OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS SYLLABUS A

J512/01

Paper 1
(Foundation Tier)

CUP/T66430

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

J512/01

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

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.

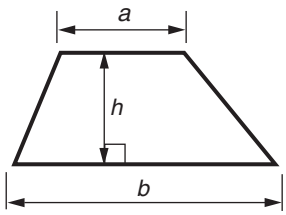
INFORMATION FOR CANDIDATES

- 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.

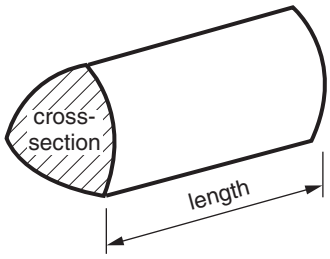
No calculator can be used for this paper

Formulae Sheet: Foundation Tier

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

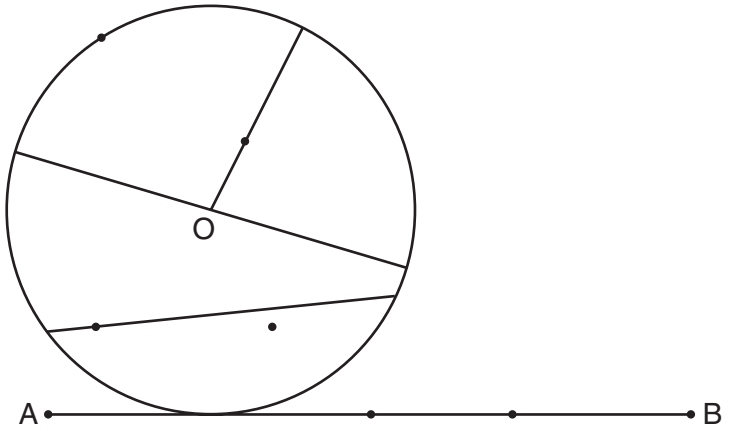


Volume of prism = (area of cross-section) × length



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]**

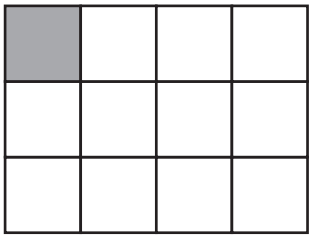
(d) Write C by the dot on the circumference of the circle. **[1]**

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

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

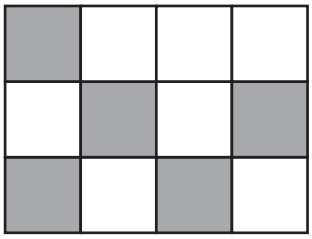
2 **(a)** What fraction of each shape is shaded?

(i)



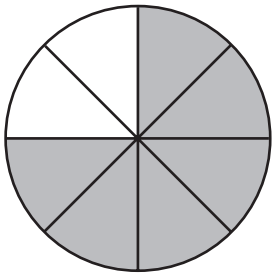
(a)(i) _____ **[1]**

(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 $\frac{1}{10}$.

.....

.....

(c) _____ **[1]**

3 Edmund did a survey to find out what type 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 type of pizza?

(b) _____ **[1]**

(c) How many people chose Pepperoni?

(c) _____ **[1]**

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

(d) _____ **[1]**

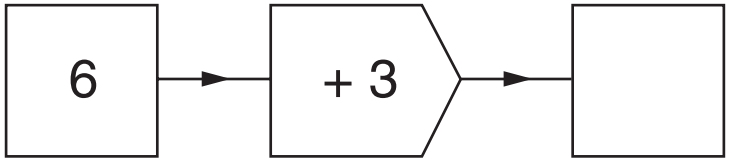
(e) How many people did Edmund ask altogether?

.....

(e) _____ **[2]**

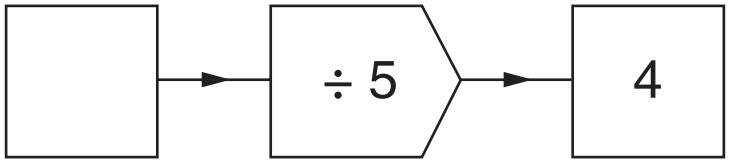
4 **(a)** Complete these number machine calculations by filling in the empty boxes.

(i)



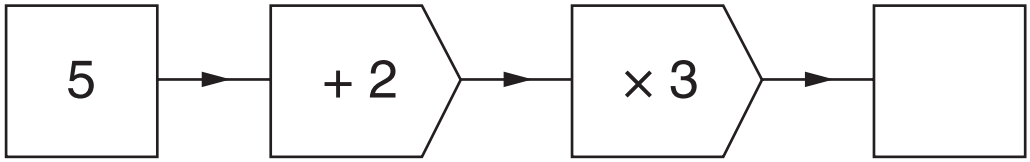
[1]

(ii)



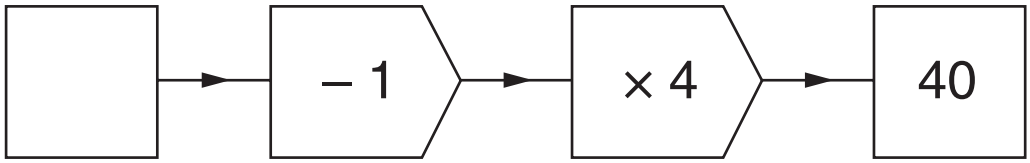
[1]

(iii)



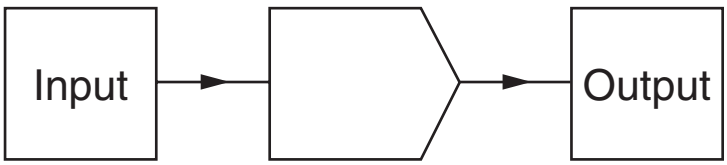
[2]

(iv)

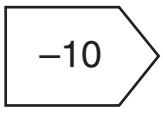


[2]

(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.

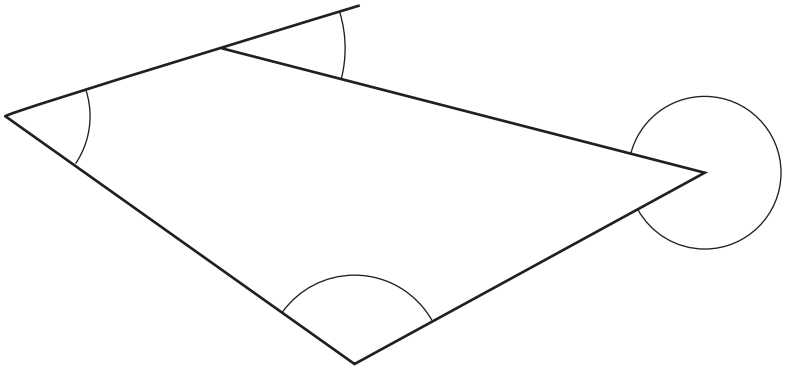
.....

(b) _____ **[2]**

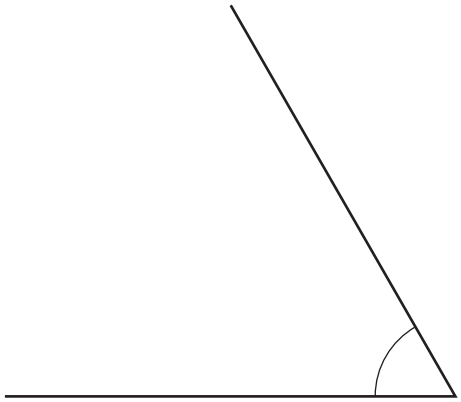
7 **(a)** In this diagram, four angles have been marked with arcs.

(i) One of the four angles is obtuse. Label it O. **[1]**

(ii) One of the four angles is reflex. Label it R. **[1]**

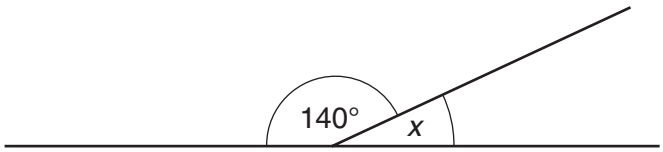


(b) Measure the size of the angle below.



(b) _____ ° **[1]**

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



NOT TO SCALE

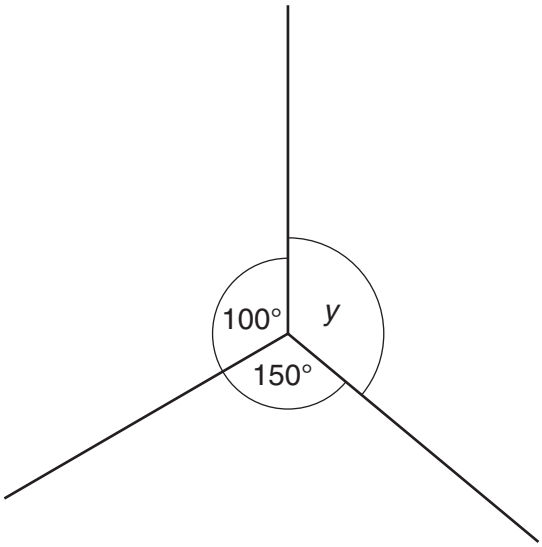
.....

.....

$x =$ _____° because _____

_____ **[2]**

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



NOT TO SCALE

.....

.....

$y =$ _____° 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]**

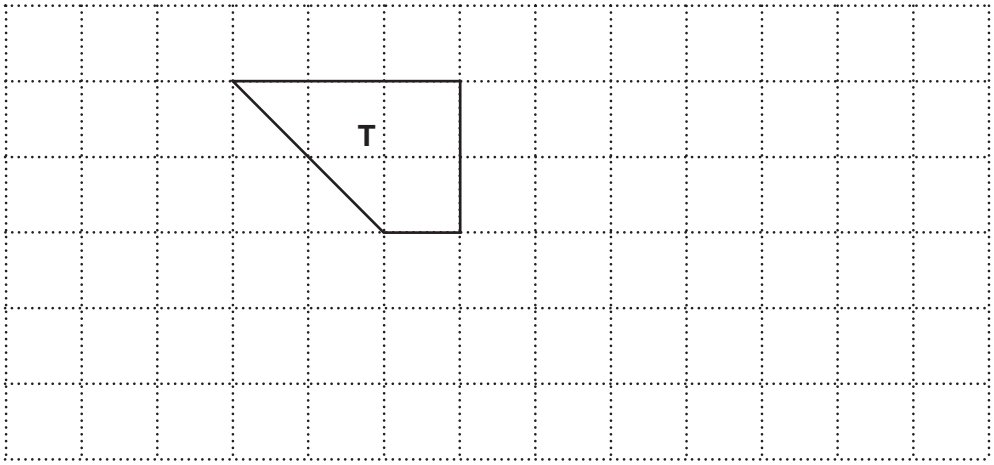
(b) Work out the value of $2j + 5k$ when $j = 7$ and $k = 3$.

.....

.....

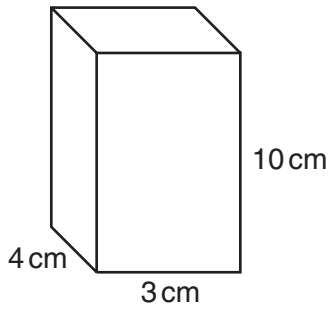
(b) _____ **[2]**

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.
He displayed his results in a table.

Complete the table.

.....

.....

.....

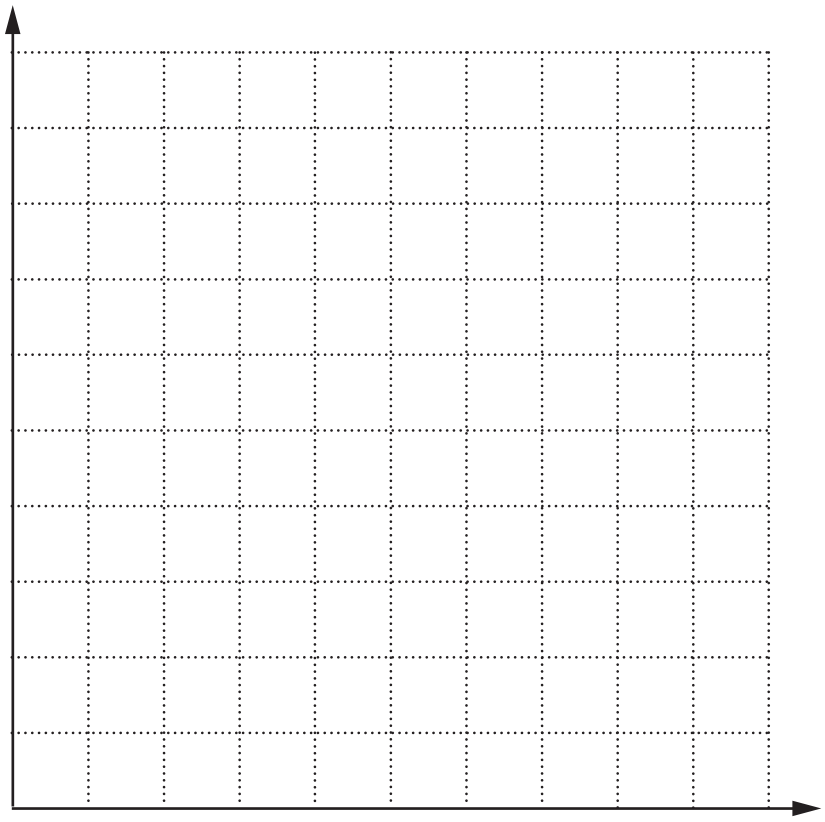
	Bus	Walk	Car	Total
Boys	21		13	57
Girls		8		
Total	40			100

[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.

_____

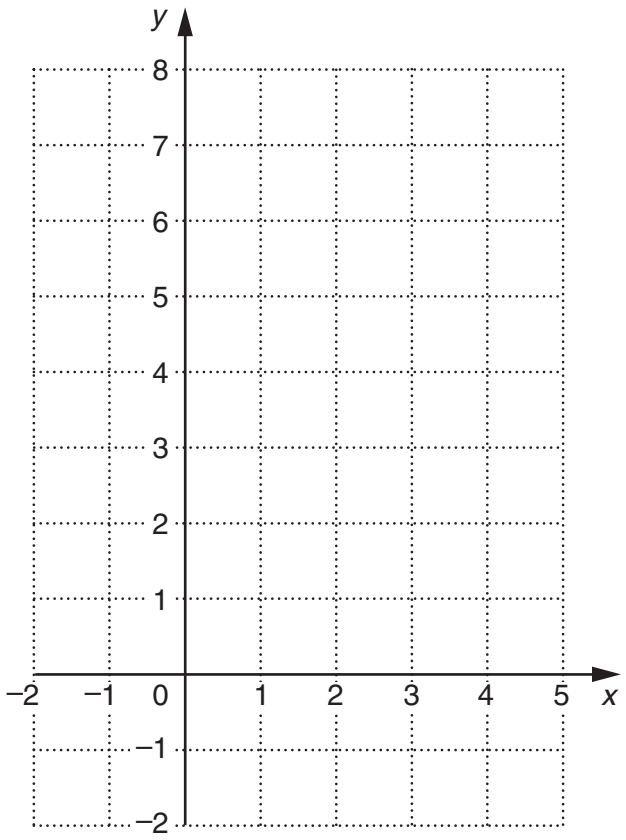
_____ **[1]**

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*?

.....

.....

.....

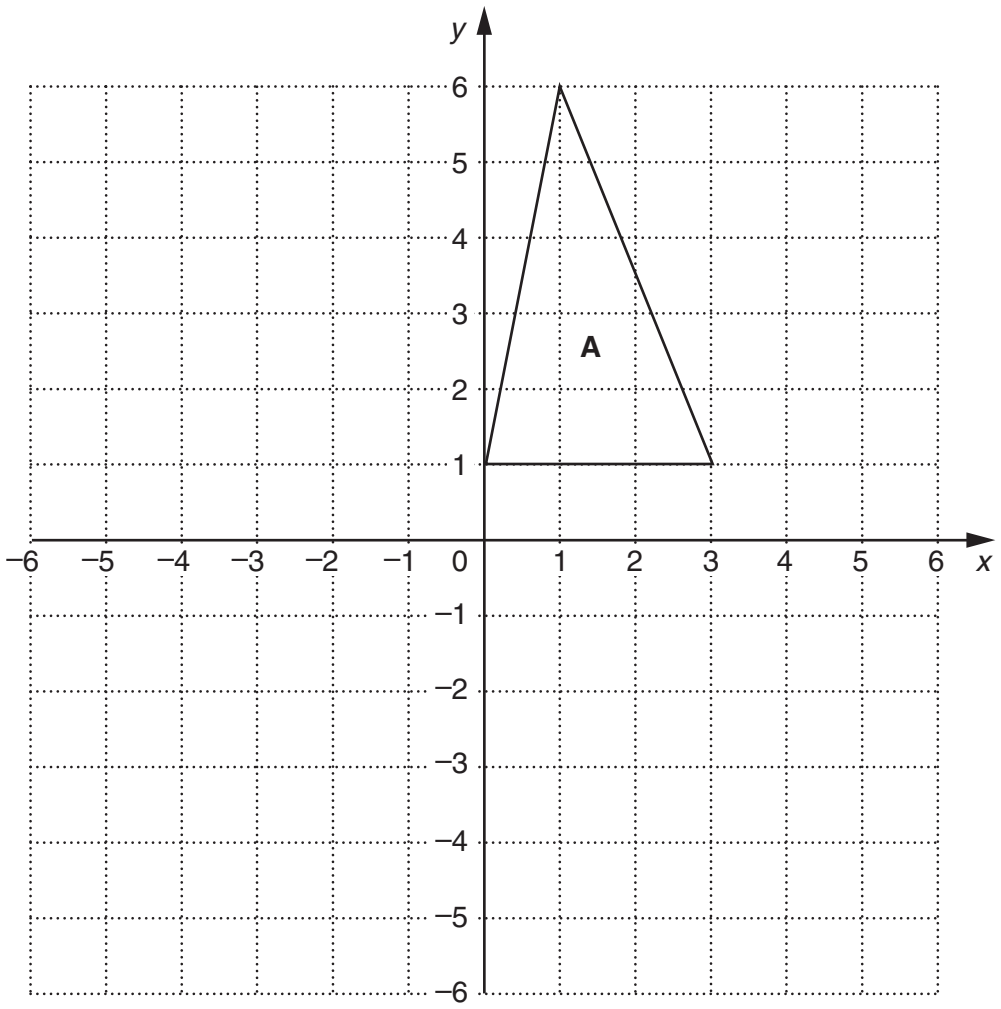
(a) _____ litres **[2]**

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

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

(b) _____ ml **[1]**

18



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

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

.....

.....

.....

(a) _____ cm^2 **[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]**