

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS SYLLABUS A**

J512/01

Paper 1
(Foundation Tier)

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

**Monday 18 May 2009
Afternoon**

Duration: 2 hours



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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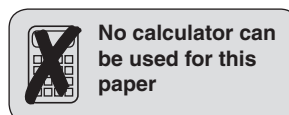
MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

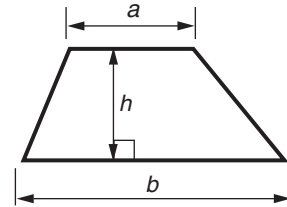
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **100**.
- This document consists of **20** pages. Any blank pages are indicated.

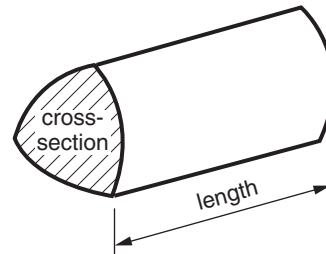


Formulae Sheet: Foundation Tier

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

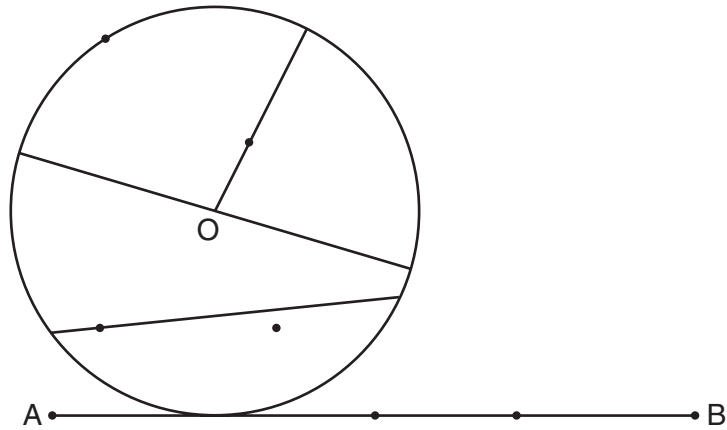


Volume of prism = (area of cross-section) \times length



PLEASE DO NOT WRITE ON THIS PAGE

- 1 The diagram shows a circle, centre O, and a line AB.



- (a) Measure the length of the line AB in centimetres.

(a) _____ cm [1]

- (b) Measure the diameter of the circle in centimetres.

(b) _____ cm [1]

There are some dots (•) on the diagram.

- (c) Write R by the dot on the radius of the circle. [1]

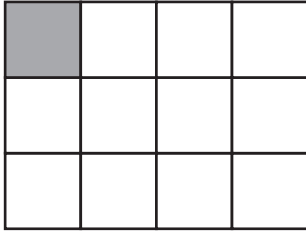
- (d) Write C by the dot on the circumference of the circle. [1]

- (e) Write M by the dot at the midpoint of the line AB. [1]

- (f) Draw a line parallel to AB. [1]

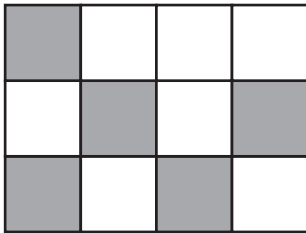
2 (a) What fraction of each shape is shaded?

(i)



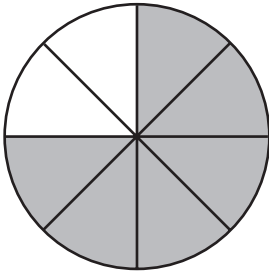
(a)(i) _____ [1]

(ii)



(ii) _____ [1]

(b) What fraction of this shape is shaded?
Write your answer in its simplest form.



(b) _____ [2]

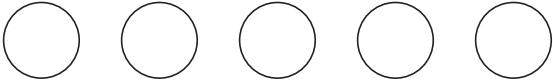
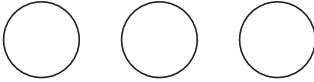
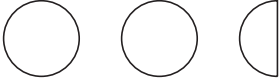
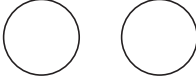
(c) Write down a fraction that is smaller than $\frac{1}{10}$.


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.....

(c) _____ [1]

3 Edmund did a survey to find out what sort of pizza people in his school preferred. He represented the results in a pictogram.

Pizza	Frequency
Cheese and tomato	
Pepperoni	
Pineapple	
Four Seasons	
Mushroom	

Key:  represents 4 people

(a) 6 people preferred Four Seasons.

Show this on the pictogram.

[1]

The pictogram is now complete.

(b) Which is the most popular sort of pizza?

(b) _____ [1]

(c) How many people chose Pepperoni?

(c) _____ [1]

(d) How many more people chose Pineapple than Mushroom?

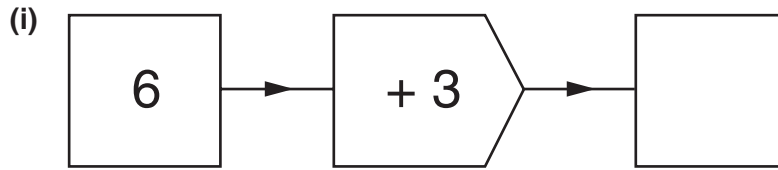
(d) _____ [1]

(e) How many people did Edmund ask altogether?

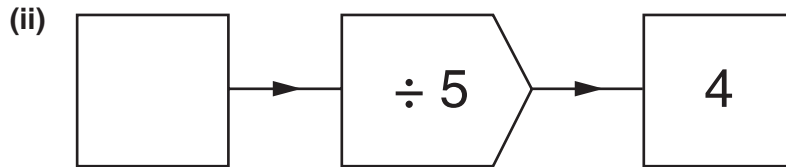
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(e) _____ [2]

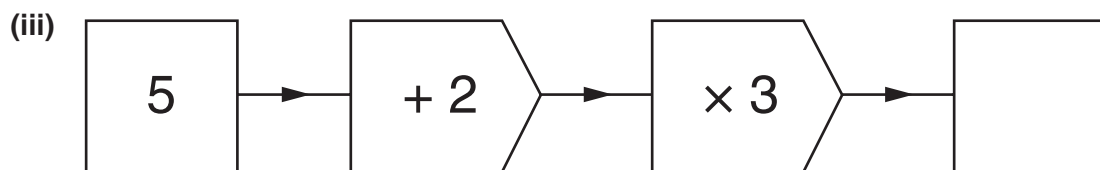
4 (a) Complete these number machine calculations by filling in the empty boxes.



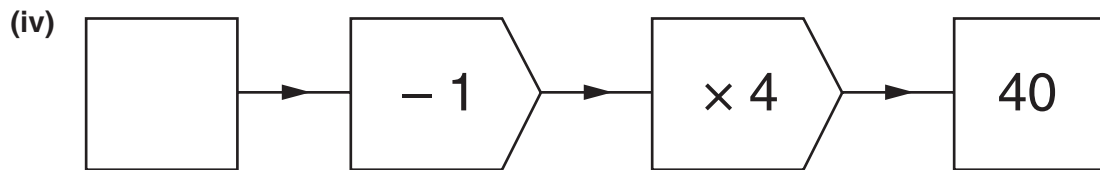
[1]



[1]



[2]



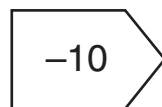
[2]

(b) Caroline uses this number machine.



She says that when the Input is 20, the Output will be 10.

Barney says the rule **must** be



.

Explain why Barney may be wrong.

[1]

5 (a) Work out.

(i) 32×100

(a)(i) _____ [1]

(ii) 160×10

(ii) _____ [1]

(iii) $27\,000 \div 10$

(iii) _____ [1]

(iv) $240 \div 100$

(iv) _____ [1]

(b) (i) Write 4766 correct to the nearest 100.

(b)(i) _____ [1]

(ii) Write 2981 correct to the nearest 10.

(ii) _____ [1]

6 Here is a list of scores.

4 4 4 4 5 5 5 6 6 10 11 11 14 19

For these scores, work out

(a) the range,

.....

(a) _____ [1]

(b) the median.

.....

(b) _____ [2]

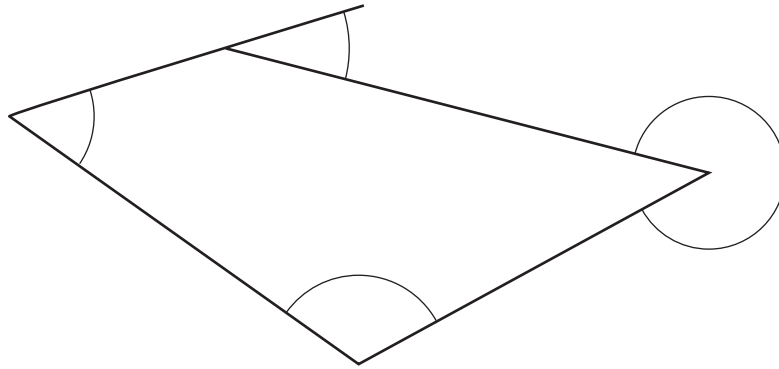
7 (a) In this diagram, four angles have been marked with arcs.

(i) One of the four angles is obtuse. Label it O.

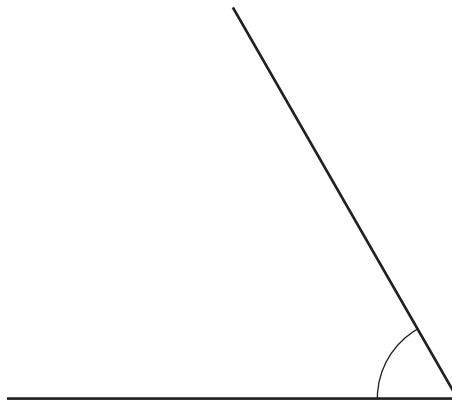
[1]

(ii) One of the four angles is reflex. Label it R.

[1]

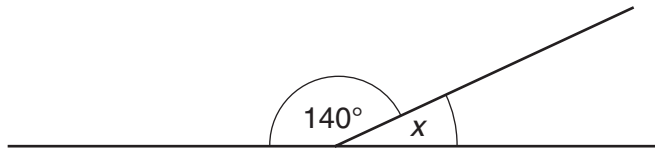


(b) Measure the size of the angle below.



(b) _____ ° [1]

- (c) (i) Work out the size of angle x .
Give a reason for your answer.

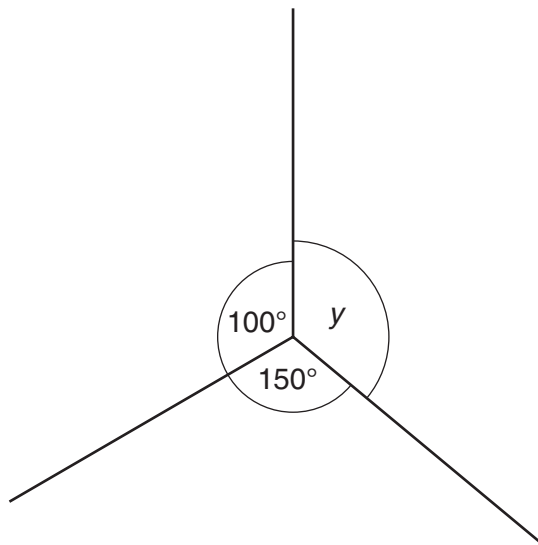


NOT TO
SCALE

.....

 $x =$ _____ $^{\circ}$ because _____
 _____ [2]

- (ii) Work out the size of angle y .
Give a reason for your answer.



NOT TO
SCALE

.....

 $y =$ _____ $^{\circ}$ because _____
 _____ [2]

8 Ruth is raising money for charity.
She buys candy canes and sells them at a higher price.

(a) Ruth buys 35 candy canes for 50p each.

How much change should she get from a £20 note?

.....

.....

.....

.....

(a) £ _____ [3]

(b) She makes 30% profit on each candy cane.

Find 30% of 50p.

.....

.....

.....

(b) _____ p [2]

9 (a) Simplify.

(i) $5y + 2y$

(a)(i) _____ [1]

(ii) $4w + 3z - 2w + z$

.....

(ii) _____ [2]

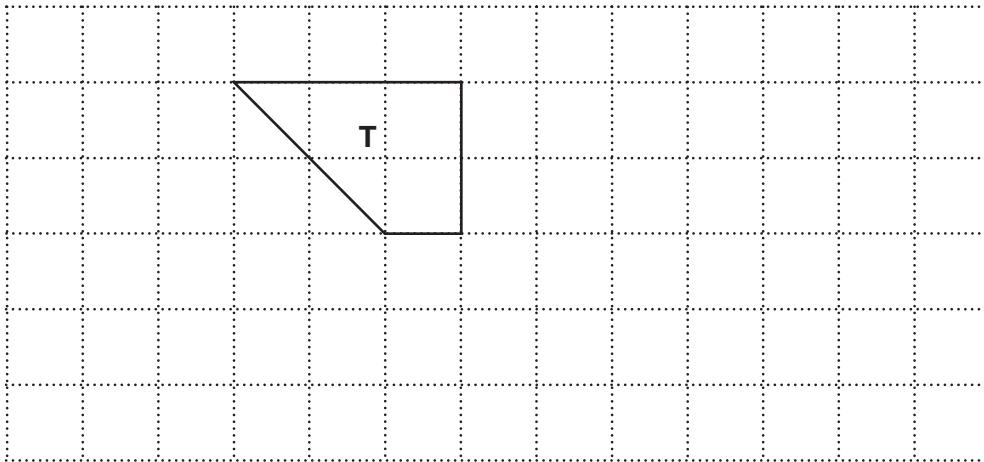
(b) Work out the value of $2j + 5k$ when $j = 7$ and $k = 3$.

.....

.....

(b) _____ [2]

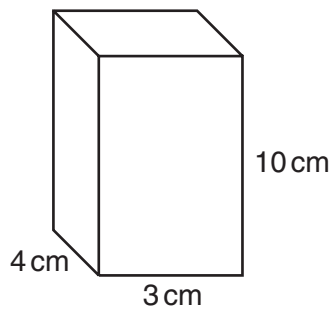
10 (a) Shape **T** is drawn on a centimetre grid.



Show how shape **T** will tessellate. Draw at least 7 more shapes.

[2]

(b) (i) Work out the volume of this cuboid.
Give the units of your answer.



.....

(b)(i) _____ [3]

(ii) Write down the dimensions of a **different** cuboid that has the same volume as the one in part (b)(i).

.....

Length _____ cm, Width _____ cm, Height _____ cm [1]

11 Work out.

(a) 7^2

.....
(a) _____ [1]

(b) $2^4 + \sqrt{100}$

.....
(b) _____ [2]

(c) $5.5 - 2.22$

.....
.....
(c) _____ [1]

(d) $\frac{5}{6}$ of 78

.....
.....
(d) _____ [2]

- 12 Mr Smith did a survey of how students travelled to school.
The table shows some of the results.

Complete the table.

.....

.....

.....

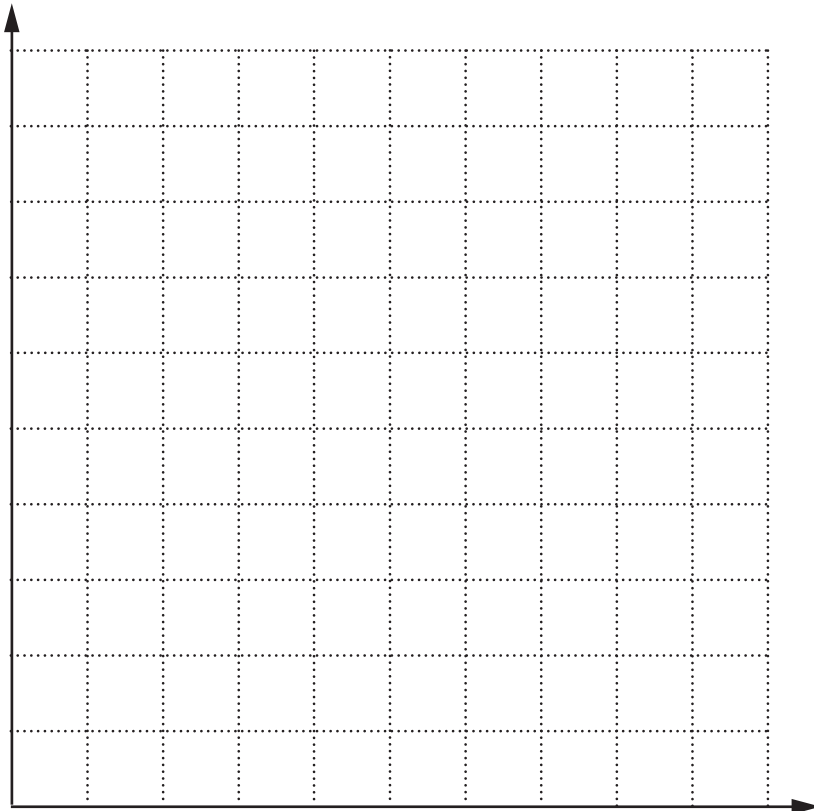
	Bus	Walk	Car	Total
Boys	21		13	57
Girls		8		
Total	40			100

[3]

- 13 The table shows the distribution of waiting times (in minutes) that customers spent at the checkout of a supermarket.

Waiting time (minutes)	Frequency
0 up to 2	8
2 up to 4	19
4 up to 6	11
6 up to 8	6
8 up to 10	3

- (a) Draw a grouped frequency diagram to show this information. Show your scales and label your axes clearly.



[3]

(b) Write down the modal class for these waiting times.

(b) _____ minutes [1]

(c) One of these customers is chosen at random.

What is the probability that this customer waited 6 minutes or more?

.....
.....

(c) _____ [2]

14 (a) The probability that Nouri wins a tennis match is 0.47.

What is the probability that he does not win the match?
Give a reason for your answer.

.....
.....

_____ because _____
_____ [2]

(b) Sam is told that the probability that his football team will win on Saturday is 0.7.
Lizzie says "This means the probability the team will **lose** on Saturday is 0.3."

Explain why Lizzie may be wrong.

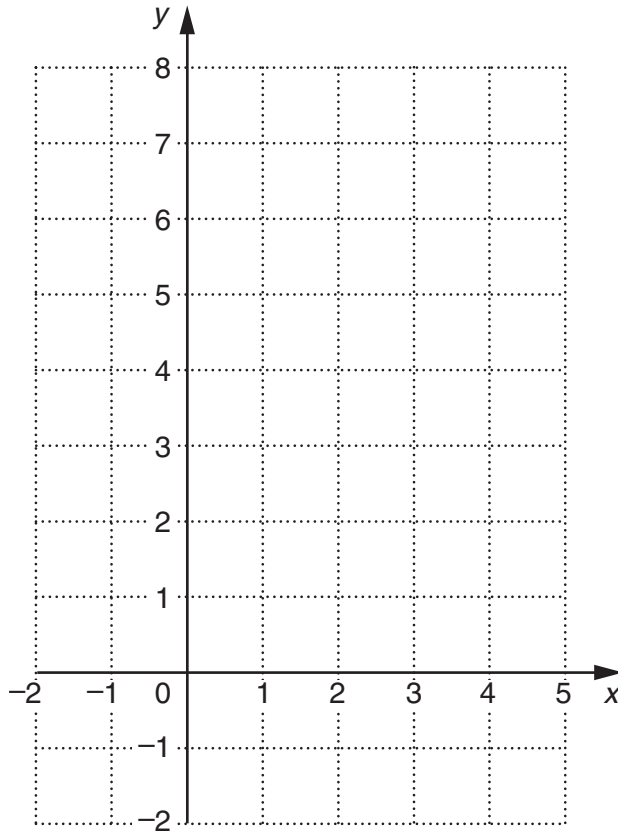
_____ [1]

15 (a) Complete this table for $y = 2x + 2$.

x	-2	-1	0	1	2	3
y	-2		2	4		

[1]

(b) On the grid, draw the graph of $y = 2x + 2$ for values of x from -2 to 3 .



[2]

(c) On the grid, draw the graph of $y = 5$.

[1]

16 (a) Solve.

$$6y - 1 = 29$$

.....
.....

(a) _____ [2]

(b) Show that $x = 2$ is the solution of this equation.

$$9x - 1 = 4x + 9$$

_____ [2]

(c) Solve.

$$\frac{x}{2} - 3 = 5$$

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

(c) _____ [2]

17 (a) In a carton of *Squashy*, orange juice and water are mixed in the ratio 3 : 7.

How many litres of orange juice are needed to make 60 litres of *Squashy*?

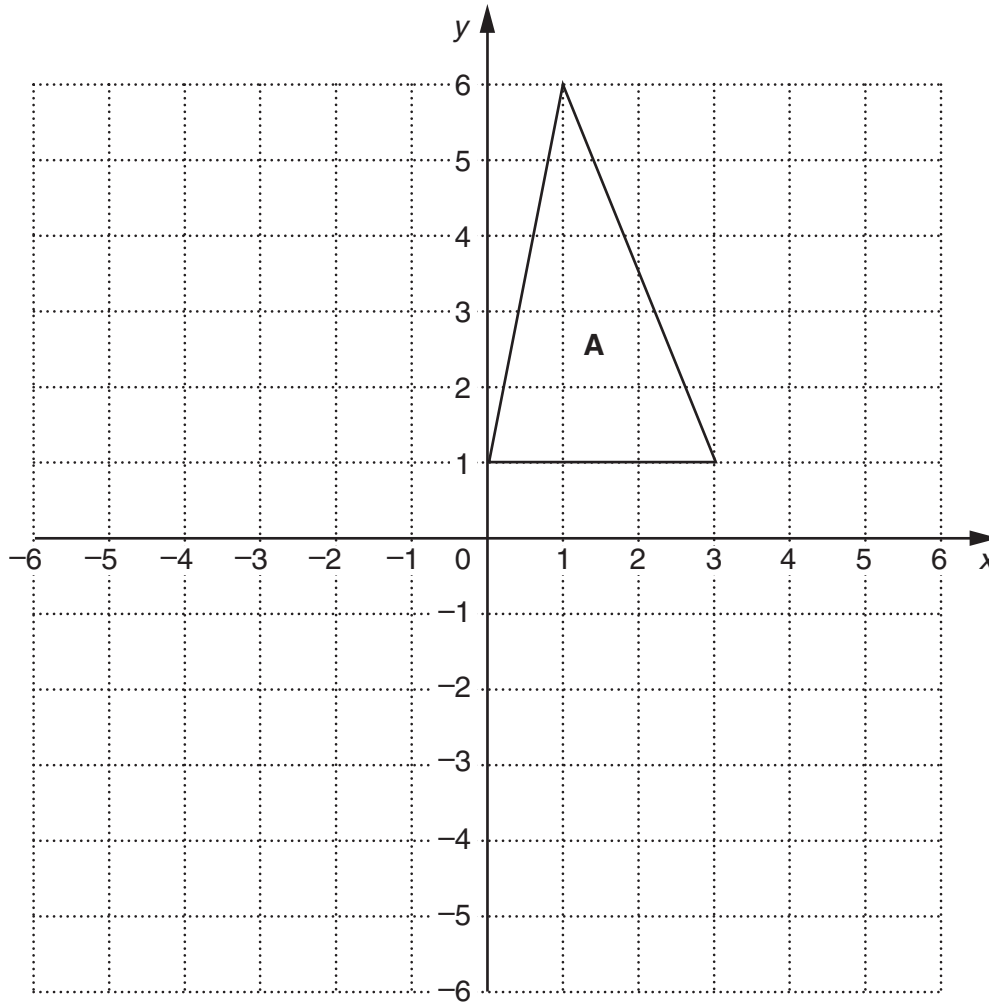
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(a) _____ litres [2]

(b) One carton contains 150 ml of *Squashy*, correct to the nearest millilitre.

What is the least possible amount of *Squashy* that could be in the carton?

(b) _____ ml [1]



(a) Triangle **A** is drawn on a 1 cm square grid.

Work out the area of triangle **A**.

.....

.....

.....

(a) _____ cm² [2]

(b) Reflect triangle **A** in the line $x = 3$.
Label the image **P**.

[2]

(c) Rotate triangle **A** 90° clockwise about (0,0).
Label the image **Q**.

[3]

TURN OVER FOR QUESTION 19

19 As a product of prime factors,

$$24 = 2 \times 2 \times 2 \times 3.$$

(a) Write 40 as a product of prime factors.

.....
.....

(a) _____ [2]

(b) (i) Work out the highest common factor (HCF) of 24 and 40.

.....
.....

(b)(i) _____ [2]

(ii) Work out the least common multiple (LCM) of 24 and 40.

.....
.....

(ii) _____ [2]



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