

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
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26 – 27	
28	
TOTAL	



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

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. 	
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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

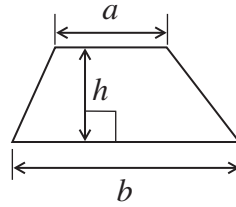
- In all calculations, show clearly how you work out your answer.



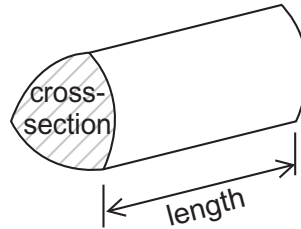
J U N 1 4 9 3 6 5 2 F 0 1

Formulae Sheet: Foundation Tier

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

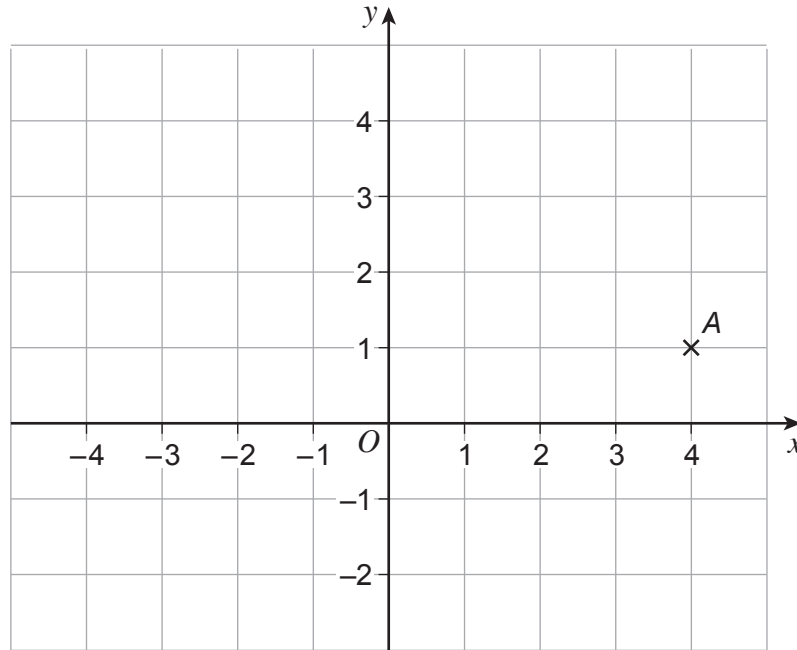


Volume of prism = area of cross-section \times length



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

1 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).

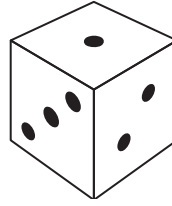
[1 mark]

Turn over for the next question



2 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]

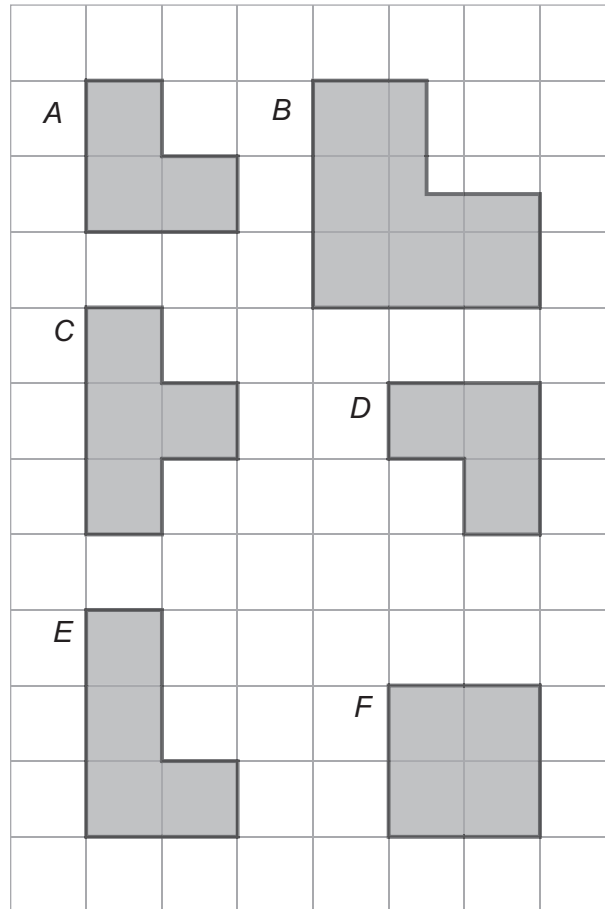


3 (b) On this grid, draw a trapezium with only **one** acute angle.

[1 mark]



- 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

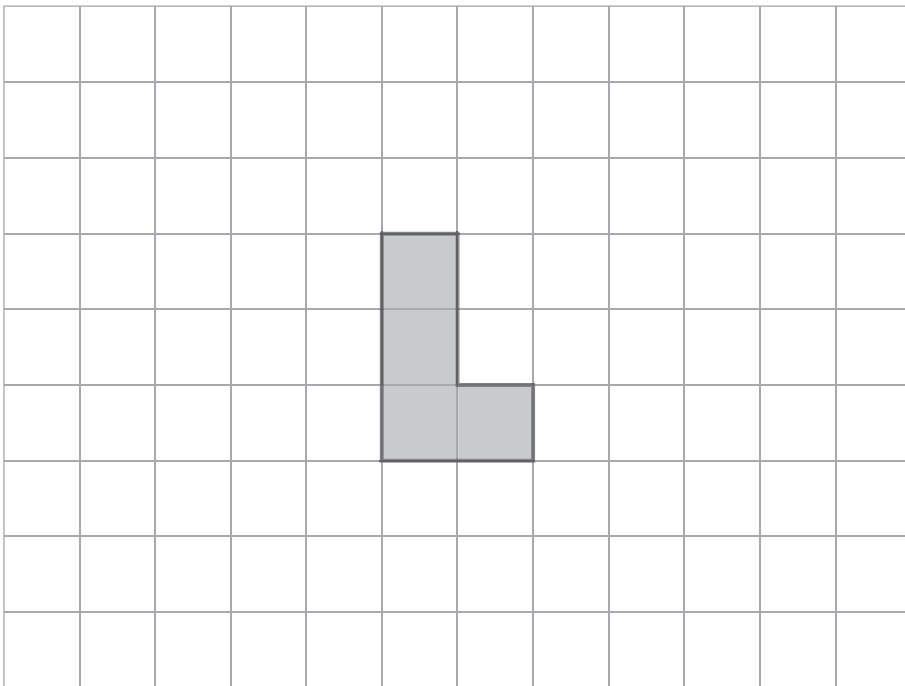
4 (e) Which shape has the same perimeter as shape C?

[1 mark]

Answer

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

[1 mark]



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

[1 mark]

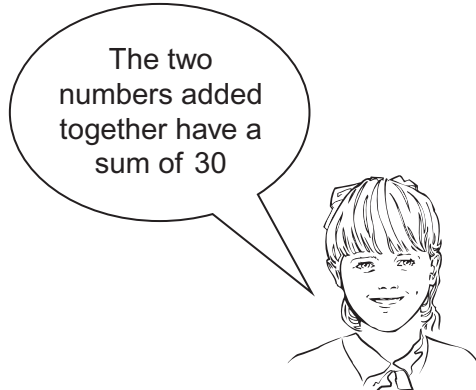
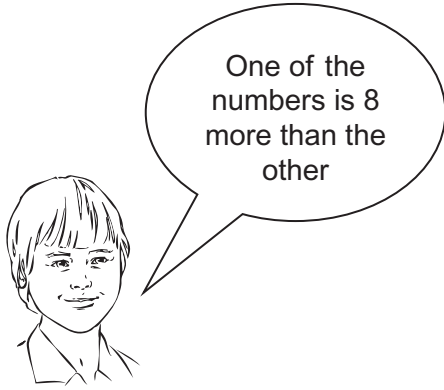


5 (b) Draw a line **perpendicular** to the line below.

[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

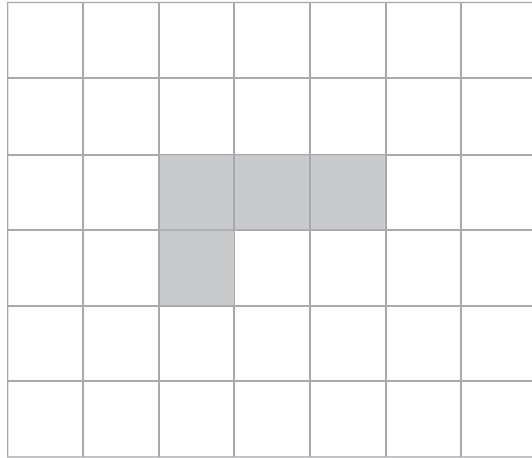
4

Turn over ►



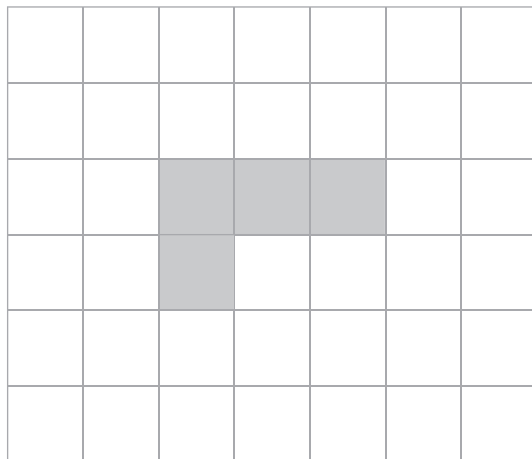
7 (a) Shade in **one** more square so that the shape has one line of symmetry.

[1 mark]



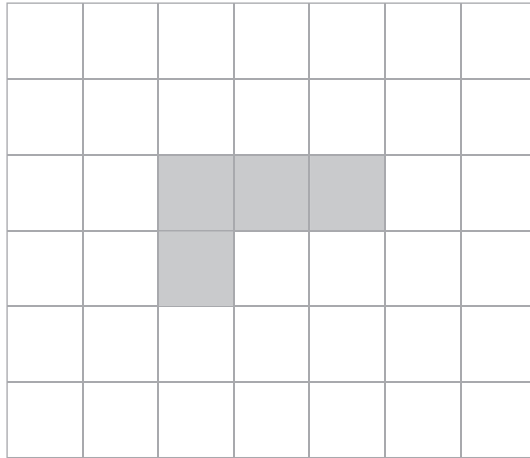
7 (b) Shade in **one** more square so that the shape has a **different** line of symmetry.

[1 mark]



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

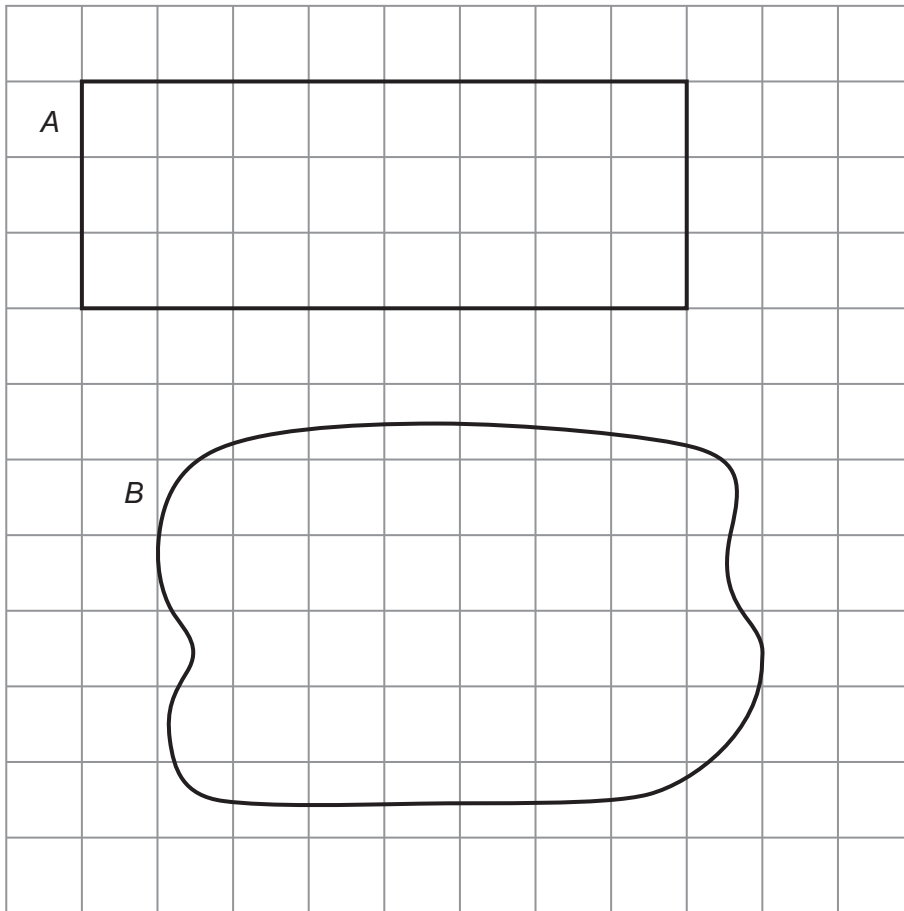
[1 mark]



Turn over for the next question



*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]

.....

.....

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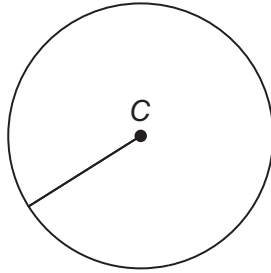
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9 (a) Complete the sentence for this circle, centre C.

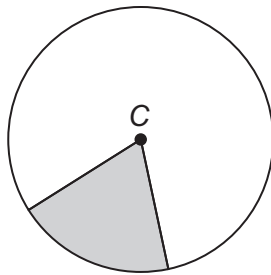
[1 mark]



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.

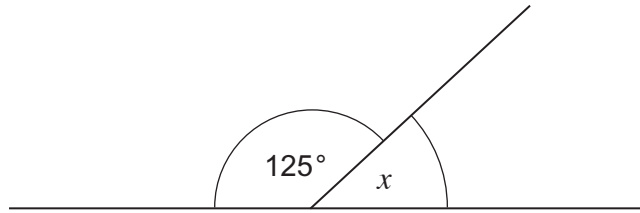
[1 mark]

.....
.....



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

[1 mark]



Not drawn
accurately

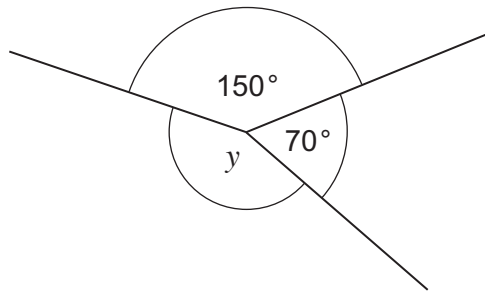
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Answer degrees

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

[2 marks]



Not drawn
accurately

.....

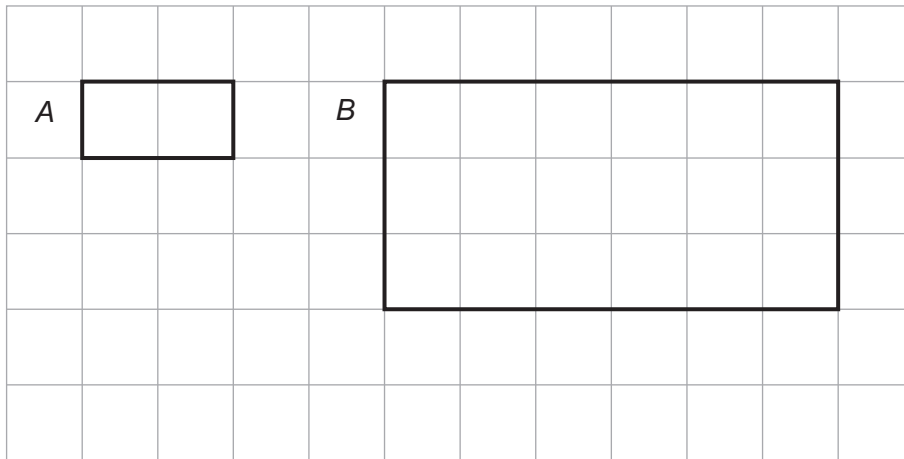
.....

.....

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]

.....
.....
.....



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

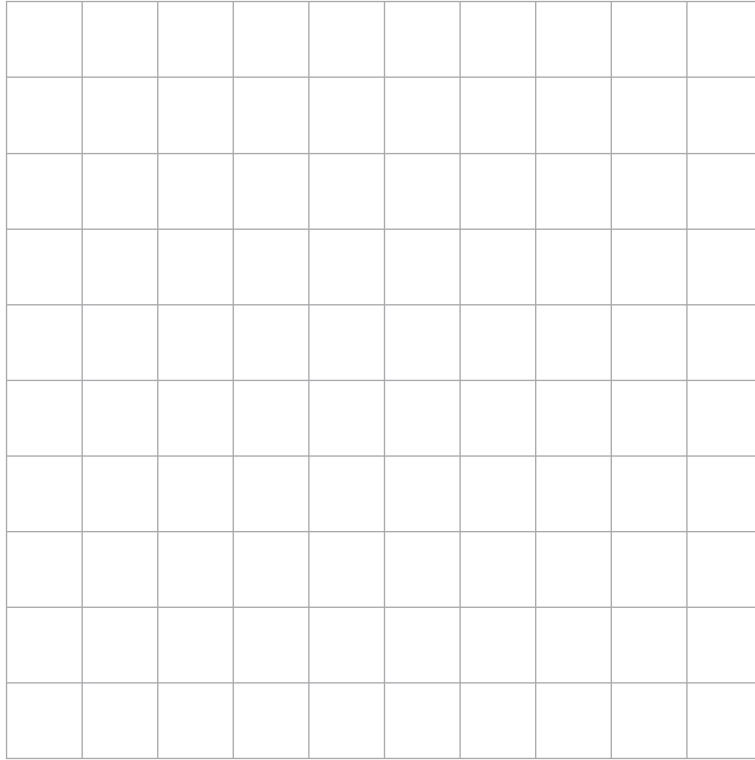
13 (b) Simplify $9x + 2y - 3x + 6y$

[2 marks]

Answer



14 Here is a centimetre grid.



On the grid, draw a rectangle with

Perimeter = 18 cm

and

Area = 20 cm²

[2 marks]

Turn over for the next question



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

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

[1 mark]

$m = p + 5$

$m + p = 5$

$m = 5 - p$

$m = p - 5$

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.

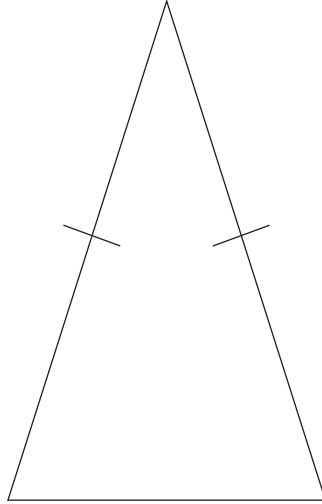
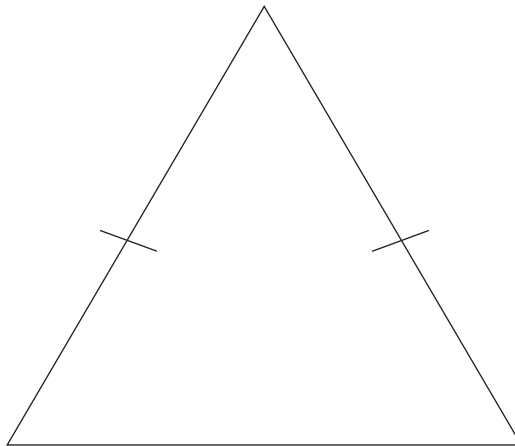
[3 marks]

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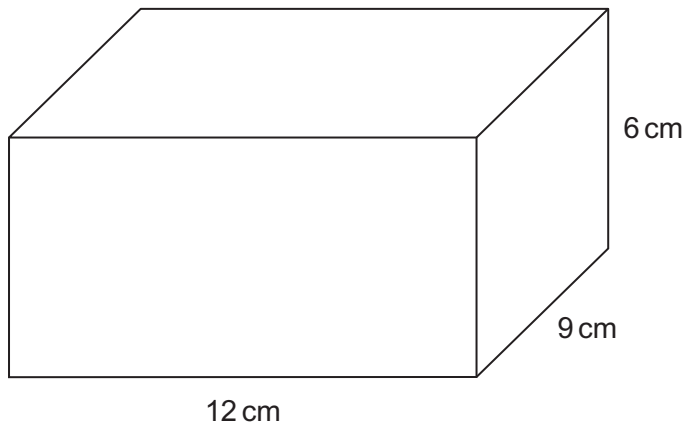
Answer



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
accuratelyNot drawn
accurately

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]

.....
.....
.....



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 n th term of the sequence.

7 13 19 25 31

[2 marks]

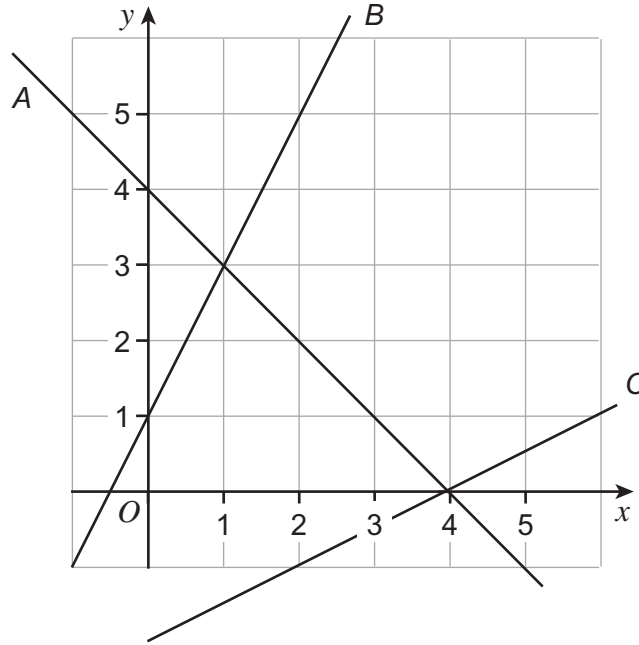
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Answer



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

Turn over ►



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]

.....
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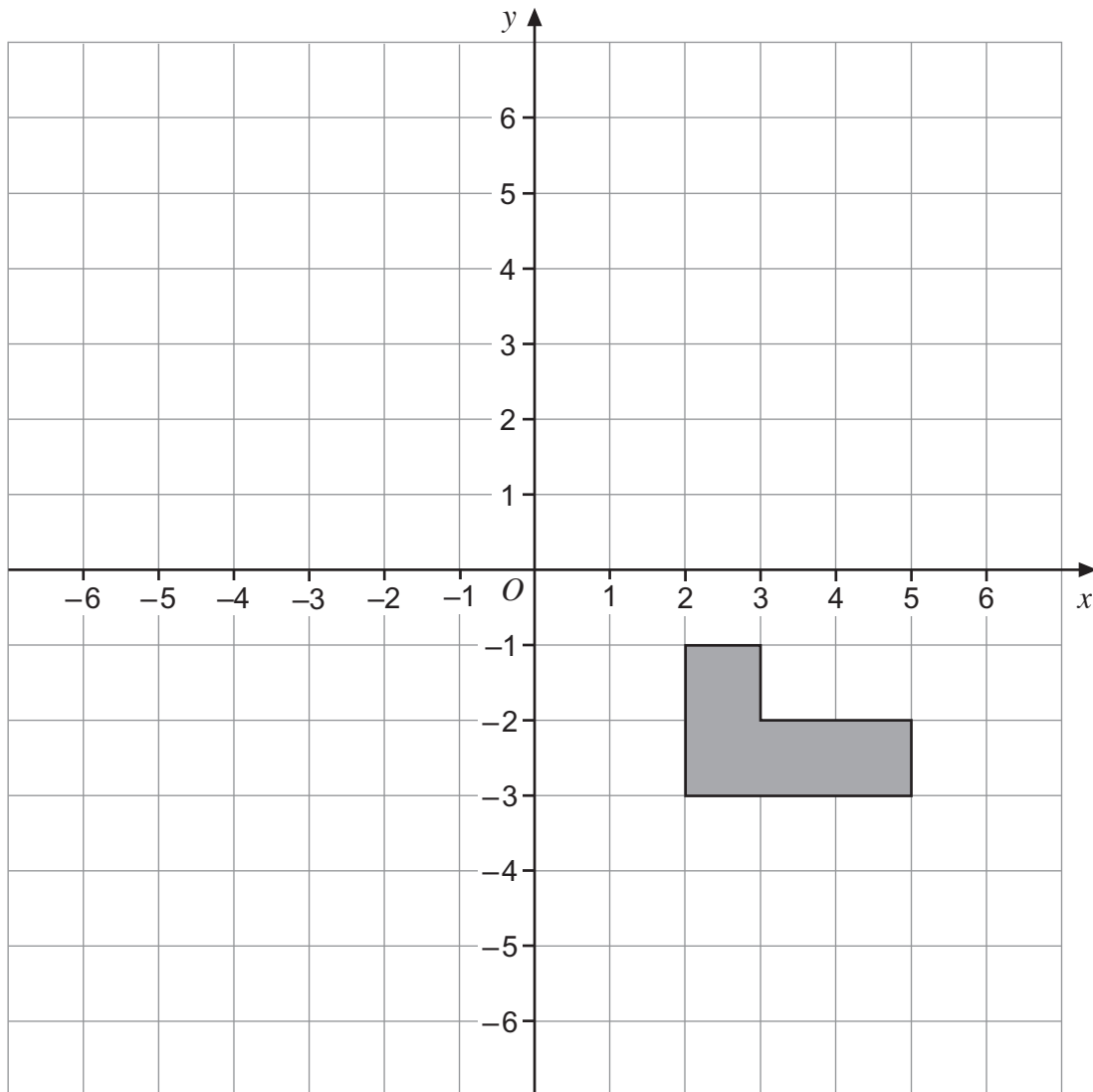
Answer

Turn over for the next question



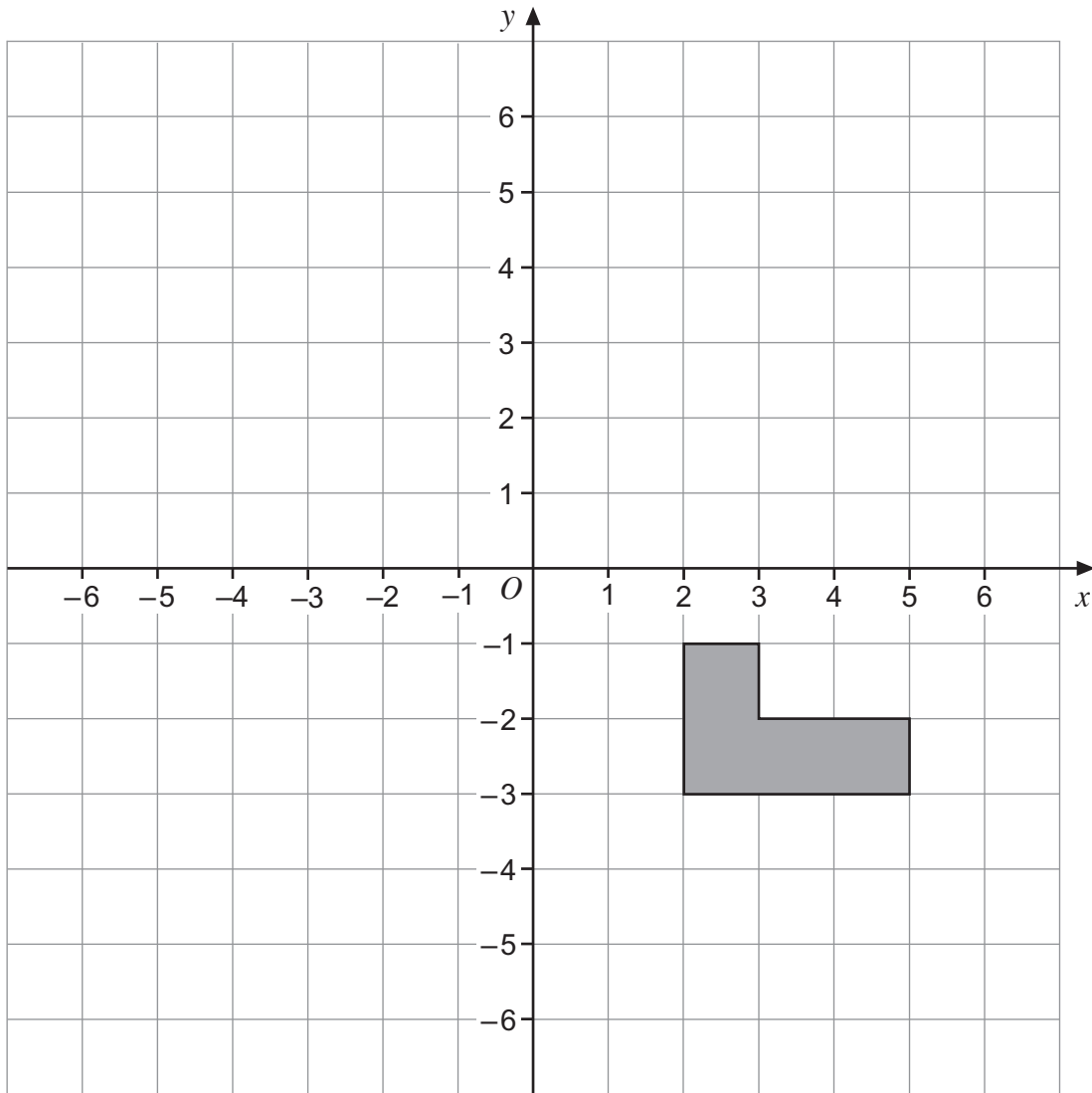
25 (a) Reflect the shape in the line $x = 2$

[2 marks]



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

[2 marks]



Turn over for the next question

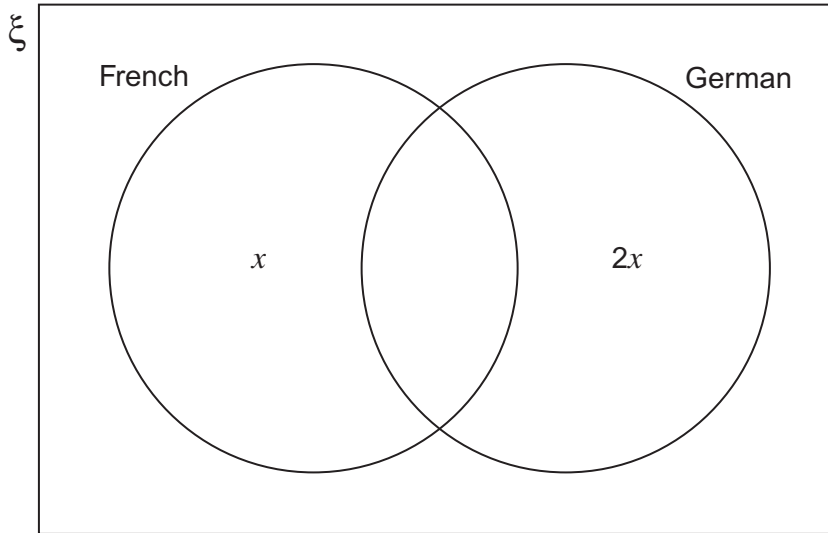


26 In a group of 30 students

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]

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.....

$x =$

END OF QUESTIONS

