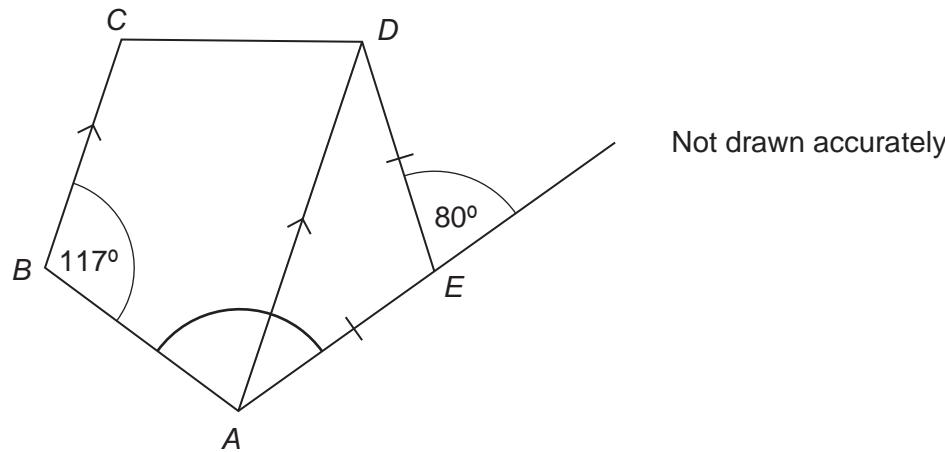
Work out the size of angle *BAE*.

[3 marks]

_____

_____

_____

Answer _____ degrees

Turn over for the next question

*15 Oil is sold in two sizes.

1 litre

5 litres
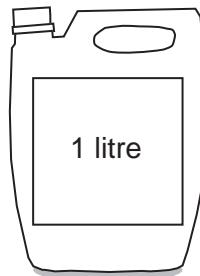
£8.75
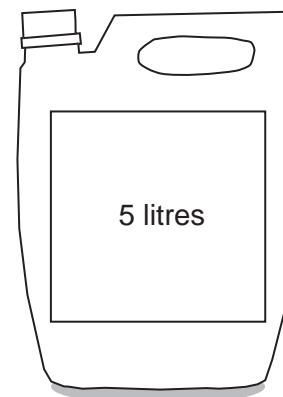
was £49.80

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

17 (a) The diagram shows a right-angled triangle.
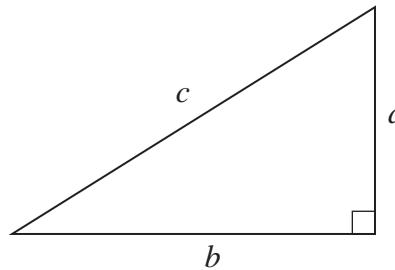
Circle the **two** correct formulae.

[2 marks]

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

**17 (b)** Work out the length y.

Not drawn accurately
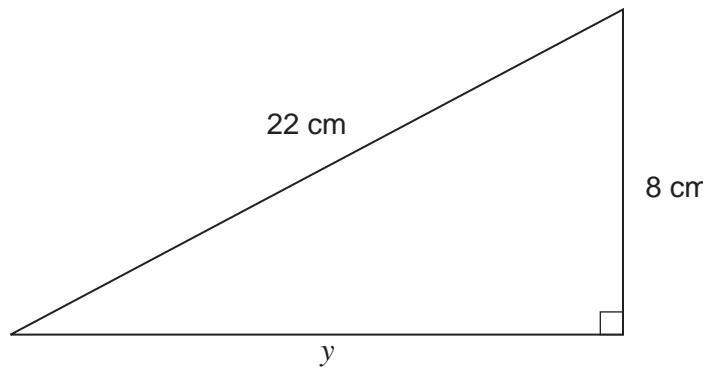
Give your answer to 1 decimal place.

[4 marks]

_____

_____

_____

_____

Answer _____ cm

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

B

Not drawn accurately

60º

6x − 15º

4x + 10º

A

C
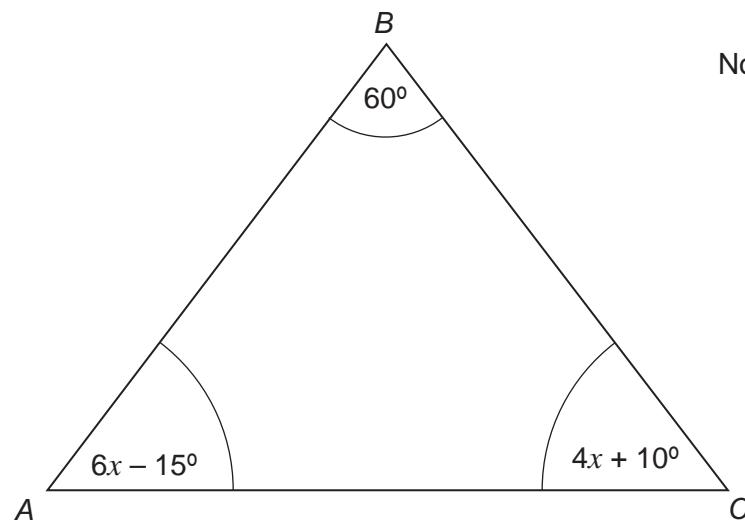
[5 marks]

_____

_____

_____

_____

_____

_____

_____

_____

11

Turn over ▶

19 Two identical circles fit inside a rectangle as shown.
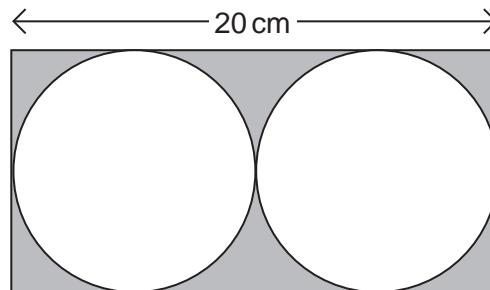
←——— 20 cm ———→

Not drawn
accurately

The length of the rectangle is 20 cm

Work out the area of the shaded section.

[6 marks]

_____

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____ cm^2

END OF QUESTIONS

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