Answers.

the PiXL club
partners in excellence

Pre Paper 3F Predicted Paper June 2017

GCSE Mathematics (AQA style)

Foundation Tier

Name .....

Class .....

TIME ALLOWED

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- You are permitted to use a calculator in this paper.
- You may use the π button on your calculator or you may take the value of π to be 3.142.
- Do all rough work in this book.

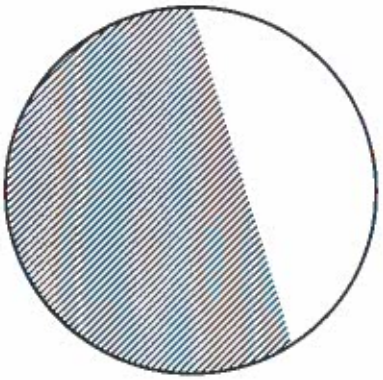
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets at the end of each question or part question on the Question Paper.
- You are reminded of the need for clear presentation in your answers.
- The total number of marks for this paper is **80**.
- The questions included in this paper have been selected from parts of the specification not tested in Paper 1 or Paper 2. You should not assume, however, that because a topic appeared on Paper 1 or Paper 2, it will not appear on Paper 3, nor can the topics here be regarded as an exhaustive list of those to be examined on Paper 3.

Question	Mark	out of
1		1
2		1
3		1
4		1
5		4
6		3
7		3
8		5
9		8
10		4
11		5
12		5
13		4
14		2
15		4
16		3
17		2
18		3
19		5
20		3
21		3
22		2
23		1
24		3
25		4
Total		80

Answer **all** questions in the spaces provided

1



What is the correct name for the shaded region?

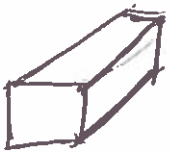
Circle your answer.

[1 mark]

arc radius sector segment.

2 A prism has 7 faces.

How many edges does it have?



6 faces has 12 edges

Circle your answer.

[1 mark]

7 10 12 15.

3rd

3 What is 7.5962, rounded to 3 significant figures?

Circle your answer.

[1 mark]

7.596 7.60 7.6 7.59

must show 3 numbers.

4 Sophie wants to find out about the types of holiday taken by people in the town where she lives.

She decides to compile a questionnaire and conduct a survey.

Which word describes the data she will collect?

Circle your answer.

[1 mark]

continuous discrete primary secondary

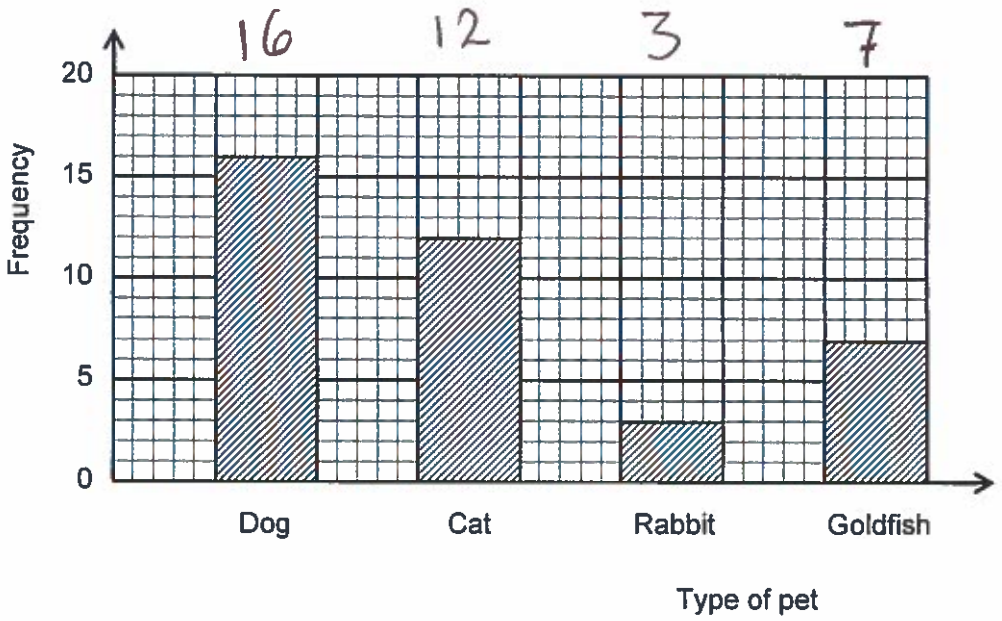
Primary - Collected by her

Secondary - Collected from data like magazine,

discrete - Data that goes up in steps eg numbr of Cars in a class room

Continous - Date which can take on any value eg time, Angle, length, weight.

5



The bar chart shows the numbers of different types of pets owned by students in class D1

5 (a) What is the ratio of dogs to cats?

Give your answer in its simplest form.

[2 marks]

D : C
16 : 12
8 : 6
4 : 3

Answer 4:3

5 (b) In class D1, everybody owns at least one pet.
Nobody owns more than two pets.
There are 30 students in class 3B.

How many students in class 3B own two pets?

[2 marks]

Total Pets = 16 + 12 + 3 + 7 = 38

38 pets − 30 students = 8

Answer 8

6 (a) Trevor uses his calculator to find the value of $\frac{16.68}{2.78 + 5.56}$. $= \frac{16.68}{8.34}$

He says the result is 11.56.

Trevor is **wrong**.

Calculate the correct result.

[2 marks]

$16.68 \div 8.34 = 2$

Answer 2

6 (b) Heather says that $\frac{16.68}{2.78} + 5.56 = 11.56$.

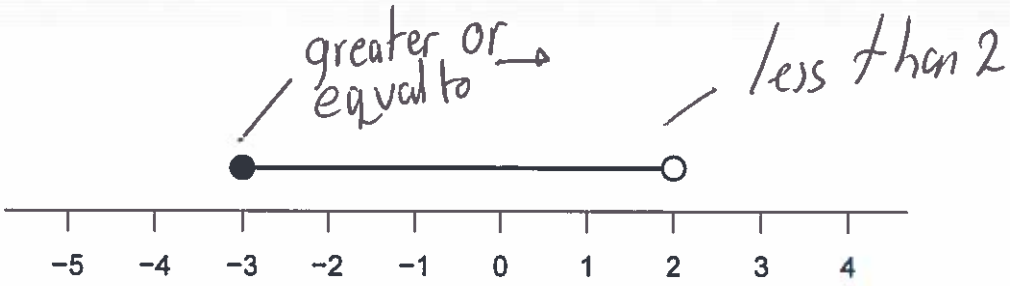
Heather is **correct**.

What mistake did Trevor make when he obtained $\frac{16.68}{2.78 + 5.56} = 11.56$?

[1 mark]

Trevor calculated 16.68 ÷ 2.78 then added 5.56
He didn't use the correct order of operation.

7 (a)



The number line shows the solution set of an inequality.

What is the inequality?

Circle your answer.

[1 mark]

$-3 < x < 2$ $\quad -3 < x \leq 2$ $\quad -3 \leq x < 2$ $\quad -3 \leq x \leq 2$

7 (b) Solve the inequality $2x + 7 < 15$.

[2 marks]

$2x + 7 = 15$ Subtract 7

$2x = 8$ divide by 2

$x = 4$ put inequality back.

Answer $x < 4$

8

Margaret plays tennis.

She has four shirts, coloured blue, red, white, and yellow.
She has three pairs of shorts, coloured green, red and white.

8 (a) Write down all the combinations of shirts and shorts she could wear.

One has been done for you.
You may not need all the spaces.

[3 marks]

Shirt	Shorts
blue	green
B	R
B	W
R	G
R	R
R	W
W	G
W	R
W	W
Y	G
Y	R
Y	W

← Same colour

← Same colour

8 (b) Margaret puts on a shirt and a pair of shorts at random.

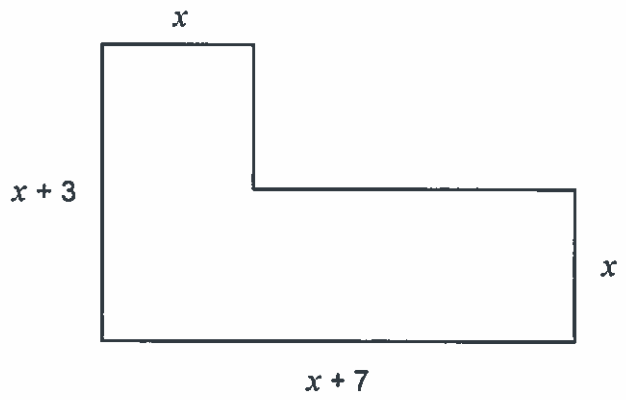
What is the probability that they are the same colour?

[2 marks]

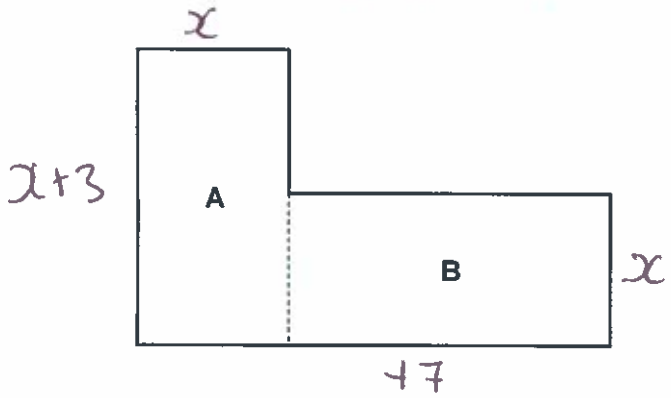
$\frac{2}{12} = \frac{1}{6}$

Answer _____

9 Fred and Jane are looking at this shape.



9 (a) Fred says "I can find its area by splitting it into two rectangles, **A** and **B**".



(i) Write down an expression for the area of rectangle **A**.

[1 mark]

$x \times (x+3)$

Answer $x^2 + 3x$

(ii) Write down an expression for the area of rectangle **B**.

[1 mark]

Answer $7x$

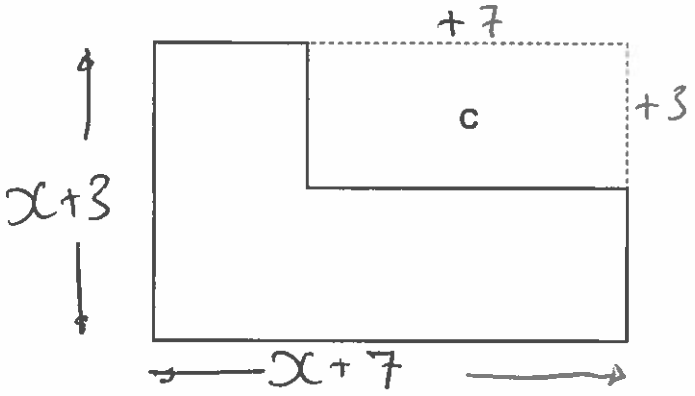
(iii) Use your answers to **(a) (i)** and **(a) (ii)** to find a simplified expression for the area of the whole shape.

[2 marks]

$x^2 + 3x + 7x = x^2 + 10x$

Answer

9 (b) Jane says "I can find its area by finding the area of a single large rectangle, then subtracting the area of a smaller rectangle, **C**".



	x	+3
x	x^2	3x
+7	7x	+21

(i) Write down an expression for the area of the large rectangle.

[1 mark]

Answer $x^2 + 10x + 21$

(ii) Write down an expression for the area of rectangle **C**.

[1 mark]

Answer $+21$

(iii) Use your answers to **(b) (i)** and **(b) (ii)** to find a simplified expression for the area of the whole shape.

[2 marks]

$x^2 + 10x + 21 - 21$

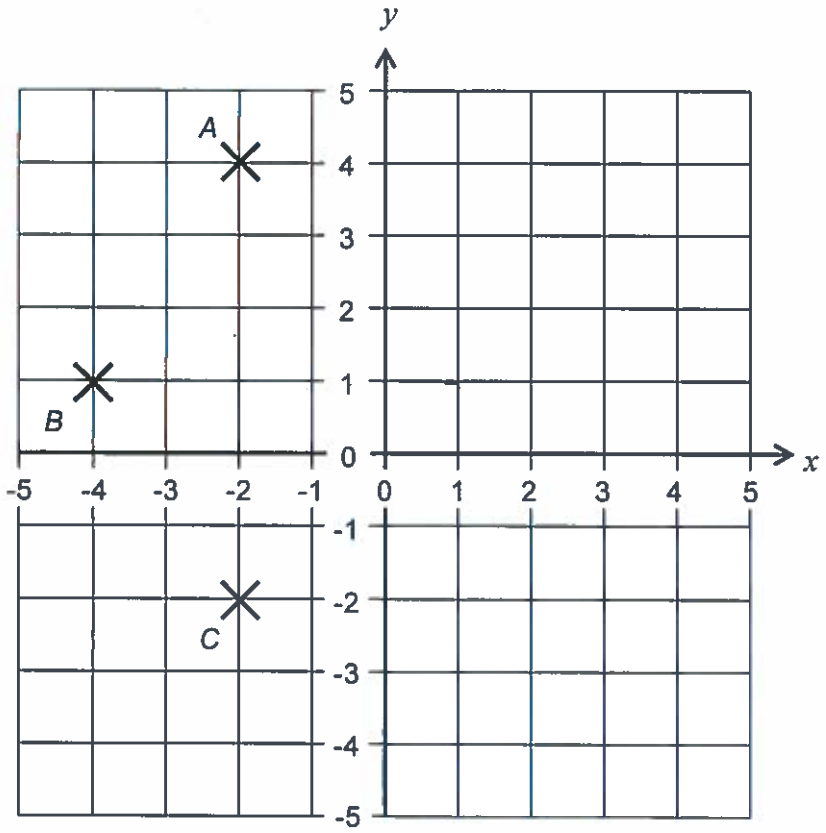
Answer $x^2 + 10x$

10 *ABCD* is a kite.

Points *A*, *B* and *C* are shown on the diagram.

10 (a) Write down the co-ordinates of point *B*. x axis first **[1 mark]**

Answer (-4 , 1)



10 (b) None of the interior angles of *ABCD* are reflex angles.

Find the co-ordinates of **two** of the possible locations for point *D*.

[3 marks]

Answer (1 , 1)

and (2 , 1)

3 , 1

4 , 1

11 (a) Solve $\frac{2x + 3}{5} = 7$. mult by 5

[2 marks]

$2x + 3 = 35$ subtract -3

$2x = 32$ ÷ 2

$x = 16$

Answer _____

11 (b) Solve $3z + 17 = 5 - 3z$. add 3z

[3 marks]

$6z + 17 = 5$ take 17

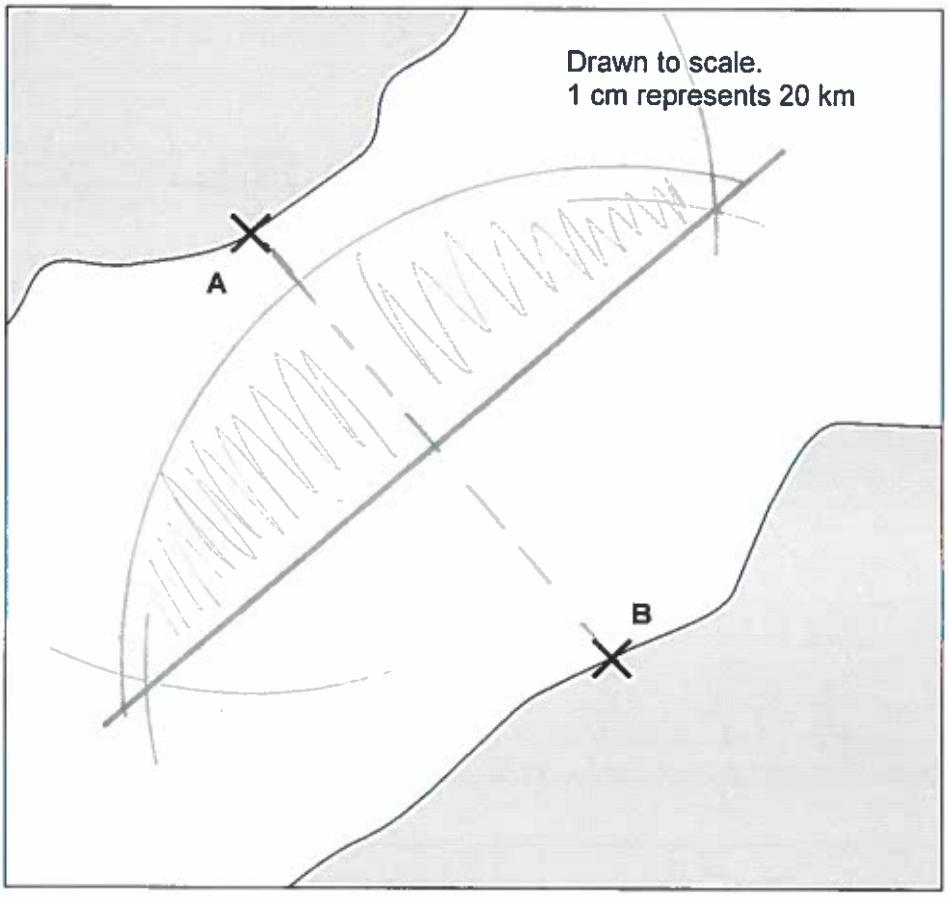
$6z = -12$

÷ 6

$z = -2$

Answer $= -2$

12



The map shows the location of two ports, **A** and **B**.

It is accurately drawn. On the map, 1 cm represents 20 km.

A ship is located closer to **A** than to **B**, and is less than 130 km from **B**.

12 (a) Show accurately on the map the region in which the ship must be located.

[3 marks]

12 (b) Express the scale "1 cm represents 20 km" using a ratio in the form $1 : n$.

[2 marks]

1 km = 100,000 cm

1 cm : 20 km

1 : 2,000,000

Answer 1 : 2,000,000

13 A television producer is selecting an audience to watch a show being recorded.

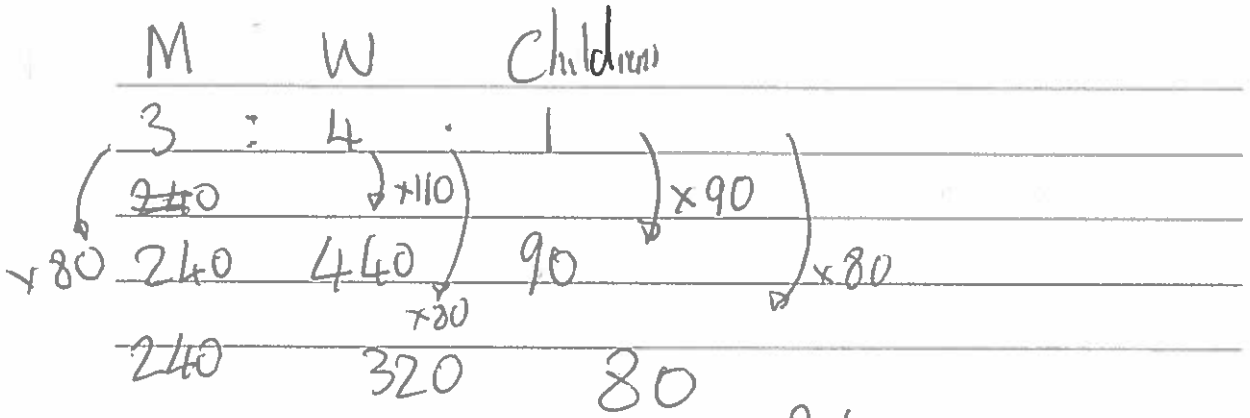
He wants the audience to be as big as possible.

The numbers of men, women and children in the audience must be in the ratio 3 : 4 : 1.

240 men, 440 women and 90 children apply to watch the show being recorded.

How many men, women and children are selected to be in the audience?

[4 marks]

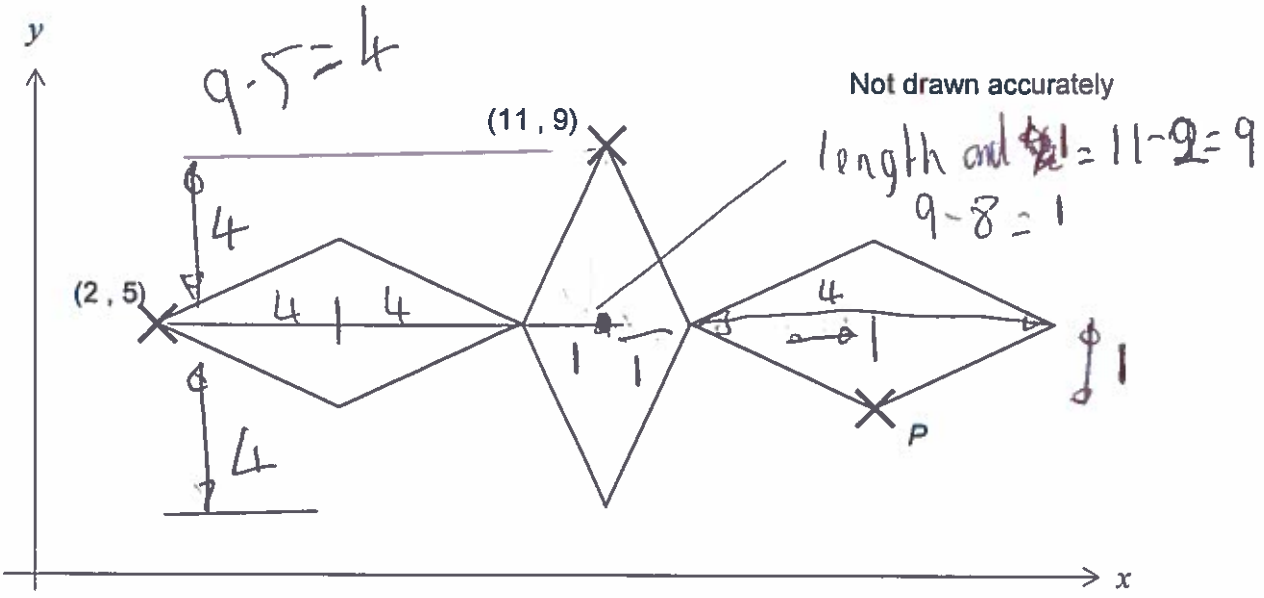


Answer 240 men

320 women

80 children

14



The diagram shows three rhombuses on a co-ordinate grid.

The rhombuses are all congruent to each other.

The lines of symmetry of each rhombus are parallel to the x and y axes respectively.

The co-ordinates of two of the vertices of the rhombuses are given on the diagram.
Point P is located at a vertex of one of the rhombuses.

Find the co-ordinates of point P.

[2 marks]

Longer diagonal $(9-5) \times 2 = 8$

Shape side $(11-(2+8) \times 2$

Answer (16 , 4)

15 Pete lays bricks on Monday, Tuesday and Wednesday.

On Monday, Pete lays 650 bricks.

On Tuesday, he lays 14% more than he did on Monday.

15 (a) How many bricks did he lay on Tuesday?

[2 marks]

$\frac{650 \times 14}{100} = 91$ bricks

650 + 91 bricks = 741

Answer 741

15 (b) By the end of Wednesday, Pete had laid 2 000 bricks.

What percentage of these bricks did he lay on Wednesday?

[2 marks]

monday 650 Tuesday 741

Wed) = 2000 − (650 + 741) = 609

$\frac{609}{2000} \times 100 = 30.45$

Answer 30.45%

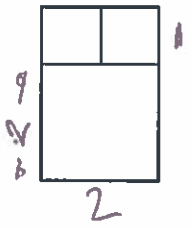
16 Delphi is making a pattern using rectangles.

She starts with two squares, each with side length 1 cm, to make a rectangle whose longest side is 2 cm.

Rectangle 1

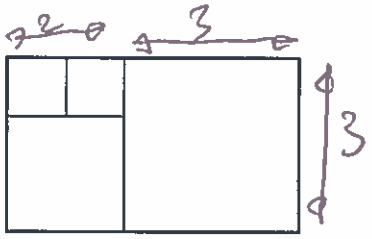
She adds a third square, with side length 2 cm, to this rectangle to make a new rectangle whose longest side is 3 cm.

Rectangle 2



Then she adds a fourth square, as shown in the diagram, to make a new rectangle.

Rectangle 3



16 (a) What is the length of the longest side of **Rectangle 4**?

Circle your answer.

[1 mark]

5cm

3 cm 5 cm 6 cm 8 cm

16 (b) What is the length of the longest side of **Rectangle 8**?

[2 marks]

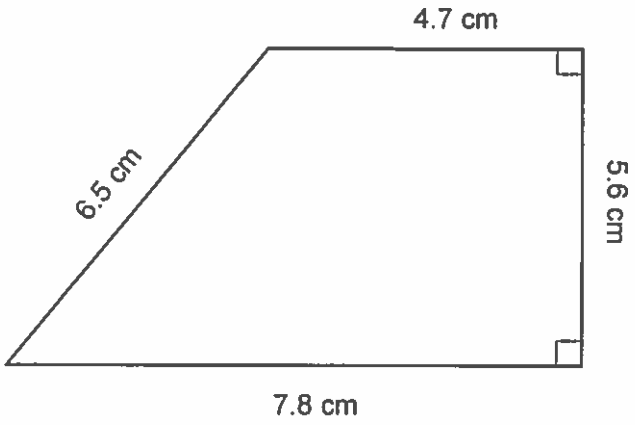
Fibonacci

Pattern	2	3	5	8	13	21	34	55
Rectangle	1	2	3	4	5	6	7	8

55

Answer _____ cm

17



Not drawn accurately

Find the area of this trapezium.

[2 marks]

$\frac{4.7 + 7.8}{2} \times 5.6 = 35\ cm^2$

Answer 35 cm^2

18 Breakfast cereal is sold in three sizes.

2000g

Which of the three sizes of cereal box is the best value for money?

Tick a box.

You must show your working out.

[3 marks]

- [ ] Standard.
- [x] Large.
- [ ] Extra value.

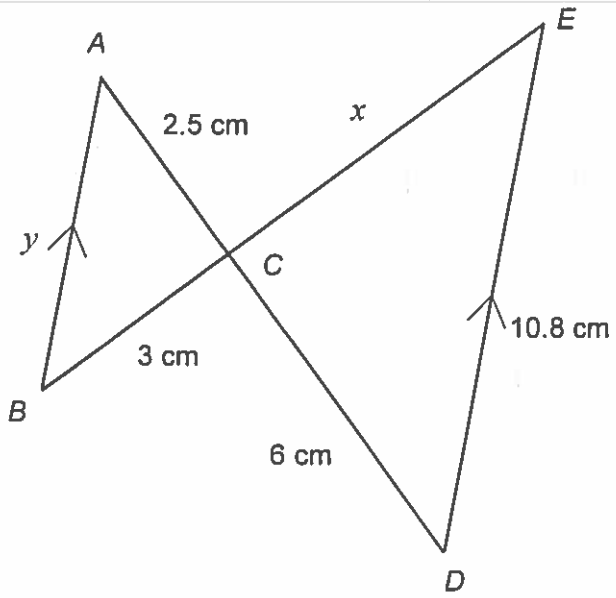
Standard | Large | Extra

g : £ | g : £ | g : £

500 : 1·79 | 750 : 2·60 | 2000 : 6·96

1 : $3 \cdot 58 \times 10^{-3}$ | $3 \cdot 46 \times 10^{-3}$ | 1 : $3 \cdot 48 \times 10^{-3}$

19



Not drawn accurately

In the diagram, *BA* is parallel to *DE*.
ACD and *BCE* are straight lines.

The length of *AC* is 2.5 cm.
The length of *CD* is 6 cm.
The length of *BC* is 3 cm.
The length of *DE* is 10.8 cm.

19 (a) Find the length of *CE*, marked x on the diagram.

[3 marks]

From 2·5 to 6 Scale factor 2·4

3 × 2·4 Scale factor = 7·2

Answer 7·2 cm

19 (b) Find the length of *AB*, marked y on the diagram.

[2 marks]

10·8 ÷ 2·4 = 4·5

Answer 4·5 cm

20 (a) Factorise the expression $x^2 - x - 42$.

[1 mark]

Two numbers which multiplied together give −42 which added give −1

Answer $(x + 6)(x - 7)$

20 (b) Hence solve the equation $x^2 - x - 42 = 0$.

[2 marks]

$x = -6$

$x = +7$

Answer

21 In a scientific experiment, the volume of a substance increases by 8% every day.

At the start of 1 June, the volume was 450 ml.

What was the volume of the substance at the start of 4 June?

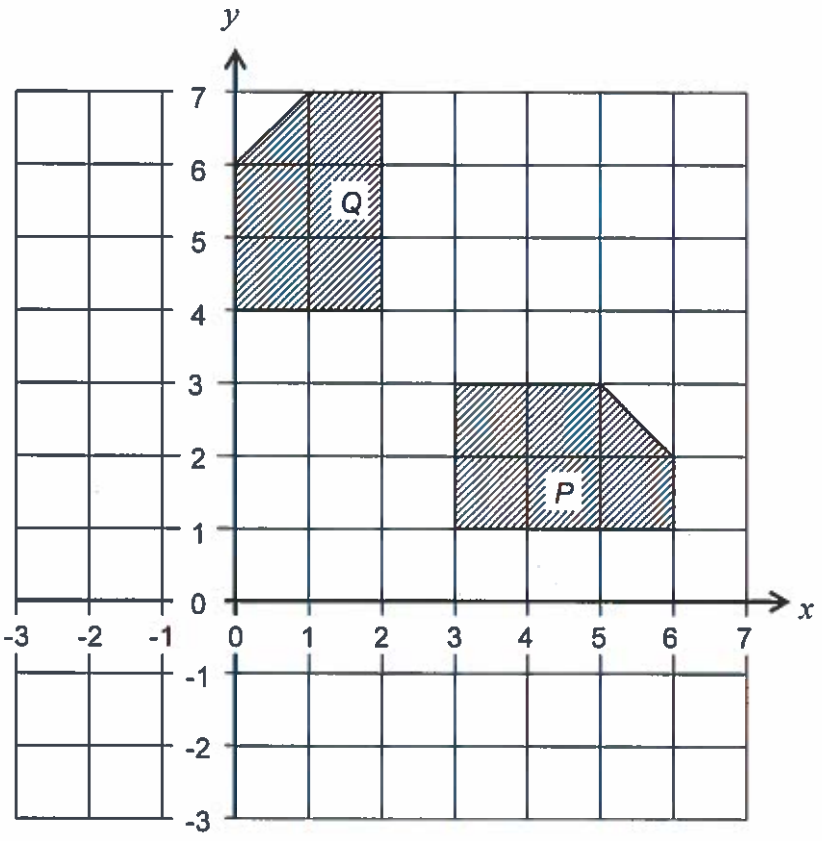
[3 marks]

3 days increase is 1·08

$450 \times 1{\cdot}08^3 = 566{\cdot}87$

Answer 567 ml

22 The diagram shows two shapes, *S* and *T*.



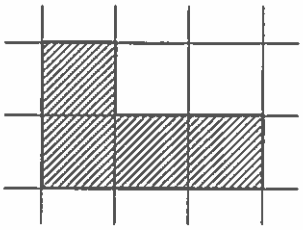
Describe fully the single transformation that transforms shape *P* to shape *Q*.

[2 marks]

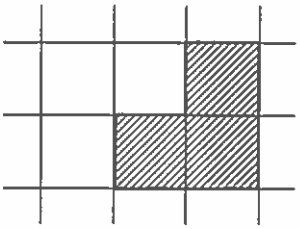
Rotation 90° anti clockwise from centre (1, 2) use tracing paper to find

23 A solid is made using 1cm cubes.

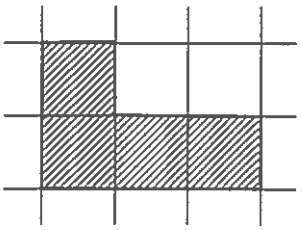
The front elevation, side elevation and plan view of the solid are each drawn on 1cm grids.



front elevation



side elevation



plan view

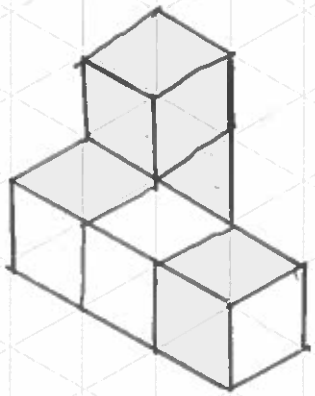
How many 1cm cubes are used to make the solid?

Circle your answer.

[1 mark]

4 5 6 7

You may use the isometric grid below to help work out your answer.



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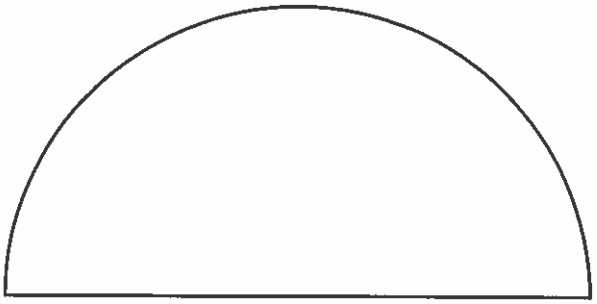

8.4 cm

The diagram shows a semicircle.

Find its perimeter.

[3 marks]

Diameter = 8.4

Circum of full Circle = $\pi \times 8.4 = 26.389$

half circle = 13.194

13.194 + 8.4 = 21.59

Answer 21.6 cm

25 (a) What is the median of the following four numbers?

6 9 2 15

Circle your answer. 2 6 9 15

[1 mark]

$7\frac{1}{2}$ 8 $8\frac{1}{2}$ 13

25 (b) The table shows the numbers of goals scored by a football team in 40 matches.

The team did not score more than three goals in any match.

f

Goals x	Number of matches	fx
0	12	0
1	17	17
2	8	16
3	3	9
Total	40	42

$\Sigma = 40$ $\Sigma = 42$

What was the mean number of goals per match scored by the team?

[3 marks]

$$\text{mean} = \frac{\Sigma fx}{\Sigma f} = \frac{42}{40} = 1.05$$

Answer _____ goals

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