Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
4 – 5	
6 – 7	
8 – 9	
10 – 11	
12 – 13	
14 – 15	
16 – 17	
18 – 19	
20 – 21	
22 – 23	
24 – 25	
26 – 27	
28	
TOTAL	

AQA

General Certificate of Secondary Education
Foundation Tier
June 2014

Methods in Mathematics (Linked Pair Pilot) 93652F

F

Unit 2 Geometry and Algebra

Friday 20 June 2014 9.00 am to 10.30 am

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

Time allowed
- 1 hour 30 minutes

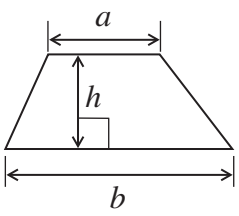
Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this 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.
- The quality of your written communication is specifically assessed in Questions 8, 20 and 26. 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.
- You are expected to use a calculator where appropriate.

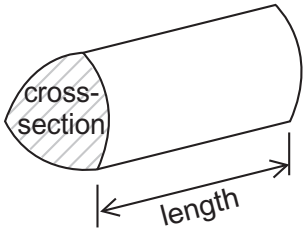
Advice
- In all calculations, show clearly how you work out your answer.

Formulae Sheet: Foundation Tier

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

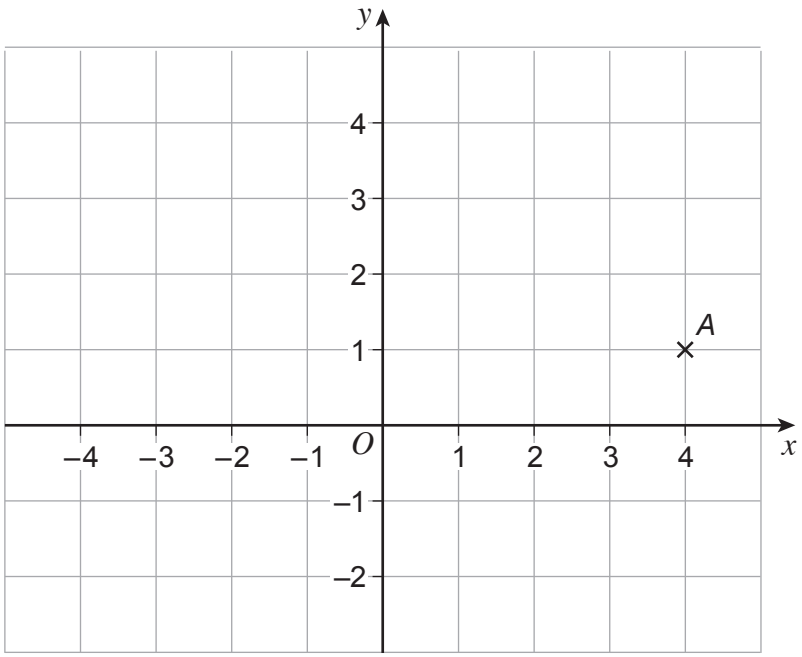


Volume of prism = area of cross-section × length



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

1 Point *A* is marked on the grid.



1 (a) What are the coordinates of *A*?

[1 mark]

Answer (..... , ...)

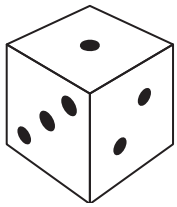
1 (b) Plot and label the point *B* (–2, 4).

[1 mark]

Turn over for the next question

2

2 Steve rolls five ordinary six-sided dice.



The first three dice show scores of 1, 4 and 5

His total score is 21

What are the scores on the last two dice?

[3 marks]

.....

.....

.....

Answer ..... and .....

3 (a) On this grid, draw a trapezium with **one** line of symmetry.

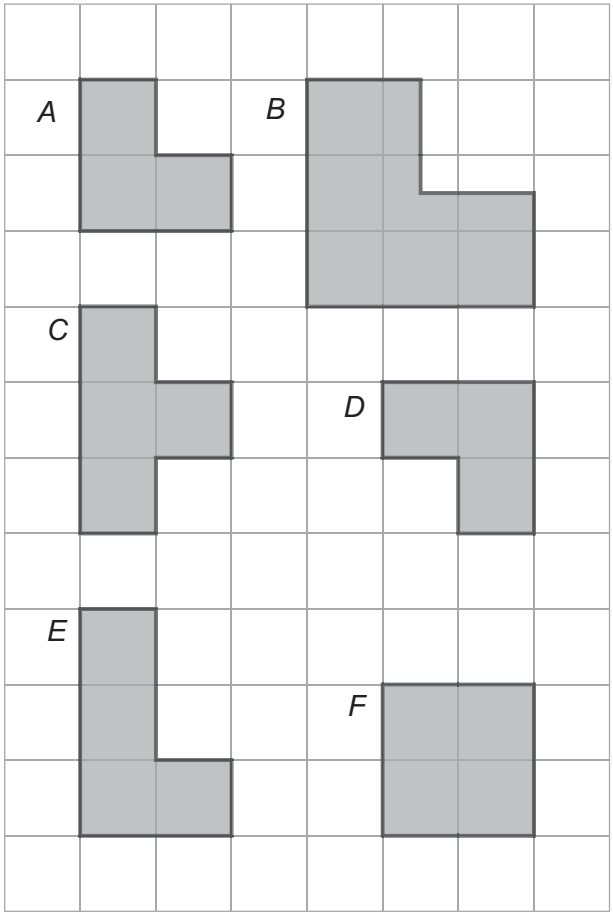
[1 mark]

3 (b) On this grid, draw a trapezium with only **one** acute angle.

[1 mark]

5

4 Six shapes are drawn on the centimetre grid below.



4 (a) Which shape is congruent to shape *A*?

[1 mark]

Answer .....

4 (b) Which shape is similar to shape *A*?

[1 mark]

Answer .....

4 (c) Which shape has **no** lines of symmetry?

[1 mark]

Answer .....

4 (d) Which shape has rotational symmetry of order 4?

[1 mark]

Answer .....

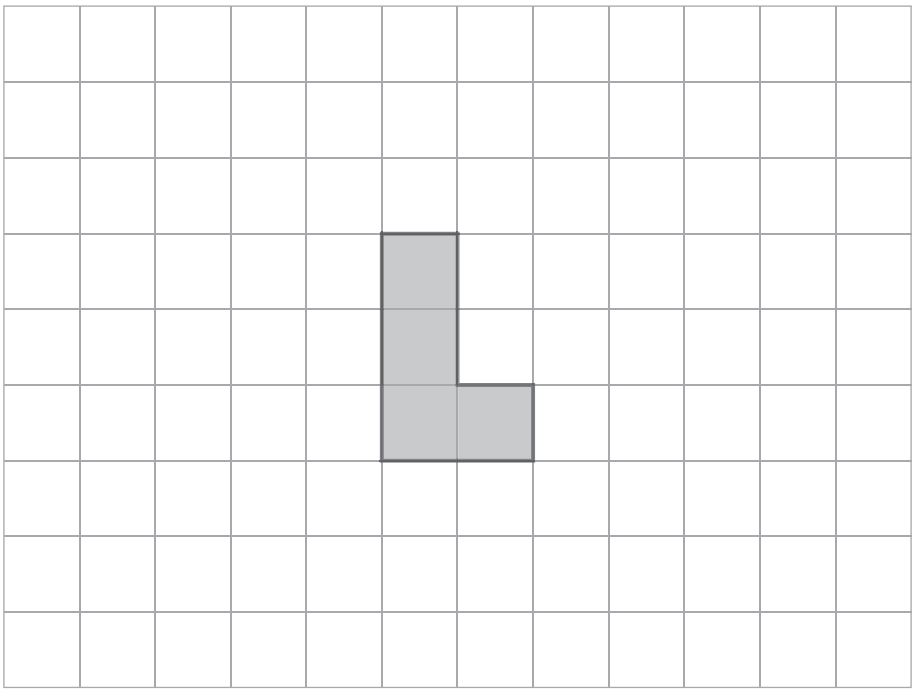
4 (e) Which shape has the same perimeter as shape *C*?

[1 mark]

Answer .....

4 (f) On the grid, draw enough shapes to show how shape *E* will tessellate.

[1 mark]



6

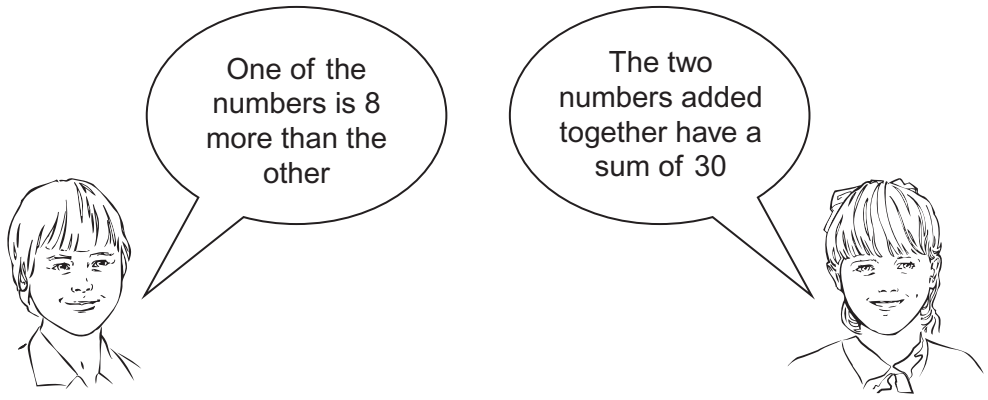
5 (a) Draw a line **parallel** to the line below.

[1 mark]

5 (b) Draw a line **perpendicular** to the line below.

[1 mark]

6 Mick and Molly are talking about two numbers.



Work out the two numbers.

[2 marks]

.....

.....

.....

.....

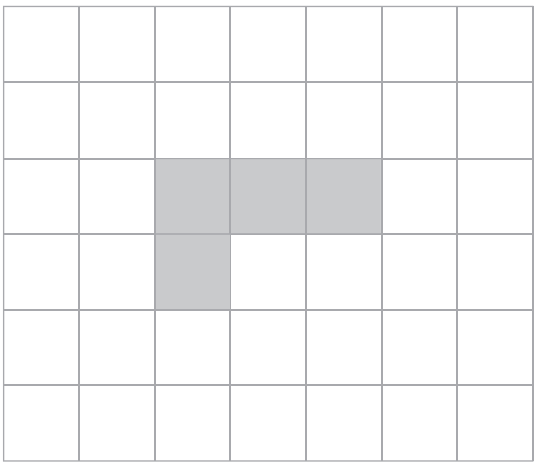
Answer ..... and .....

Turn over for the next question

4

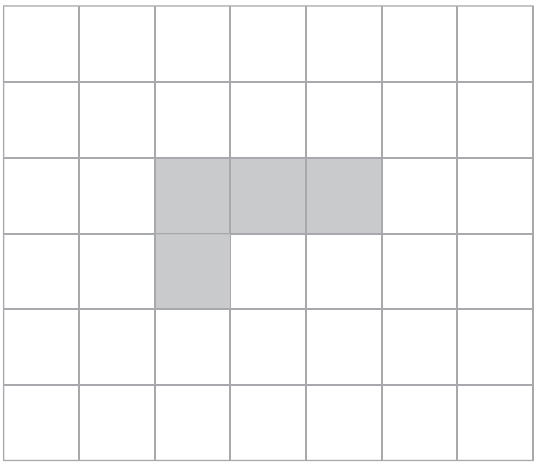
7 (a) Shade in **one** more square so that the shape has one line of symmetry.

[1 mark]



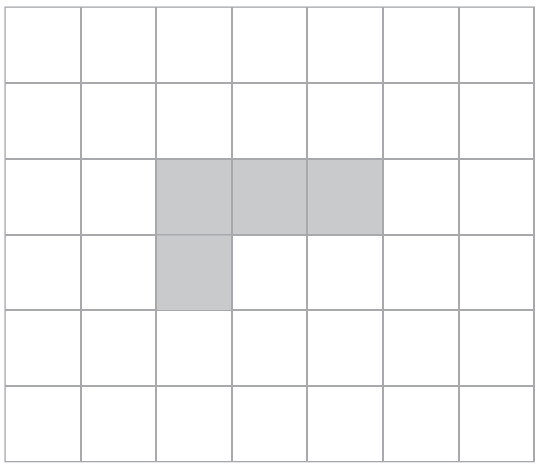
7 (b) Shade in **one** more square so that the shape has a **different** line of symmetry.

[1 mark]



7 (c) Shade in **one** more square so that the shape has rotational symmetry of order 2

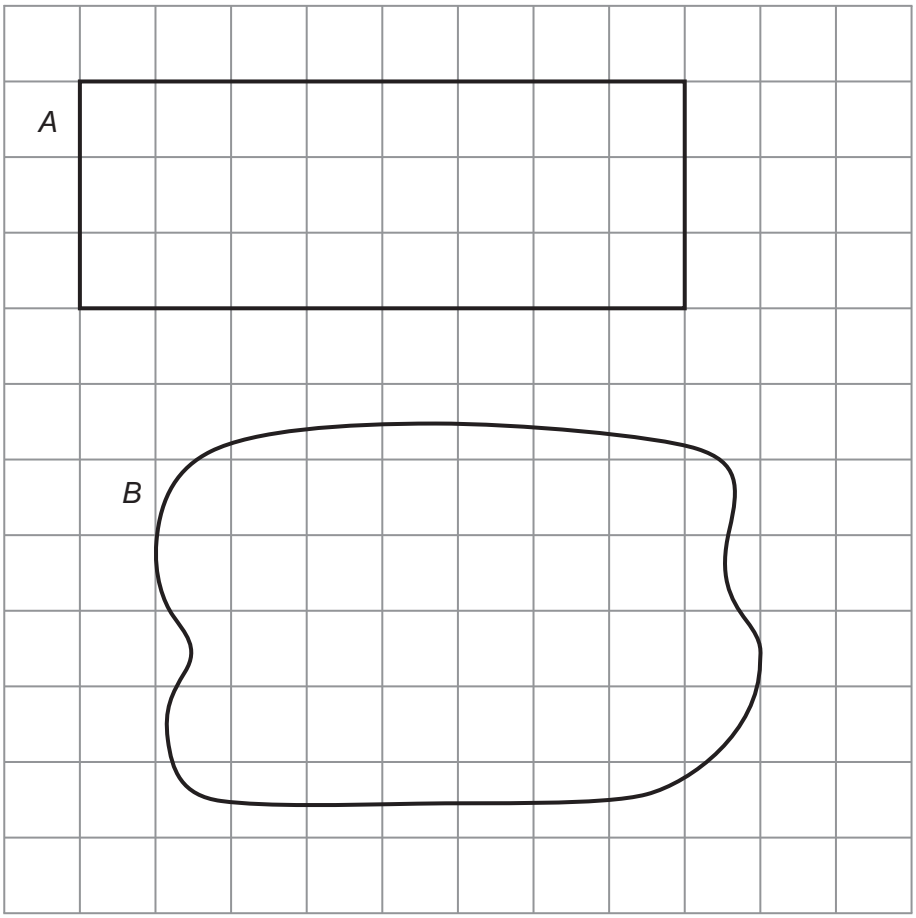
[1 mark]



Turn over for the next question

3

***8** Two shapes, *A* and *B*, are drawn on a centimetre grid.



Which of the two shapes has the greater area?
You **must** show your working.

[3 marks]

.....

.....

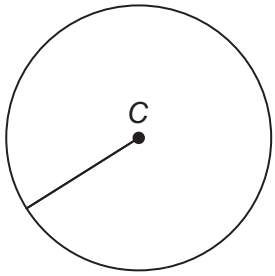
.....

.....

.....

9 (a) Complete the sentence for this circle, centre *C*.

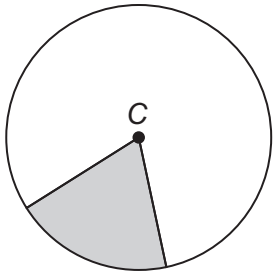
[1 mark]



The straight line from *C* to the circumference is called a .....

9 (b) Complete the sentence for this circle, centre *C*.

[1 mark]



The shaded area is called a .....

9 (c) Write down a difference between a diameter and any other chord.

[1 mark]

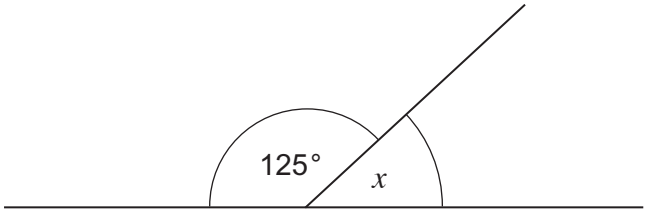
.....

.....

6

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

[1 mark]



Not drawn accurately

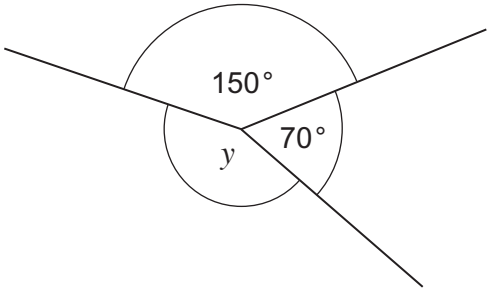
.....

.....

Answer ..... degrees

10 (b) Work out the size of angle y.

[2 marks]



Not drawn accurately

.....

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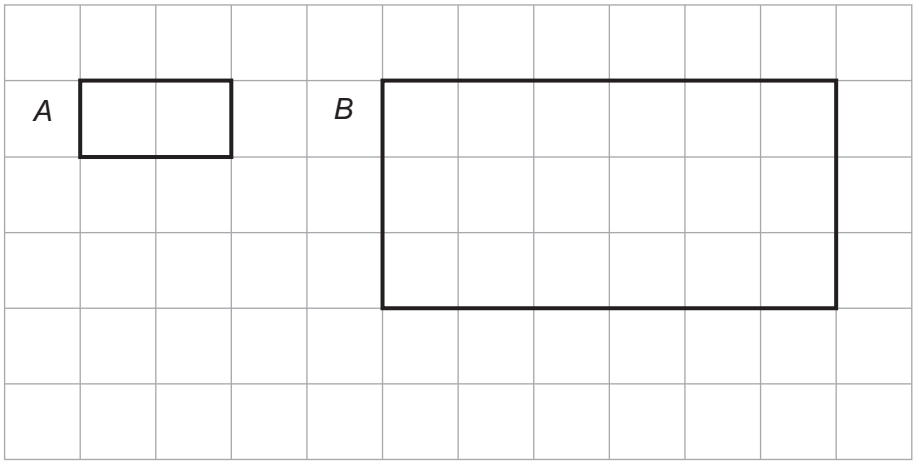
Answer ..... degrees

11 Rectangles *A* and *B* are drawn on a centimetre grid.



11 (a) *B* is an enlargement of *A*.

What is the scale factor of the enlargement?

[1 mark]

.....

Answer .....

11 (b) How many times larger is the area of *B* than the area of *A*?

[2 marks]

.....

.....

.....

6

12 A number, x, is 30 when rounded to the nearest 10

Work out the value of the square root of the least possible value of x.

[2 marks]

Answer .....

13 (a) Simplify $3 \times 2m$

[1 mark]

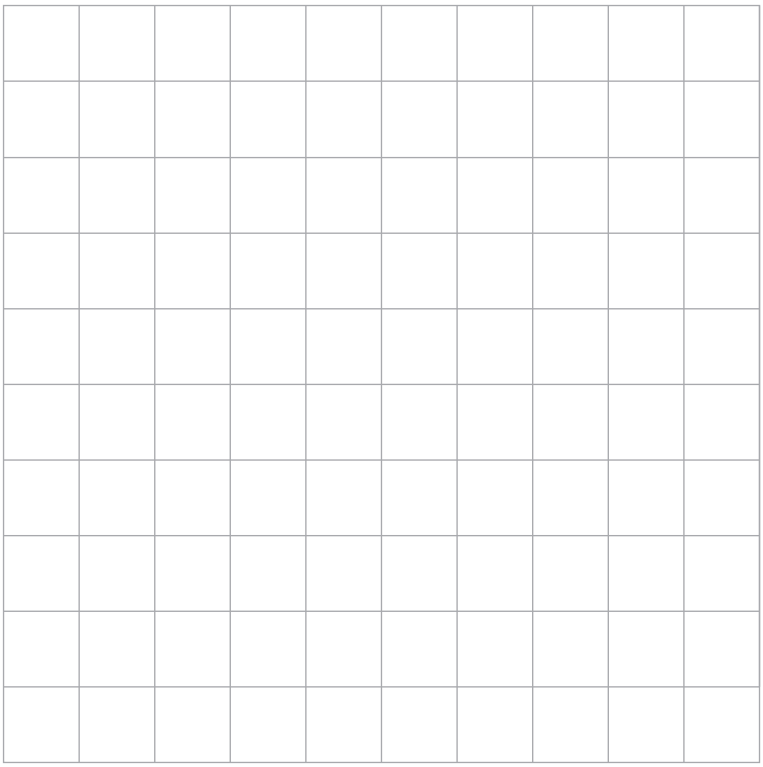
Answer .....

13 (b) Simplify $9x + 2y - 3x + 6y$

[2 marks]

Answer .....

14 Here is a centimetre grid.



On the grid, draw a rectangle with

Perimeter = 18 cm

and

Area = 20 cm^2

[2 marks]

Turn over for the next question

7

15 (a) You are given that $p = m + 5$

Which **one** of the following is true?
Circle your answer.

[1 mark]

$m = p + 5$ $\quad$ $m + p = 5$ $\quad$ $m = 5 - p$ $\quad$ $m = p - 5$

15 (b) Solve $2c - 3 = 13$

[2 mark]

.....

.....

$c =$ .....

16 Keith buys

x cans of cola

2 fewer cans of lemonade than cola

6 more cans of orange than cola

Write an expression in terms of x for the total number of cans he buys.
Simplify your answer.

[3 marks]

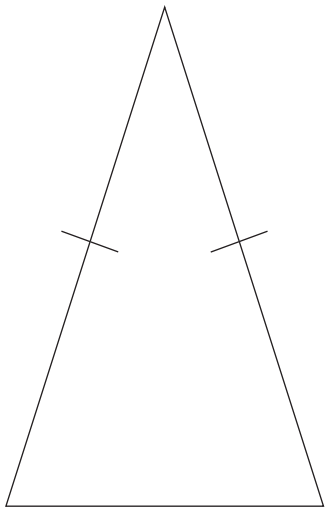
.....

Answer .....

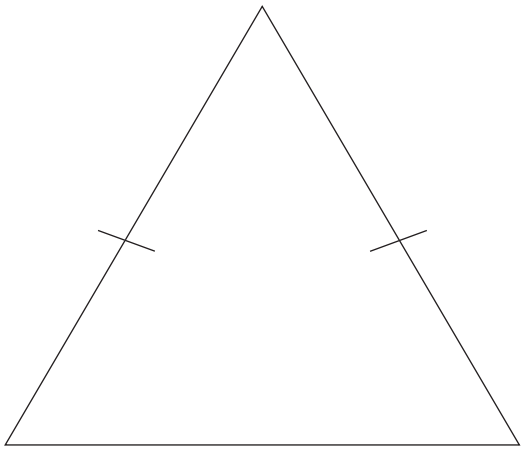
17 An angle in an isosceles triangle is 74°

Fill in three angles on each triangle below to show the **two** possible isosceles triangles.

[3 marks]



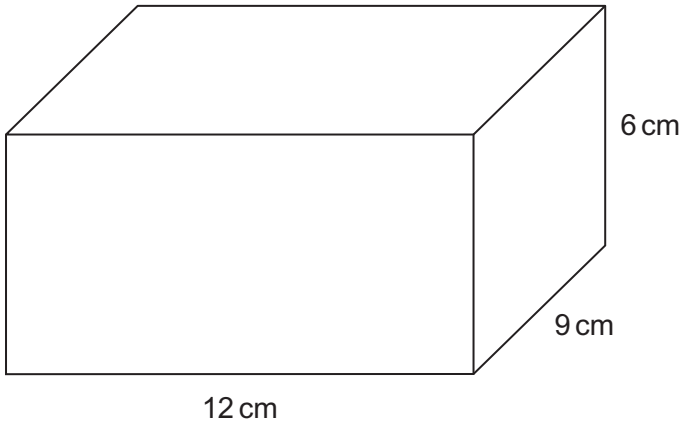
Not drawn accurately



Not drawn accurately

9

18 Here is a cuboid.



18 (a) Work out the volume of the cuboid.
State the units of your answer.

[3 marks]

Answer .....

18 (b) The cuboid is completely filled with identical cubes.
The length of each cube is a whole number of centimetres **greater than** 1

How many cubes are used?

[3 marks]

.....

.....

.....

.....

Answer .....

19 There are 40 counters in a bag.
23 of them are red.

What percentage of the counters is **not** red?

[3 marks]

.....

.....

.....

.....

Answer ..... %

***20** a is an odd number.
b is an even number.

Tick the correct statement.

$a^2 + b^2$	is always even	☐
$a^2 + b^2$	is always odd	☐
$a^2 + b^2$	could be even or odd	☐

Give a reason for your answer.

[2 marks]

.....

.....

.....

11

21 (a) Here is a sequence.

5 8 11 14 17 .....

Write down the next number in the sequence.

Write down the rule for continuing the sequence.

[2 marks]

.....

Next number .....

Rule .....

21 (b) Here is a different sequence.

Work out the nth term of the sequence.

7 13 19 25 31

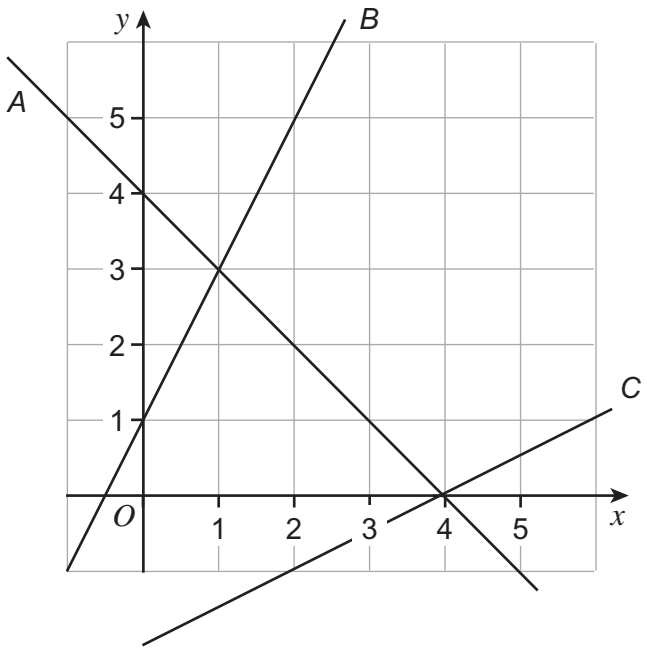
[2 marks]

.....

.....

Answer .....

22 The graph shows three lines *A*, *B* and *C*.



22 (a) Complete these sentences with *A*, *B* or *C* to make them true.

[2 marks]

$y = \frac{1}{2}x - 2$ is the equation of line .....

$x + y = 4$ is the equation of line .....

$y = 2x + 1$ is the equation of line .....

22 (b) Which of the lines does the point (–4, –4) lie on?
Circle your answer.

[1 mark]

$y = \frac{1}{2}x - 2$ $x + y = 4$ $y = 2x + 1$

7

23 Use your calculator to work out $\frac{3.21 + 4.89}{5.62 - 1.89}$ as a decimal.

23 (a) Write down your full calculator display.

[1 mark]

.....

Answer .....

23 (b) Write your answer to 1 decimal place.

[1 mark]

.....

Answer .....

24 (a) As a product of prime factors $40 = 2^3 \times 5$

Write 50 as a product of prime factors.

[2 marks]

.....

.....

Answer .....

24 (b) Work out the Least Common Multiple of 40 and 50

[2 marks]

.....

.....

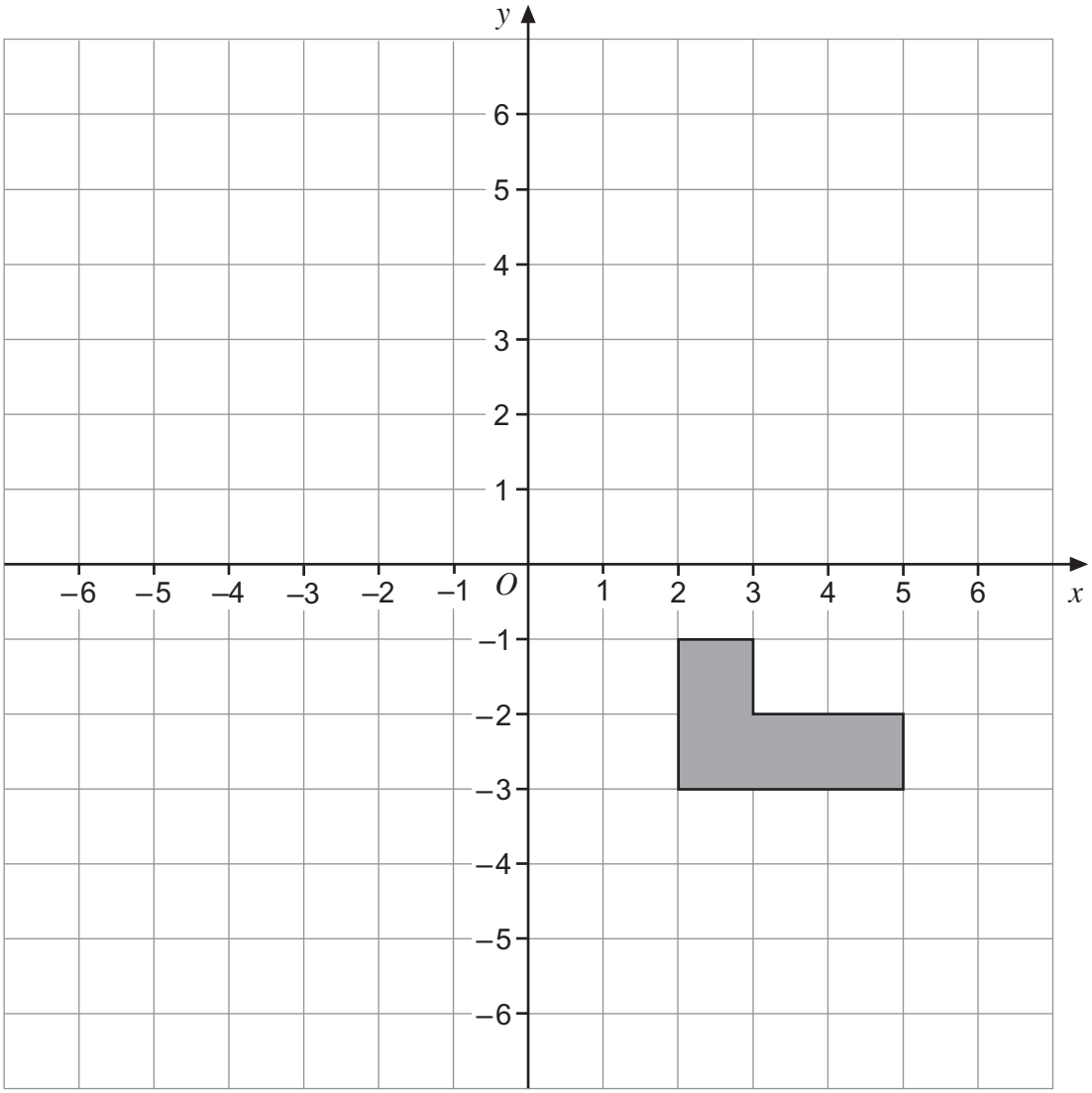
Answer .....

Turn over for the next question

6

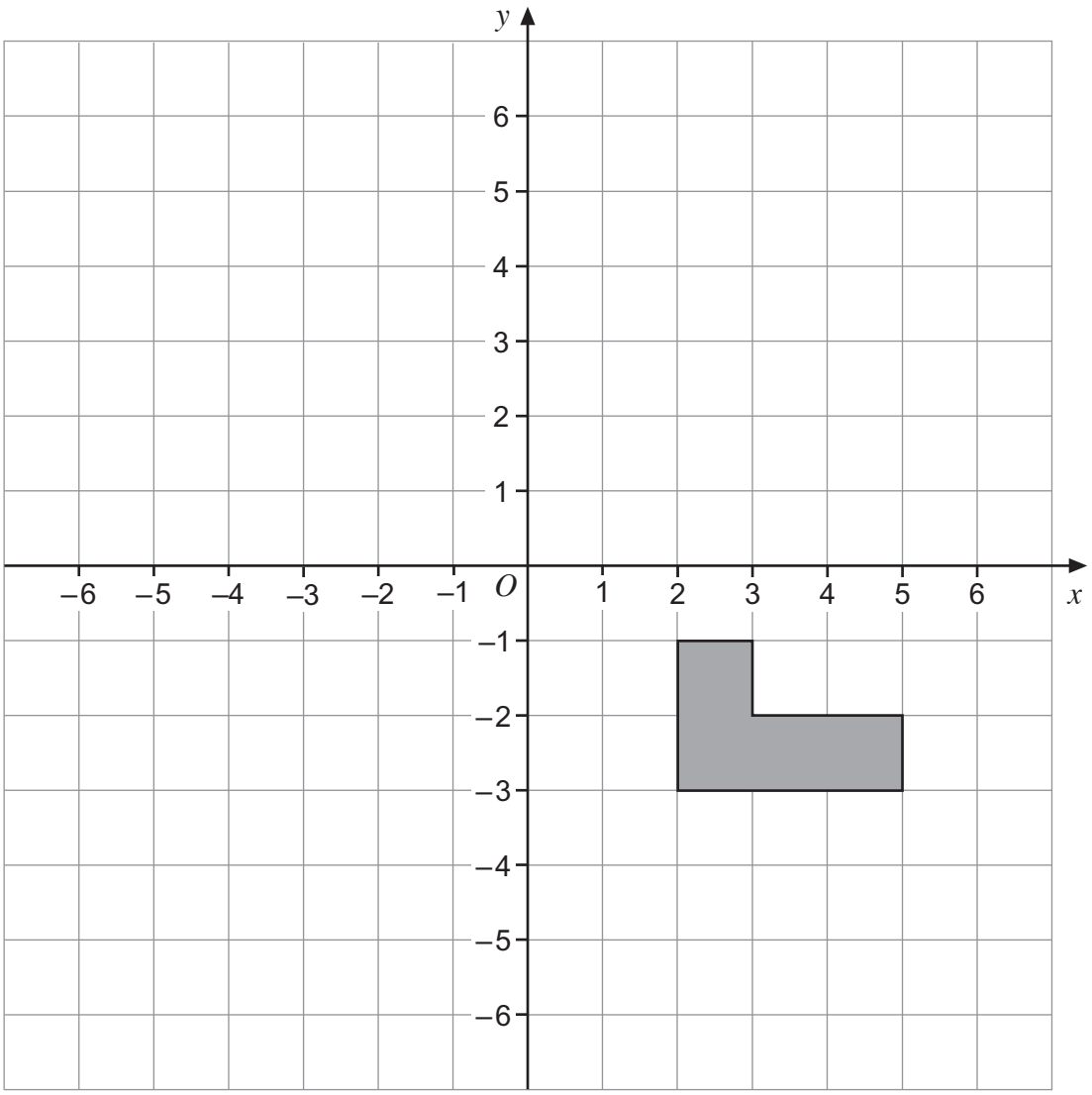
25 (a) Reflect the shape in the line $x = 2$

[2 marks]



25 (b) Translate the shape by the vector $\begin{pmatrix} -5 \\ 6 \end{pmatrix}$.

[2 marks]



Turn over for the next question

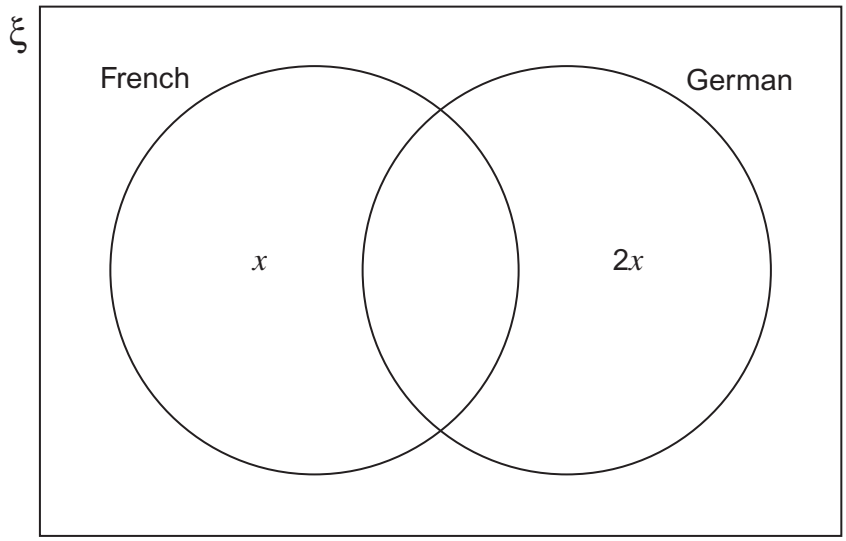
4

26 In a group of 30 students

x students take French **only**

$2x$ students take German **only**

This information is shown in the Venn diagram.



26 (a) 3 students take **both** French and German.
6 students do **not** take either French **or** German.

Add this information to the Venn diagram.

[1 mark]

***26 (b)** Set up and solve an equation to work out the value of x.

[3 marks]

.....

.....

.....

.....

x = ...

END OF QUESTIONS

4