

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

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Forename(s)

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Candidate signature

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# GCSE MATHEMATICS

# F

Foundation Tier Unit 3 Geometry and Algebra

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Tuesday 10 November 2015

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. Cross through any work that you do not want to be marked.
- If your calculator does not have a  $\pi$  button, take the value of  $\pi$  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 11, 12, 17 and 20. 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 booklet.

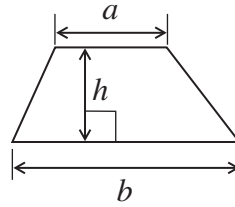
## Advice

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

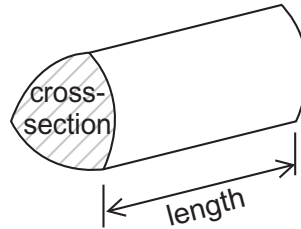


**Formulae Sheet: Foundation Tier**

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



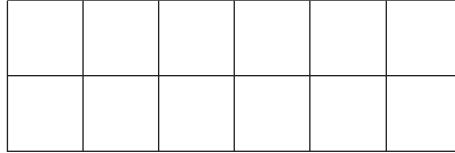
**Volume of prism** = area of cross section  $\times$  length



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

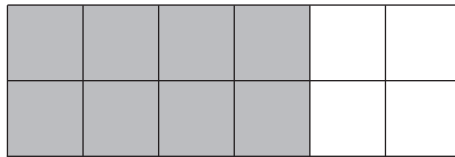
**1 (a)** Shade 25% of this centimetre grid.

**[1 mark]**



**1 (b)** Work out the fraction of this centimetre grid that is shaded.  
Give your answer in its simplest form.

**[2 marks]**



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Answer .....



2 Here are some units.

- |            |             |        |             |
|------------|-------------|--------|-------------|
| metres     | kilograms   | litres | millilitres |
| kilometres | centimetres | grams  | tonnes      |

Choose the best unit to complete each sentence.

**[3 marks]**

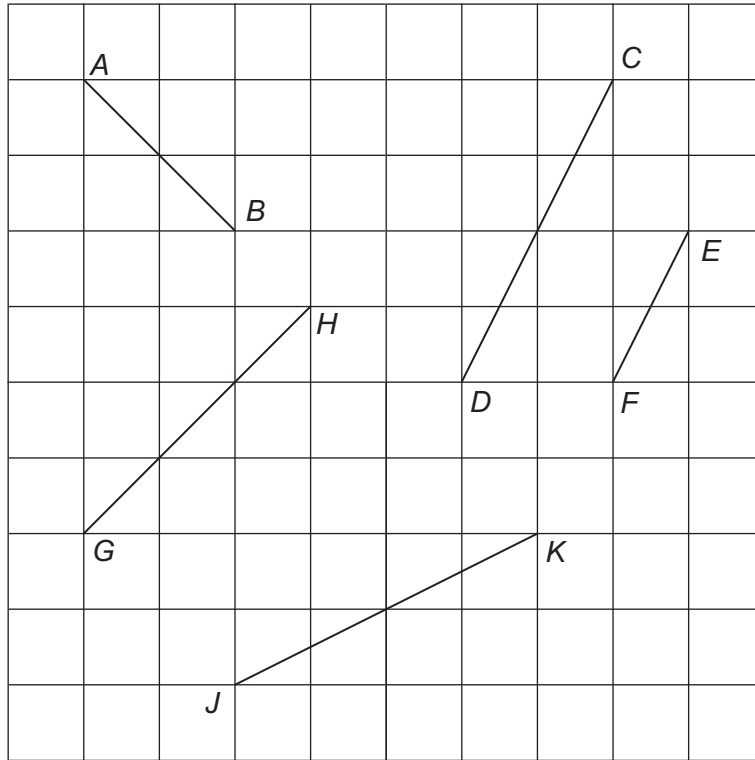
The length of a classroom is measured in .....

The mass of an average human is measured in .....

The amount of water in a full bath is measured in .....



3 The diagram shows five lines on a square grid.



3 (a) Which **two** lines are parallel?  
Circle your answers.

[1 mark]

*AB*            *CD*            *EF*            *GH*            *JK*

3 (b) Which **two** lines are perpendicular?  
Circle your answers.

[1 mark]

*AB*            *CD*            *EF*            *GH*            *JK*

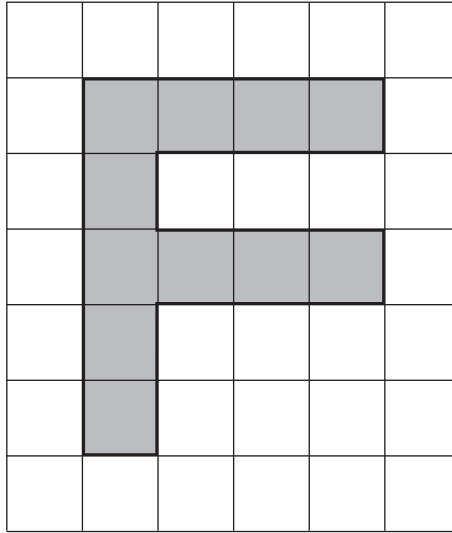
3 (c) Which **two** lines are the same length?  
Circle your answers.

[1 mark]

*AB*            *CD*            *EF*            *GH*            *JK*



4 (a)



Work out the shaded area on this centimetre grid.  
State the units of your answer.

**[2 marks]**

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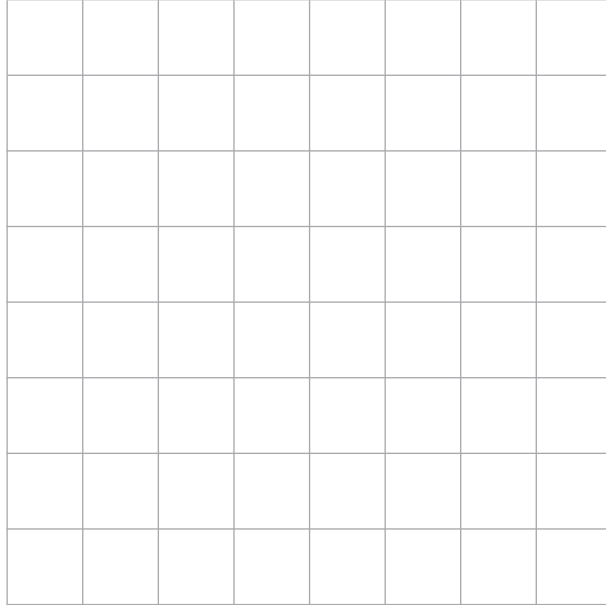
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Answer .....



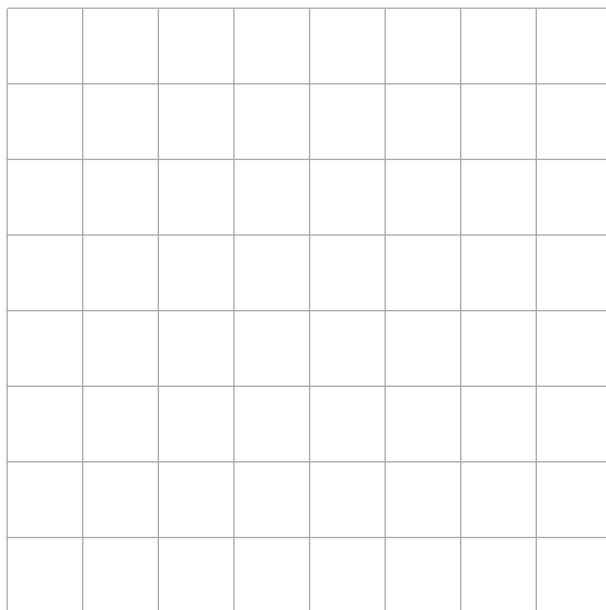
- 4 (b)** Draw a rectangle on this centimetre grid with  
perimeter 18 cm

[1 mark]

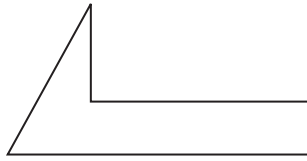


- 4 (c)** Draw a rectangle on this centimetre grid with  
perimeter 16 cm and area 12 cm<sup>2</sup>

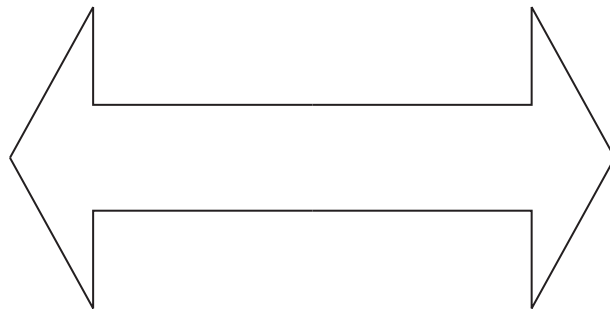
[2 marks]



- 5 The diagram shows a half-arrow.



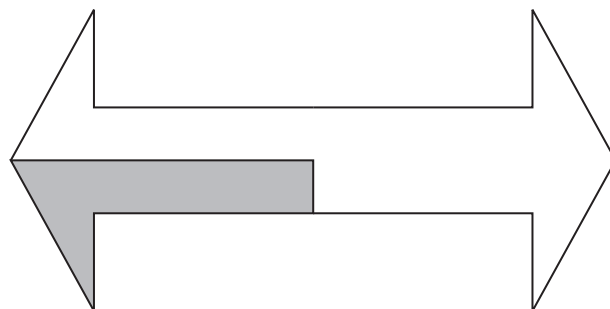
- 5 (a) Four half-arrows are joined to make this shape.



Draw **all** the lines of symmetry on the shape.

[2 marks]

- 5 (b) One of the four half-arrows is shaded in this diagram.



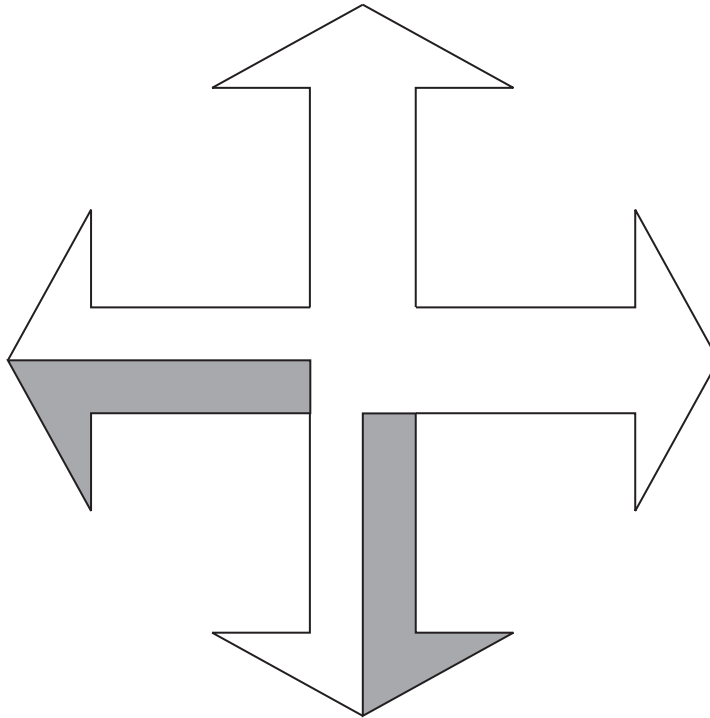
Shade **one more** half-arrow so that the diagram has one line of symmetry.

[1 mark]





5 (c) Two half-arrows are shaded in this diagram.



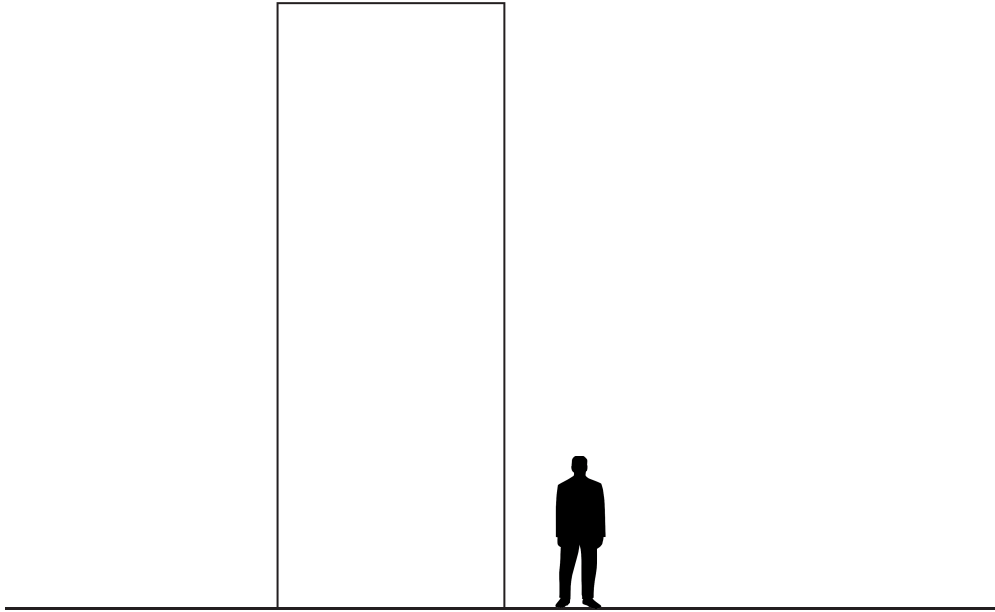
Shade **two more** half-arrows so that the diagram has rotational symmetry of order 4

[1 mark]

Turn over for the next question



6 Here is a diagram of a man standing by a building.



The actual height of the man is 1.7 m

Work out an estimate for the height of the building.

**[3 marks]**

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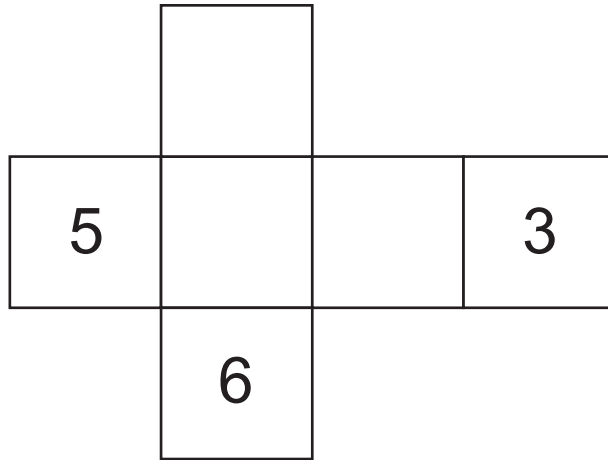
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Answer ..... m



7 The diagram shows the net of a cube.



Put numbers on the blank faces so that opposite faces of the cube add up to 7 [2 marks]

8 5 miles = 8 kilometres  
Which is longer, 26 miles or 45 km?  
You **must** show your working.

[2 marks]

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Answer .....

7
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Turn over ►



**9** An adult ticket costs £65.50  
A child ticket costs £35.25

**9 (a)** Kate has £105  
She buys one adult ticket and one child ticket.

How much money does she have left?

**[2 marks]**

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.....  
.....

Answer £ .....

**9 (b)** Gina buys 5 tickets.  
She pays exactly £267

How many of each type of ticket does she buy?

**[2 marks]**

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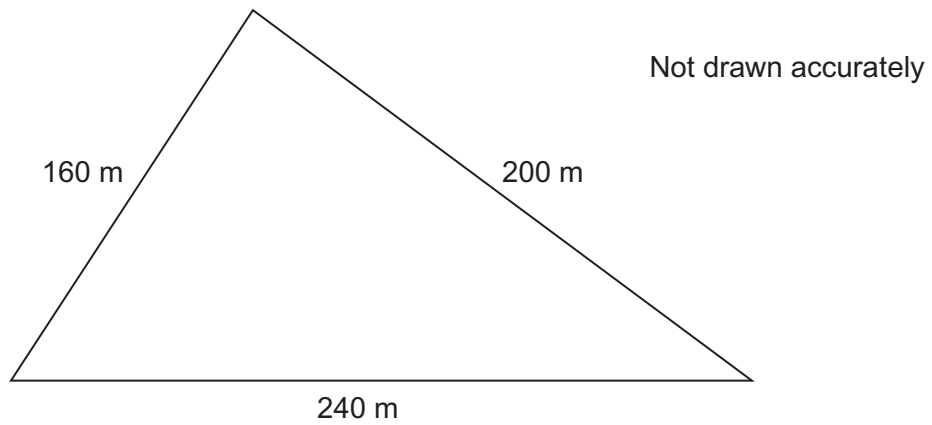
Adult .....

Child .....



10

Construct an accurate scale drawing of this triangle.



Use the scale 1 cm represents 20 m

The base has been drawn for you.

**[3 marks]**

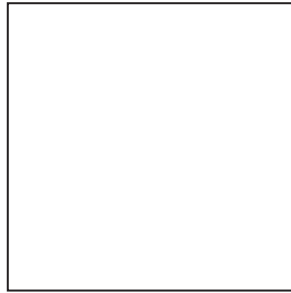
Scale: 1 cm represents 20 m

7

Turn over ►



11 (a) The diagram shows a square.



Not drawn accurately

$(4x + 3)$  cm

Work out the perimeter of the square when  $x = 4.5$

**[3 marks]**

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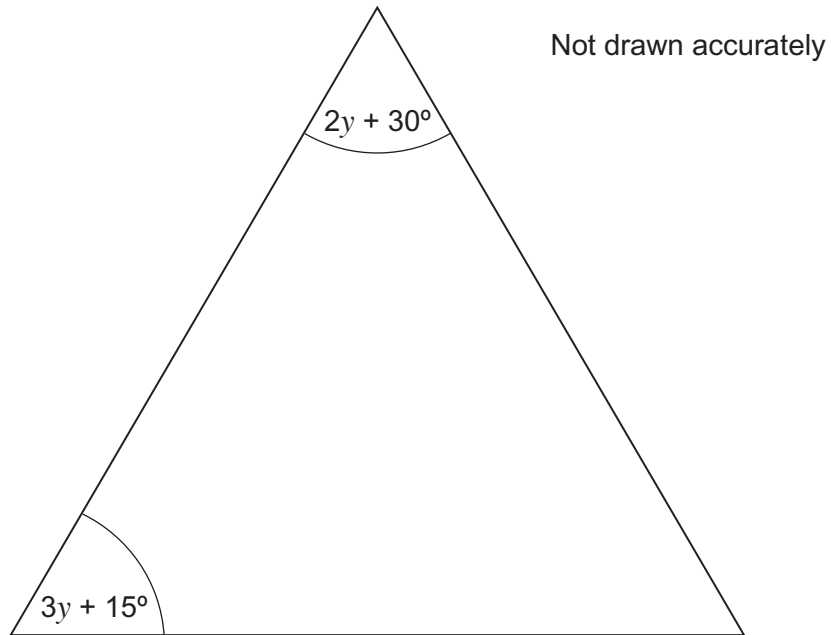
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Answer ..... cm



**\*11 (b)** The diagram shows a triangle.



Show that the triangle is equilateral when  $y = 15^\circ$

**[3 marks]**

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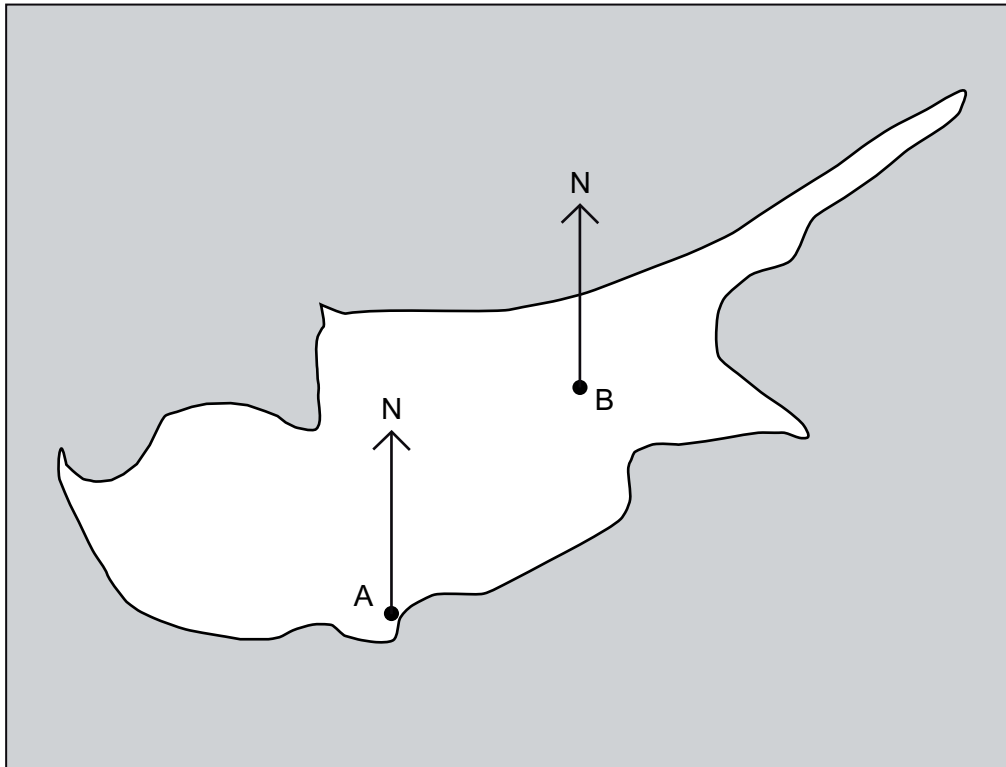
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**\*12**

Here is a map.



Measure and write down the three-figure bearing of B from A.

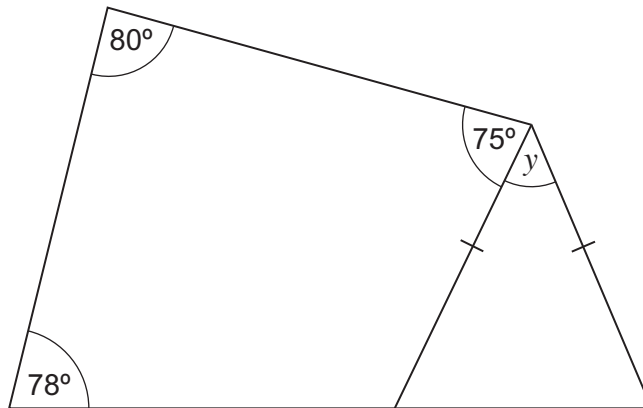
**[2 marks]**

Answer .....°





13 An isosceles triangle and a quadrilateral are joined to make this shape.



Not drawn  
accurately

The base of the shape is a straight line.

Work out the size of angle  $y$ .

[4 marks]

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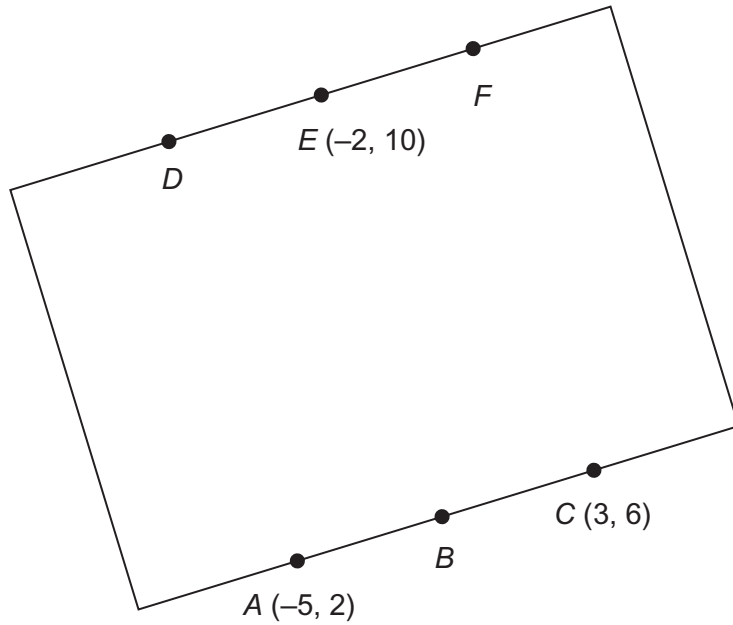
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Answer ..... degrees



- 14** The diagram shows a rectangle with dots on two sides.  
The coordinates of  $A$ ,  $C$  and  $E$  are shown in the diagram.  
 $AC = DF$



Not drawn  
accurately

The dots on each side are equally spaced.  
Work out the coordinates of  $B$ ,  $D$  and  $F$ .

**[4 marks]**

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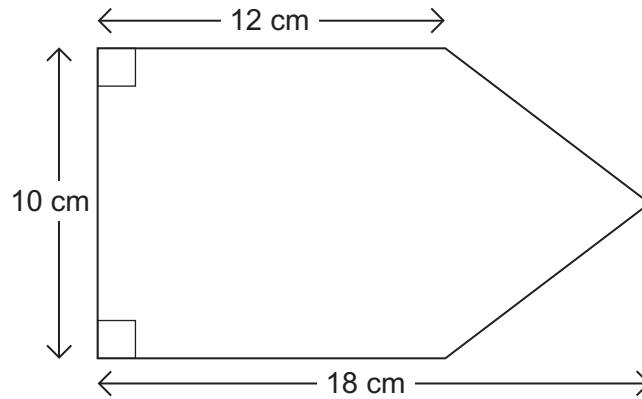
$B$  ( ..... , ..... )

$D$  ( ..... , ..... )

$F$  ( ..... , ..... )



15 Work out the area of this pentagon.



Not drawn accurately

[3 marks]

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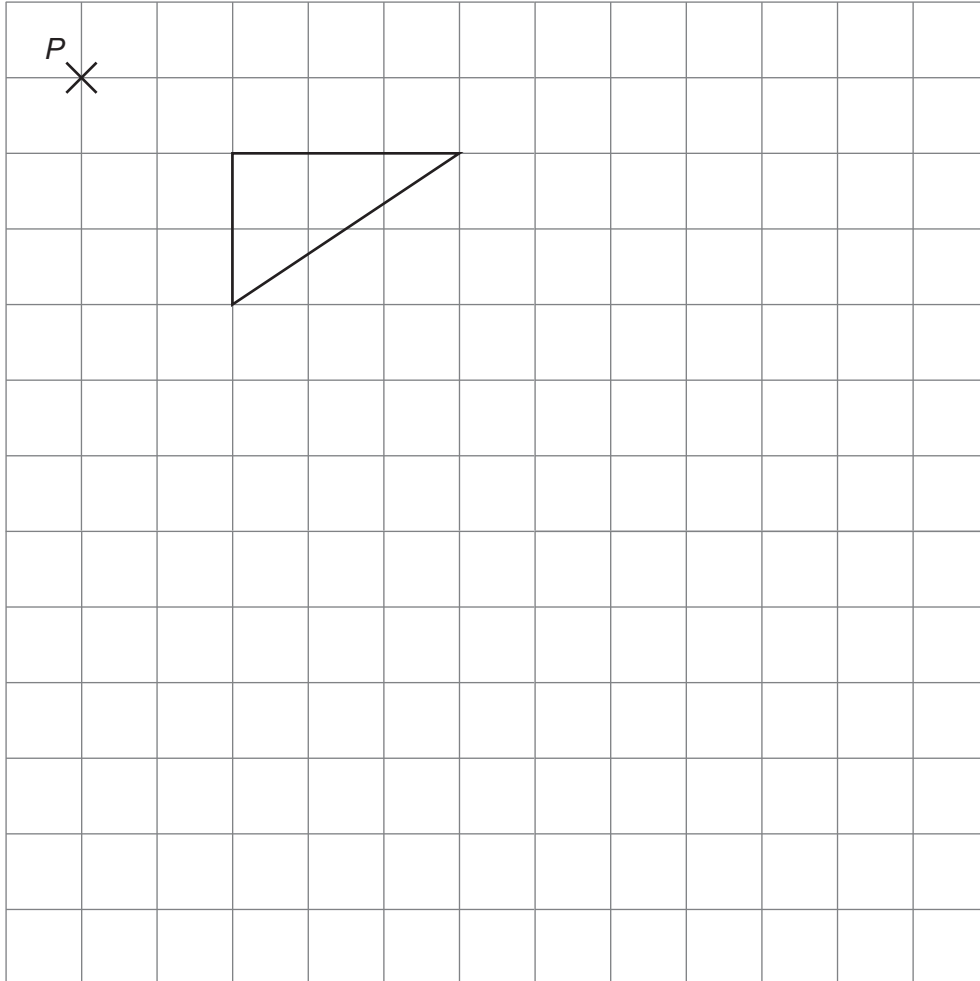
Answer ..... cm<sup>2</sup>

Turn over for the next question



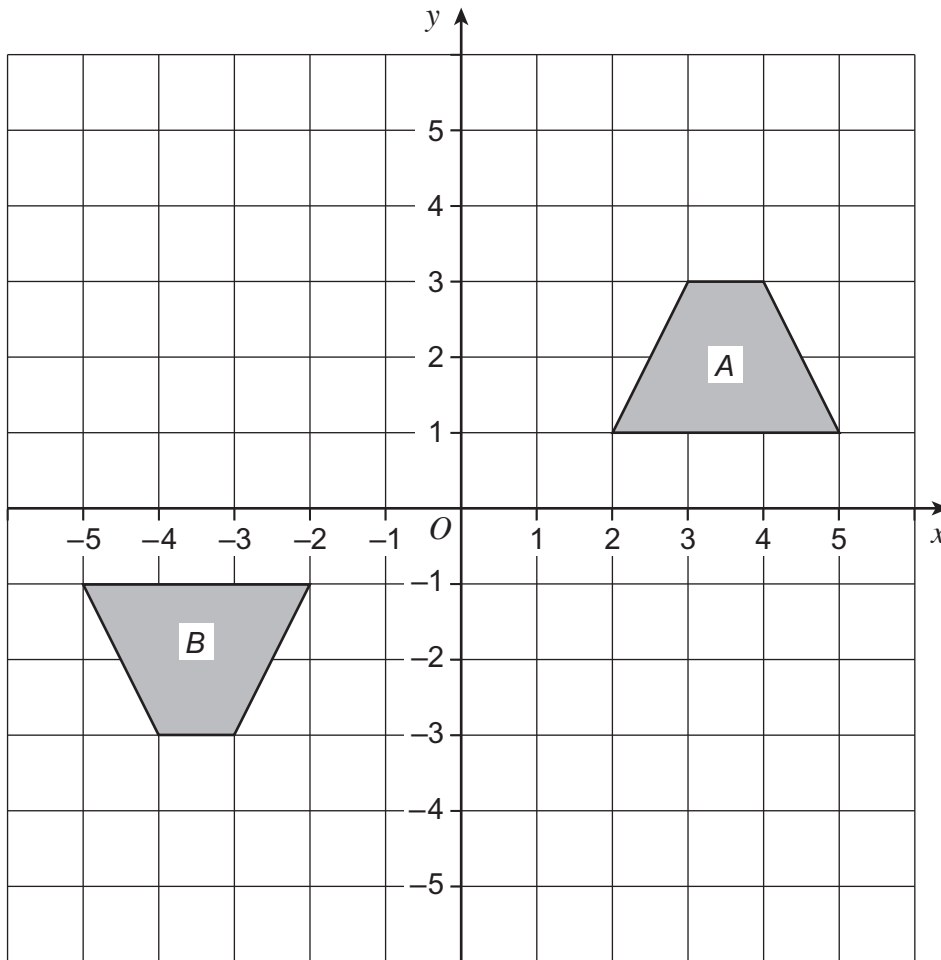
16 (a) Enlarge this shape by scale factor 2 with centre of enlargement point  $P$ .

[3 marks]



16 (b) Describe fully the **single** transformation that maps shape A to shape B.

[3 marks]



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**\*17** A gardener uses this formula to work out how much he charges to make a lawn.

$$C = \frac{7(14 + A)}{3}$$

$C$  is the charge in £

$A$  is the area in  $\text{m}^2$

He makes a rectangular lawn measuring 12.5 m by 17.6 m

How much does he charge?

**[3 marks]**

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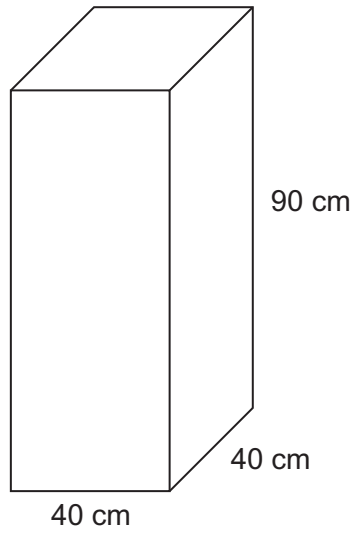
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Answer £ .....



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



The tank is full of water.

1 litre = 1000 cm<sup>3</sup>

How many gallons of water are in the tank?

[4 marks]

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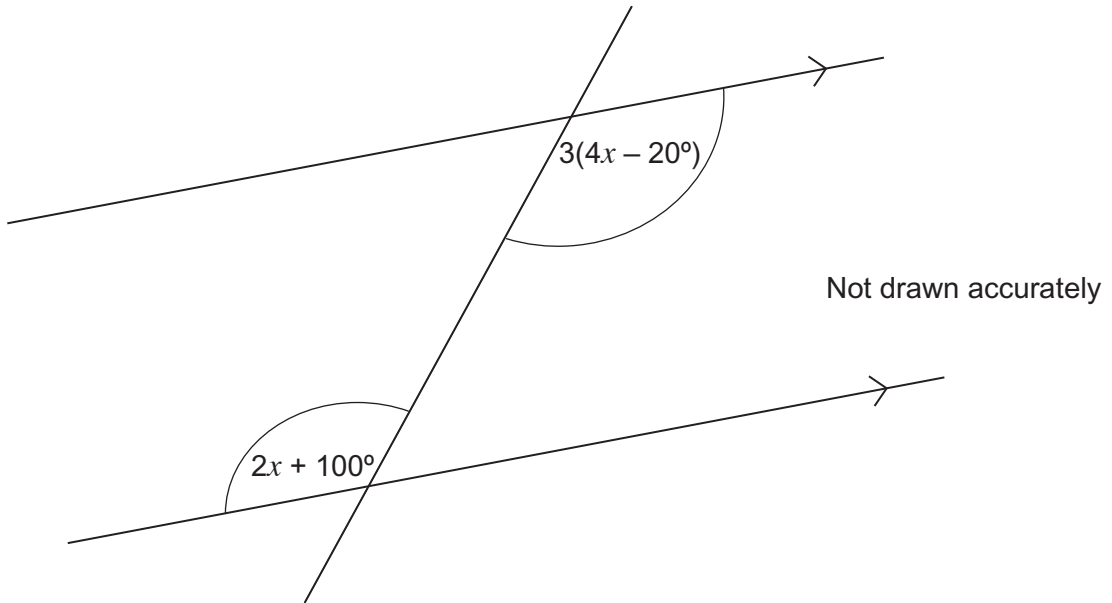
Answer ..... gallons

7

Turn over ►



- 19 The diagram shows three straight lines.



- 19 (a) Which of the following describes the pair of angles marked?  
Circle your answer.

[1 mark]

Alternate

Corresponding

Interior

Vertically opposite





**19 (b)** Work out the value of  $x$ .

**[4 marks]**

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$x =$  ..... degrees

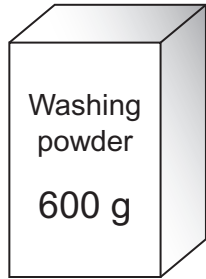
**Turn over for the next question**

5

**Turn over** ►



**\*20** Washing powder is sold in two sizes, 600 grams and 1500 grams.



£3.30



Was £9.60  
Now 15% off

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

**[6 marks]**

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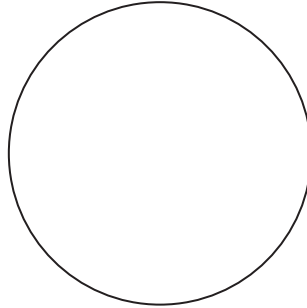
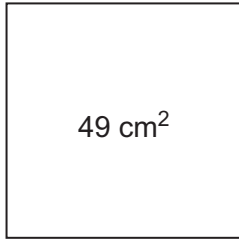
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Answer .....



21 The diagram shows a square and a circle.

Not drawn accurately



The **area** of the square is  $49 \text{ cm}^2$

The **perimeter** of the square is equal to the **circumference** of the circle.

Work out the radius of the circle.  
Give your answer to 1 decimal place.

**[5 marks]**

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Answer ..... cm

**END OF QUESTIONS**



**There are no questions printed on this page**

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