



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE MATHEMATICS

F

Foundation Tier Unit 3 Geometry and Algebra

Tuesday 8 November 2016

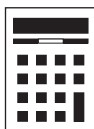
Morning

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. Cross through any work that you do not want to be marked.
- 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 3, 16 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.



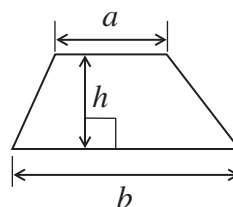
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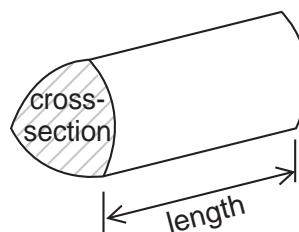
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Formulae Sheet: Foundation Tier

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

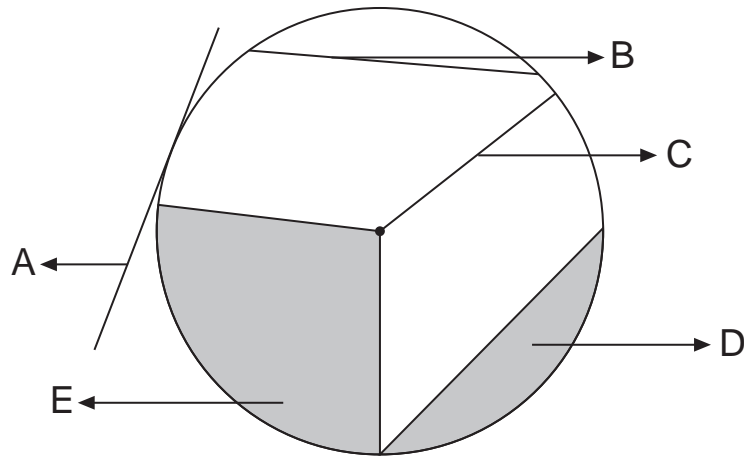


Volume of prism = area of cross section \times length



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

1 Parts of a circle are shown.



Circle the correct letter for each part.

1 (a) Radius

[1 mark]

A B C D E

1 (b) Sector

[1 mark]

A B C D E

1 (c) Tangent

[1 mark]

A B C D E



2 (a) Which **one** of these shapes always has four equal sides?
Circle your answer.

[1 mark]

Kite Parallelogram Rectangle Rhombus Trapezium

2 (b) Which **one** of these shapes has exactly one pair of parallel sides?
Circle your answer.

[1 mark]

Kite Parallelogram Rectangle Rhombus Trapezium

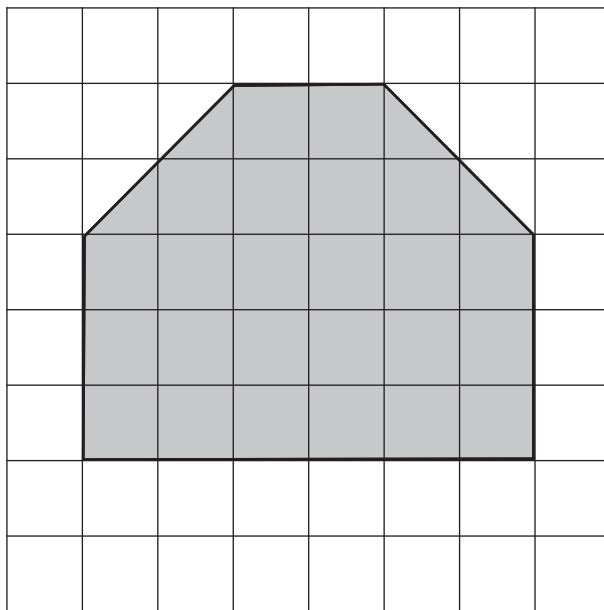
2 (c) Which **two** of these shapes always have diagonals intersecting at right angles?
Circle your answers.

[2 marks]

Kite Parallelogram Rectangle Rhombus Trapezium



*3 A sketch of a patio is shaded on this grid.



Each square represents 1 metre by 1 metre.

Beth uses this formula to work out the cost of building the patio.

$$\text{Cost (£)} = \text{area of patio in square metres} \times 13.60$$

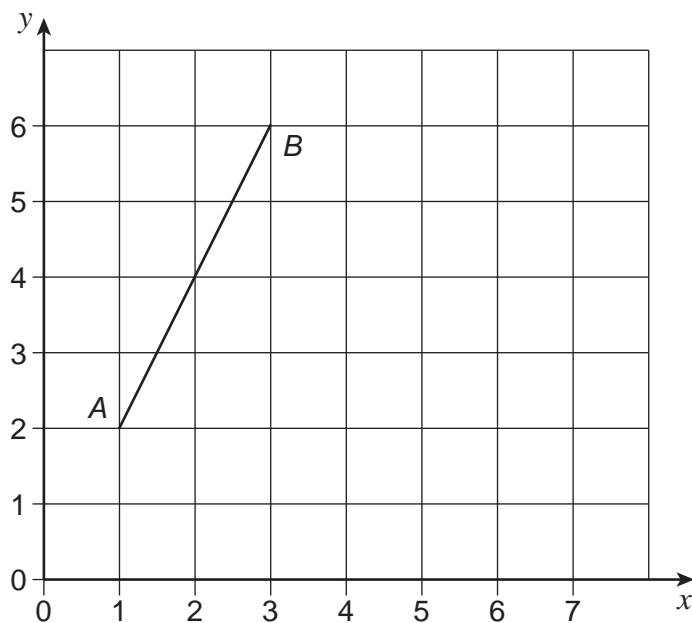
Work out the cost of building the patio.

[3 marks]

Answer £ _____



4 Here is a centimetre grid.



4 (a) Measure and write down the length of AB .

[1 mark]

Answer _____ cm

4 (b) Write down the coordinates of the midpoint of AB .

[1 mark]

Answer (_____ , _____)



4 (c) C is a point on the grid.

ABC is an isosceles triangle.

$$AB = AC$$

Circle the coordinates of the **two** possible positions of C .

[2 marks]

(4, 0) (5, 0) (6, 0) (5, 3) (5, 4) (5, 5)

4 (d) D is a point on the grid.

ABD is an isosceles triangle.

$$AB = BD$$

Circle the coordinates of the **two** possible positions of D .

[2 marks]

(4, 2) (5, 2) (6, 2) (7, 3) (7, 4) (7, 5)

Turn over for the next question



5 (a) Convert 0.17 kilometres to metres.

[1 mark]

Answer _____ metres

5 (b) Convert 1800 millimetres to metres.

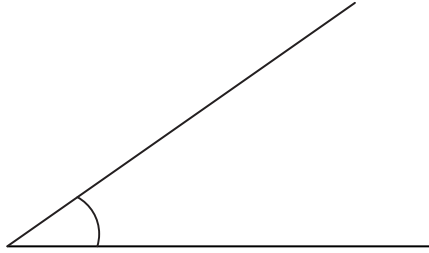
[1 mark]

Answer _____ metres



6 (a) Measure the size of the marked angle.

[1 mark]



Answer _____ degrees

6 (b) What type of angle is 290° ?
Circle your answer.

[1 mark]

Acute

Right-angle

Obtuse

Reflex

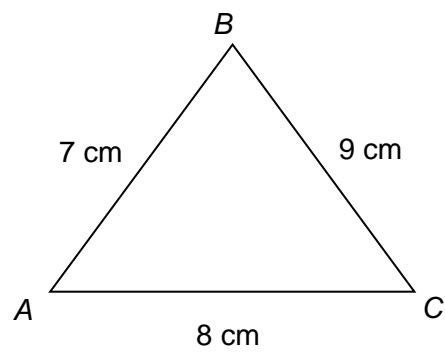
Turn over for the next question



7

Using a ruler and compasses, make an accurate drawing of this triangle.
AC has been drawn for you.

[2 marks]



Not drawn accurately



8 A box of 4 bottles of water costs £1.12
A box of 6 bottles of water costs £1.75

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

[2 marks]

Answer _____

Turn over for the next question

4

Turn over ►



9 Here are six sticks.

 25 cm

Not drawn accurately

 50 cm

 75 cm

 1 m

 1.5 m

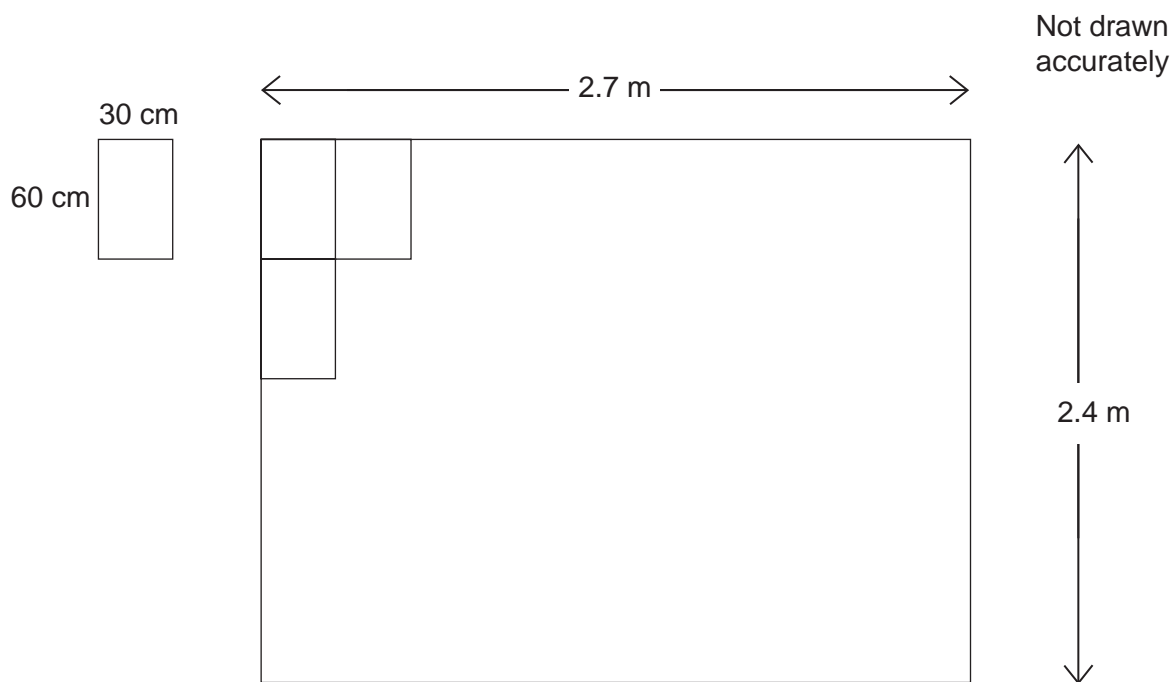
 2 m

Show how **all** six sticks can fit together to make a rectangle.

[2 marks]



10 A rectangular tile and a rectangular wall are shown.



How many tiles are needed to cover the wall?

[3 marks]

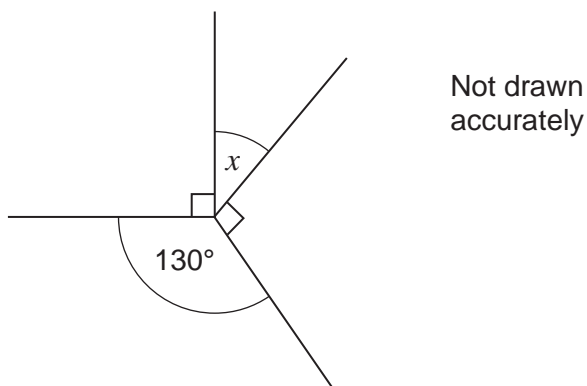
Answer _____

5

Turn over ►



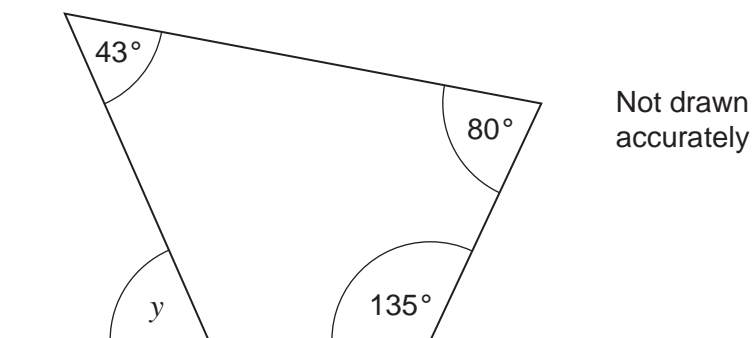
11 (a) Work out the size of angle x .



[2 marks]

Answer _____ degrees

11 (b) The base line of this quadrilateral is extended.



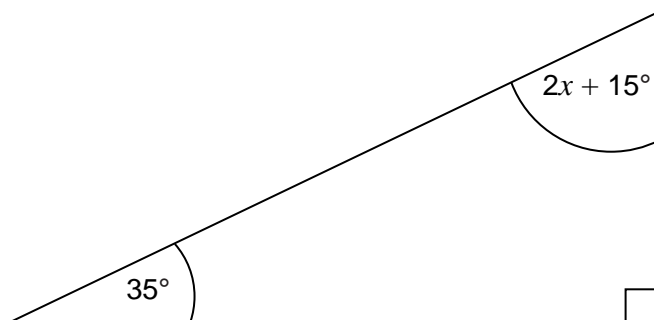
Work out the size of angle y .

[3 marks]

Answer _____ degrees



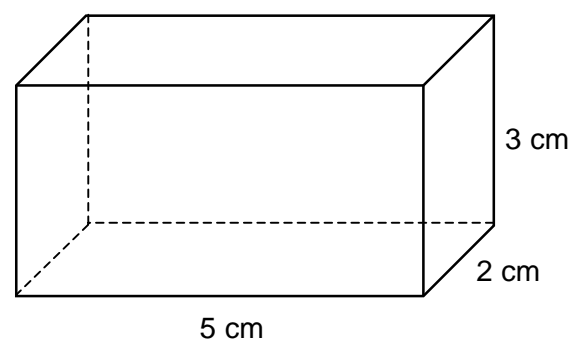
12

Not drawn
accuratelyWork out the value of x .**[3 marks]**

Answer _____ degrees

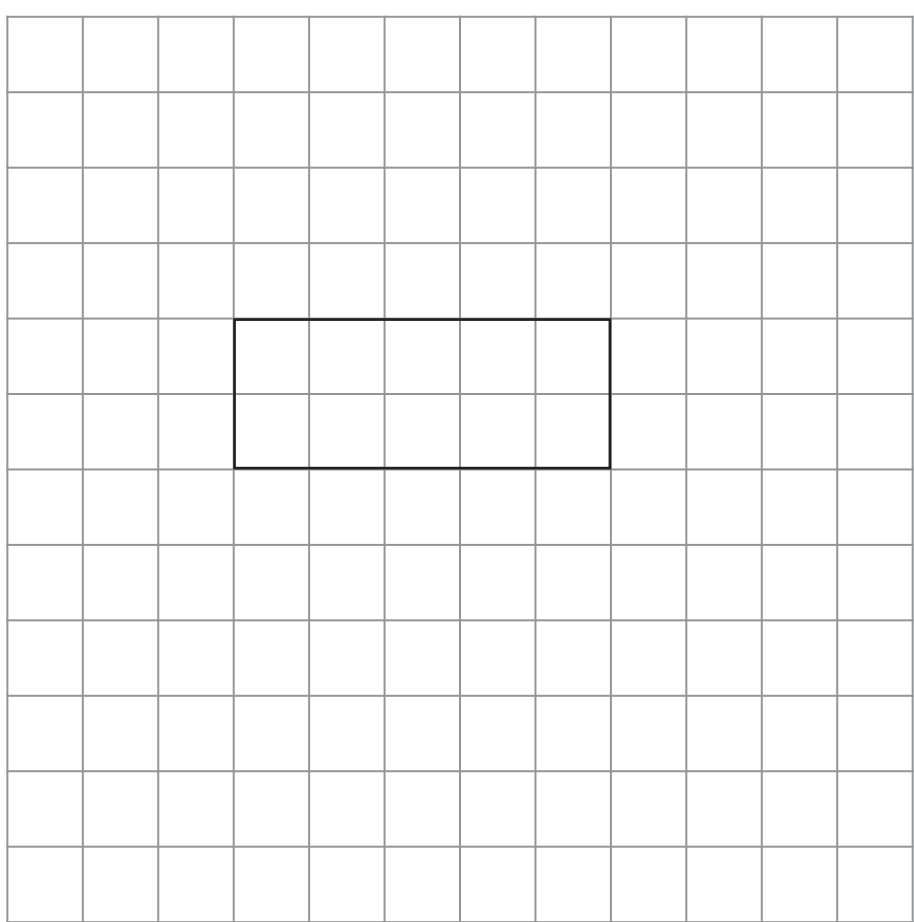
Turn over for the next question

13 (a) The diagram shows a cuboid.



Draw an accurate net of the cuboid on this centimetre grid.
One face has been done for you.

[2 marks]



13 (b) Each edge of the cuboid is enlarged by scale factor 4

Write down the dimensions of the enlarged cuboid.

[1 mark]

Answer _____ cm, _____ cm, _____ cm

13 (c) Work out the volume of the enlarged cuboid.

[1 mark]

Answer _____ cm^3

Turn over for the next question

4

Turn over ►



14 John goes on this walk.

From	To	Direction (bearing)	Distance
A	B	East	1 mile
B	C	160°	2 miles
C	D	South-west	1 mile
D	A		

14 (a) Make an accurate scale drawing of the walk.
Use a scale of 2 cm to represent 1 mile.

[4 marks]



Scale 2 cm represents 1 mile



- 14 (b)** Work out the distance from D to A.
Give your answer to the nearest mile.

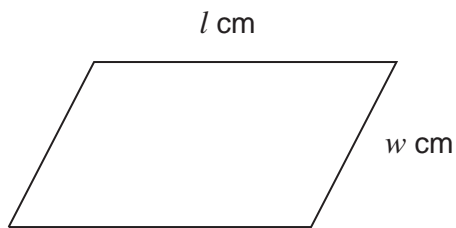
[1 mark]

Answer _____ miles

Turn over for the next question



15 (a)



The perimeter of the parallelogram is $P \text{ cm}$

Circle the correct formula.

[1 mark]

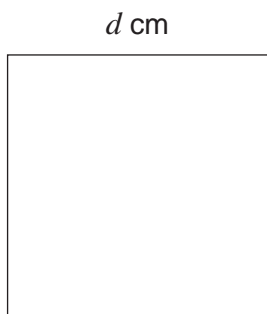
$P = l + w$

$P = lw$

$P = 2(l + w)$

$P = 2lw$

15 (b)



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

Circle the correct formula.

[1 mark]

$A = 2d$

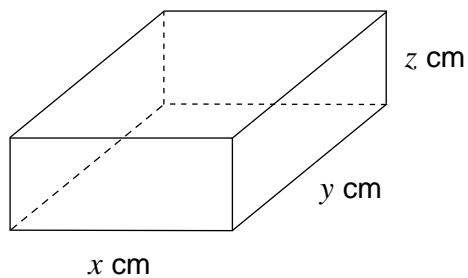
$A = 4d$

$A = \sqrt{d}$

$A = d^2$



15 (c)



The surface area of the cuboid is $S \text{ cm}^2$

Circle the correct formula.

[1 mark]

$$S = xyz$$

$$S = (xyz)^2$$

$$S = 6xyz$$

$$S = 2(xy + xz + yz)$$

15 (d)

The surface area of a **cube** is 150 cm^2

Work out the volume of the cube.

[4 marks]

Answer _____ cm^3



***16** The same type of shirt is sold in two shops.

Shop A



£19.90

Buy one
get second for half price

Shop B



£18

Get a 15% discount
when you buy two

Which shop is cheaper for buying **two** of these shirts?
You **must** show your working.

[5 marks]

Answer _____



17 Jacques travels 240 km in 2 hours 30 minutes.

Work out his average speed.
State the units of your answer.

[3 marks]

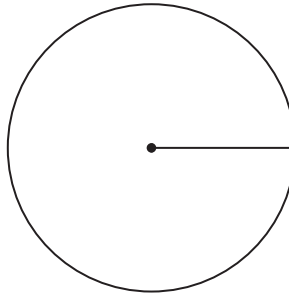
Answer _____

Turn over for the next question



18 (a) The radius of this circle is 2.5 cm

Not drawn accurately



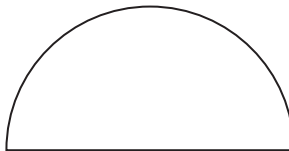
Work out the area.
Give your answer to 1 significant figure.

[3 marks]

Answer _____ cm²

18 (b) The diameter of this semicircle is 16 cm

Not drawn accurately



Work out the perimeter of the semicircle.

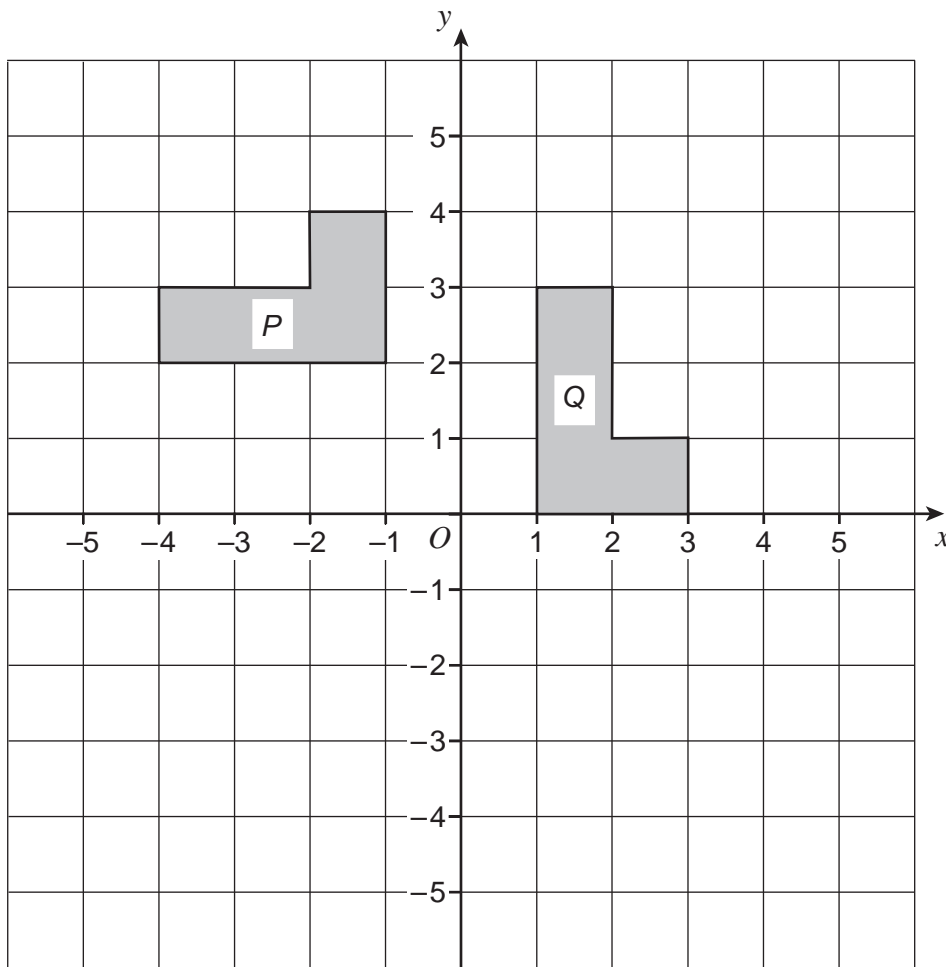
[3 marks]

Answer _____ cm



19 (a) Describe fully the **single** transformation that maps shape *P* to shape *Q*.

[3 marks]



19 (b) On the grid, translate shape *Q* by vector $\begin{pmatrix} 1 \\ -5 \end{pmatrix}$

[2 marks]



***20**

Use trial and improvement to find a positive solution to $x^3 - 10x = 6$
Give your answer to 1 decimal place.

[4 marks]

x	$x^3 - 10x$	Comment
4	24	Too big

$x =$ _____



21 Ali is going to drive 210 miles.
He has 27 **litres** of petrol in his car.
His car travels 36 miles for each **gallon** of petrol.

Does he have enough petrol for the journey?
You **must** show your working.

[4 marks]

Answer _____

END OF QUESTIONS

8



There are no questions printed on this page

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