OCR
RECOGNISING ACHIEVEMENT

**F**

# Thursday 20 June 2013 – Morning

## GCSE METHODS IN MATHEMATICS

**B392/01** Methods in Mathematics 2 (Foundation Tier)

*B317090613*

Candidates answer on the Question Paper.

**OCR supplied materials:**
None

**Other materials required:**
- Scientific or graphical calculator
- Geometrical instruments
- Tracing paper (optional)

**Duration:** 1 hour 30 minutes

*B 3 9 2 0 1*

| Candidate forename | | Candidate surname | |
|---|---|---|---|

| Centre number | | | | | | Candidate number | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

**INSTRUCTIONS TO CANDIDATES**

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

**INFORMATION FOR CANDIDATES**

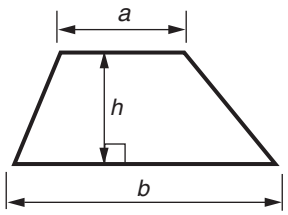
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **90**.
- This document consists of **20** pages. Any blank pages are indicated.

**You are permitted to use a calculator for this paper**

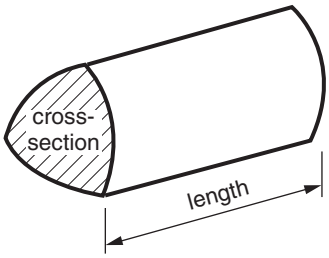
This paper has been pre modified for carrier language

## 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** These are four number cards.

| 3 | 4 | 6 | 7 |
|---|---|---|---|

**(a)** Write the number 3467 in words.

_____ **[1]**

**(b)** Arrange the cards to make the largest possible even number.

| | | | |
|---|---|---|---|

**[1]**

**(c)** Arrange the cards in this subtraction to make the largest possible answer.

| | | | | | |
|---|---|---|---|---|---|
| | | − | | = | _____ |

**[1]**

**(d)** Arrange the cards in this multiplication to make the largest possible answer.

| | | | | | |
|---|---|---|---|---|---|
| | | × | | = | _____ |

**[2]**

**2** Calculate.

**(a)** $\dfrac{85.1 - 14.6}{7.5}$

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

**(b)** $\sqrt{961}$

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

**(c)** $18^3$

**(c)** _____ **[1]**

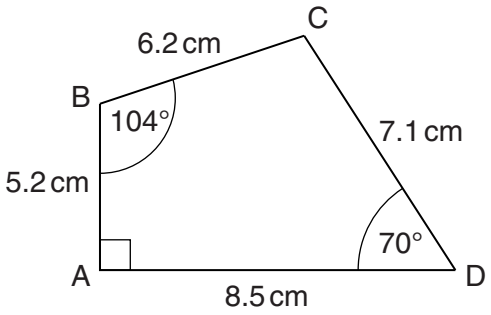
**3** The table shows the ingredients for spicy apple crumble for 4 people.

Complete the table to show the ingredients for 12 people.

| Ingredient | Amount for 4 people | Amount for 12 people |
|---|---|---|
| Apples | 1 kg | _____ kg |
| Mixed spice | ½ teaspoon | _____ teaspoons |
| Sultanas | 100 g | _____ g |
| Flour | 180 g | _____ g |
| Butter | 75 g | _____ g |
| Brown sugar | 75 g | _____ g |

**[3]**

**4** ABCD is a quadrilateral.




**Not to scale**

**(a)** Write down the size of angle BAD.

**(a)** _____ ° **[1]**

**(b)** Work out the size of angle BCD.

**(b)** _____ ° **[2]**

**(c)** Work out the perimeter of the quadrilateral.

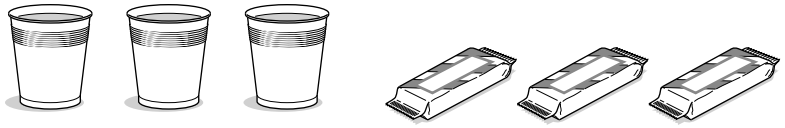
**(c)** _____ cm **[2]**

**(d)** Quadrilateral ABCD is enlarged using scale factor 5.

Work out the perimeter of the enlarged quadrilateral.

**(d)** _____ cm **[1]**

**5** Alan buys 3 orange drinks and 3 flapjack bars in a cafe.



The bill for Alan's orange drinks and flapjack bars is £3.30.

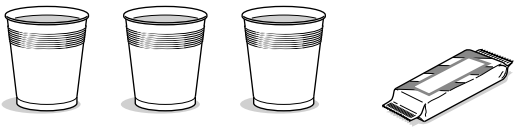
**(a)** Alan pays with a £5 note.
He is given the correct change in four coins.

Work out two possible sets of values for the four coins.

**(a)** _____ _____ _____ _____

_____ _____ _____ _____ **[3]**

**(b)** Cara buys 3 orange drinks and 1 flapjack bar in the same cafe.



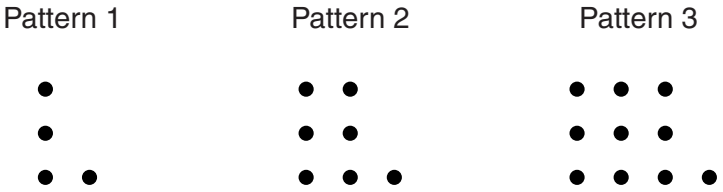
The bill for Cara's orange drinks and flapjack bar is £2.50.

Use the information about Alan's and Cara's bills to work out the cost of one orange drink and the cost of one flapjack bar.

**(b)** orange drink _____ p

flapjack bar _____ p **[3]**

**6** **(a)** The diagram shows the first three patterns in a sequence of dot patterns.




**(i)** Complete this table for the first four patterns in the sequence.

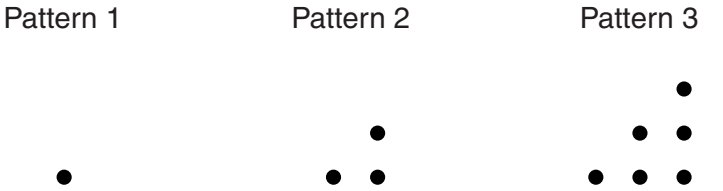
| **Pattern number** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Number of dots** | | | | |

**[3]**

**(ii)** Work out the number of dots in the 10th pattern.

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

**(b)*** This diagram shows the first three patterns in a different sequence of dot patterns.




Work out the number of dots in the 7th pattern.

Describe how you worked out your answer.

_____

_____

_____ **[3]**

**7** Write these fractions in decimal form.

**(a)** $\frac{7}{100}$

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

**(b)** $\frac{9}{20}$

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

**(c)** $\frac{2}{3}$

**(c)** _____ **[1]**

**8** Work out.

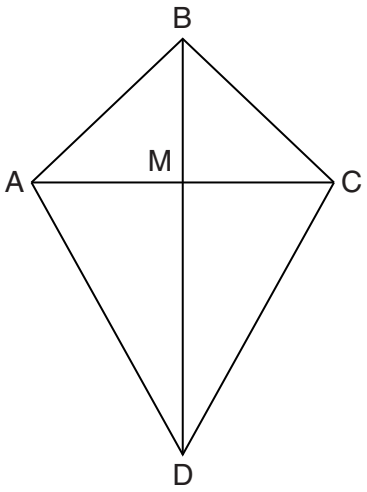
**(a)** 25% of £84

**(a)** £ _____ **[2]**

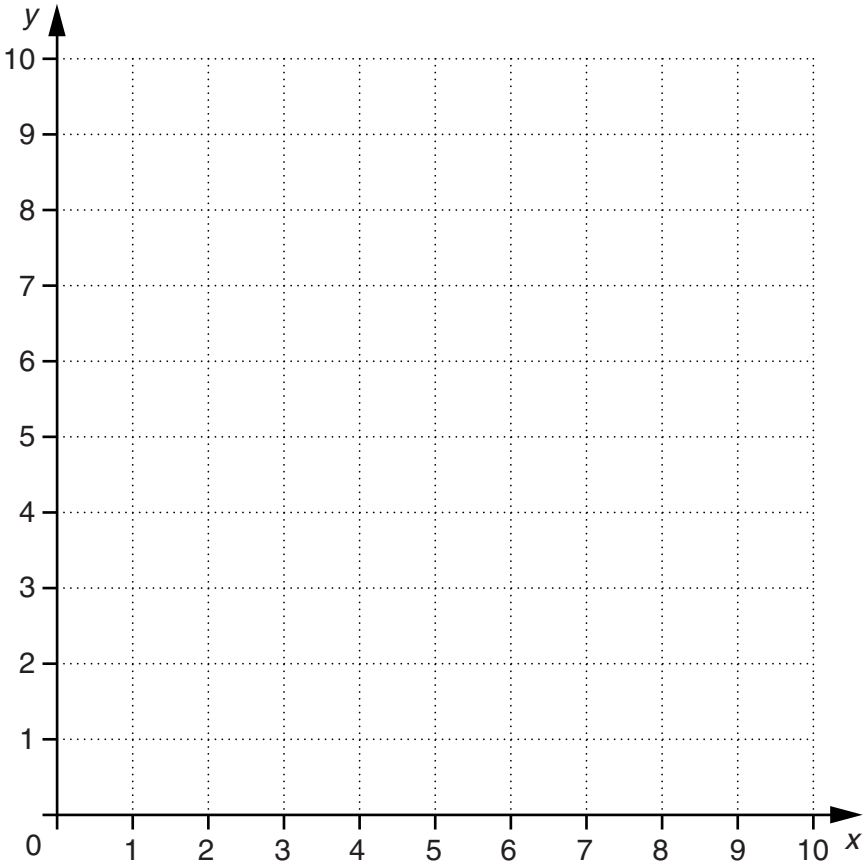
**(b)** 35% of £124

**(b)** £ _____ **[2]**

**9** This is a sketch of a kite ABCD.
The diagonals of the kite intersect at M.




**Not to scale**




**(a)** The coordinates of A are (2, 7), the coordinates of B are (5, 9) and the coordinates of C are (8, 7).

On the grid plot the points A, B and C. **[2]**

**(b)** What is the mathematical name for triangle ABC?

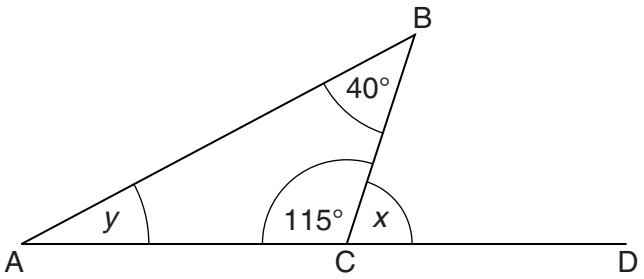
**(b)** _____ **[1]**

**(c)** The ratio of length BM to length MD is 1 : 3.

Work out the coordinates of D.

**(c)** (_____, _____) **[2]**

**10** **(a)** ABC is a triangle.
ACD is a straight line.



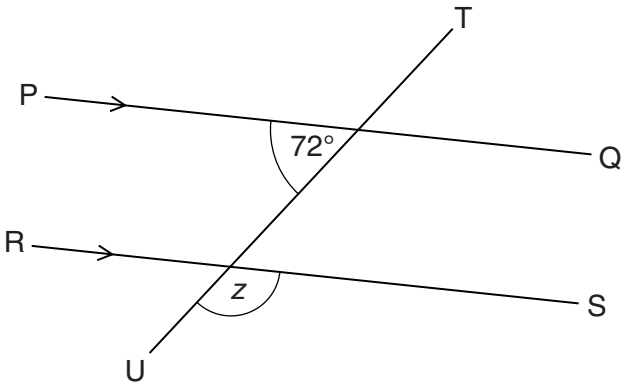

**Not to scale**

Find the sizes of angle *x* and angle *y*.

**(a)** $x =$ _____ ° **[1]**

$y =$ _____ ° **[2]**

**(b)** The straight line TU intersects the parallel lines PQ and RS.

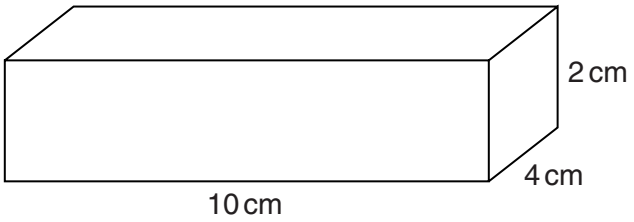



**Not to scale**

Find the size of angle *z*.

**(b)** $z =$ _____ ° **[2]**

**11** Amir has some one-centimetre cubes. He uses the cubes to make a cuboid.

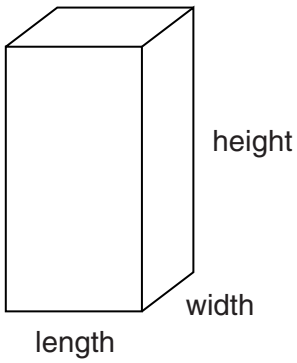



**(a)** Work out the number of cubes Amir uses.

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

**(b)** Amir then uses the cubes to make a new cuboid.

- he uses all the cubes
- the cuboid has a **square** base




**(i)** Work out one set of possible dimensions for his new cuboid.

**(b)(i)** length _____ cm, width _____ cm, height _____ cm **[2]**

**(ii)** Work out a different set of possible dimensions for his new cuboid.

**(ii)** length _____ cm, width _____ cm, height _____ cm **[1]**

**12** **(a)** Solve.

**(i)** $x + 19 = 32$

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

**(ii)** $\frac{x}{8} = 5$

**(ii)** _____ **[1]**

**(iii)** $9x - 11 = 2(x + 5)$

**(iii)** _____ **[3]**

**(b)** Craig says "$(5x)^2$ is bigger than $5x^2$".

Is Craig's statement **always** true, **sometimes** true or **never** true?

Complete the sentence below, explaining your decision fully.

Craig's statement is _____ true because _____

_____

_____ **[2]**

**13** Three families decide to rent a large holiday home.
They decide to share the cost in the ratio of the number of people in each family.

| | |
|---|---|
| Knight family | 5 people |
| Lakir family | 3 people |
| McCarthy family | 4 people |

The holiday home costs £3600 to rent for a fortnight.

Work out how much each family pays.

Knight family £ _____

Lakir family £ _____

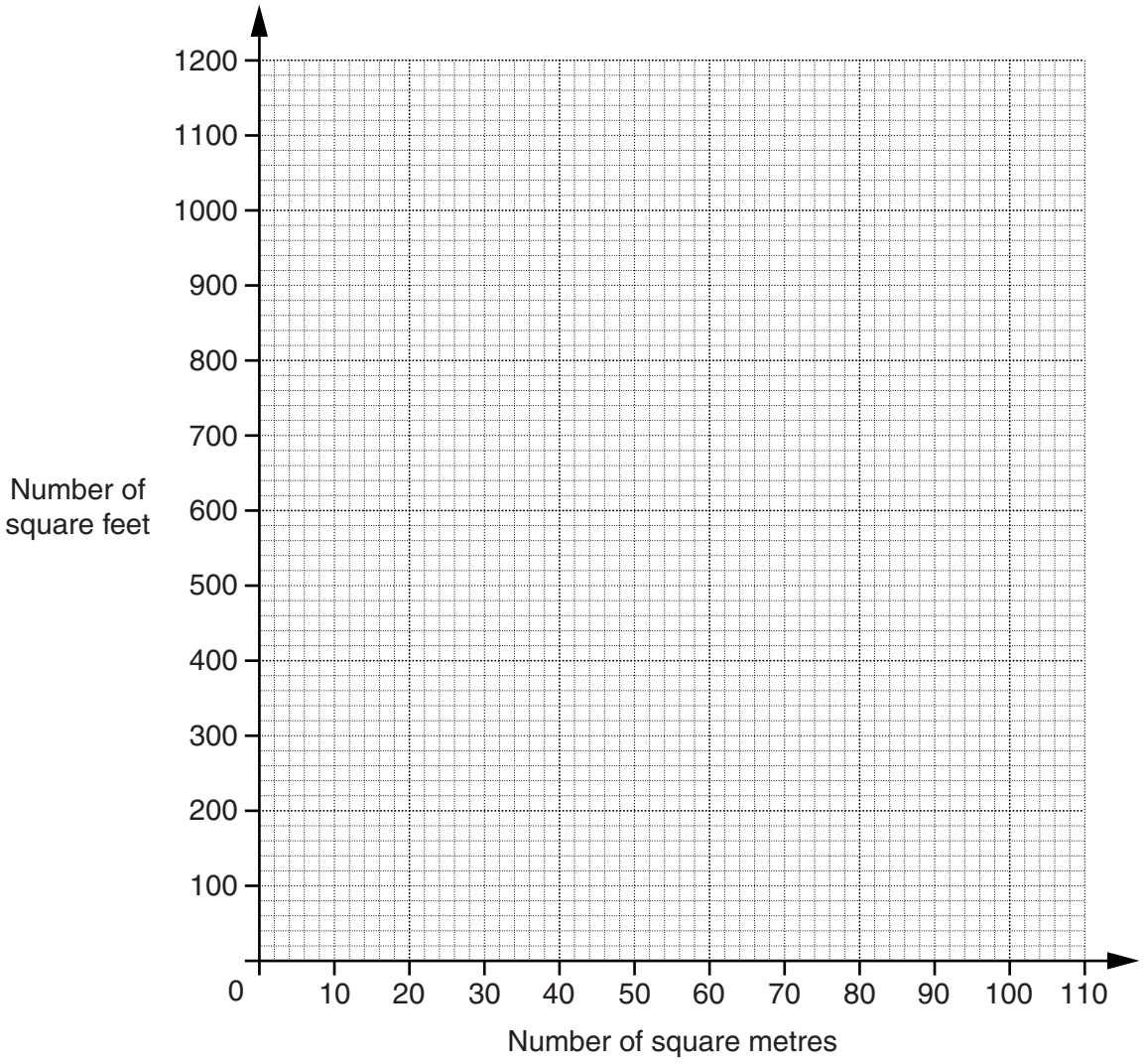
McCarthy family £ _____ **[3]**

**14** The charge for renting an office depends on the floor area.
Some adverts give the cost per square metre ($m^2$) and some give the cost per square foot ($ft^2$).

**(a)** This table shows the approximate conversion between square metres and square feet.

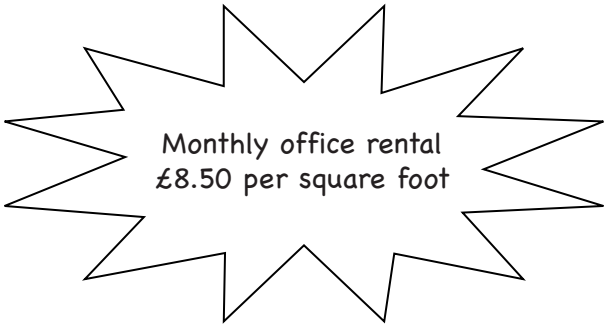
| **Number of square metres** | 20 | 40 | 60 | 100 |
|---|---|---|---|---|
| **Number of square feet** | 215 | 430 | 645 | 1075 |

Draw a graph for converting between square metres and square feet.

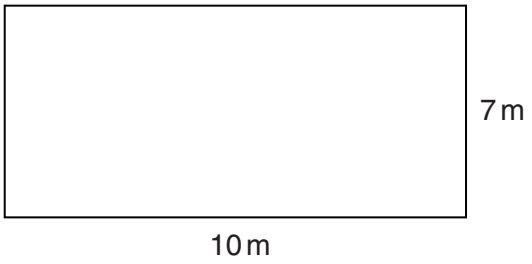



**[2]**

**(b)** This is an advert for renting offices.




This is the floor plan of one office.




**Not to scale**

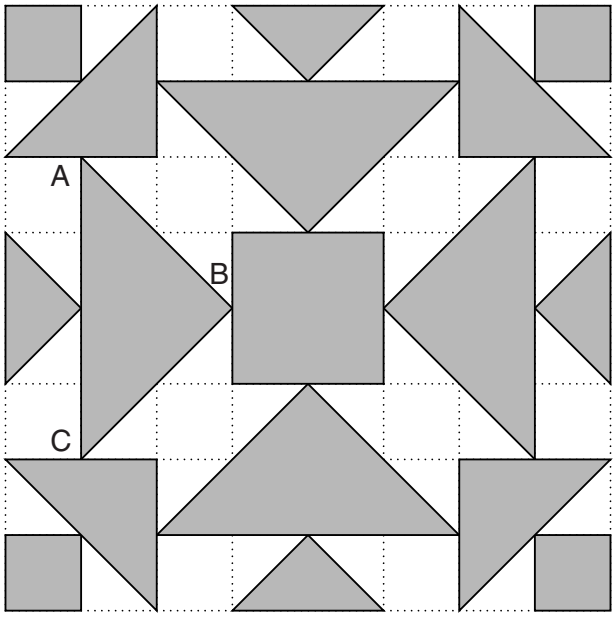
**(i)** Work out the area of this office.

**(b)(i)** _____ $m^2$ **[1]**

**(ii)*** Work out the cost of renting this office for one month.

**(ii)** £ _____ **[3]**

**15** This design is drawn on a one-centimetre square grid.




**(a)** In the design, how many **other** triangles are congruent to triangle ABC?
Do not count triangle ABC as one of them.

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

**(b)** Work out the percentage of the design that is shaded.

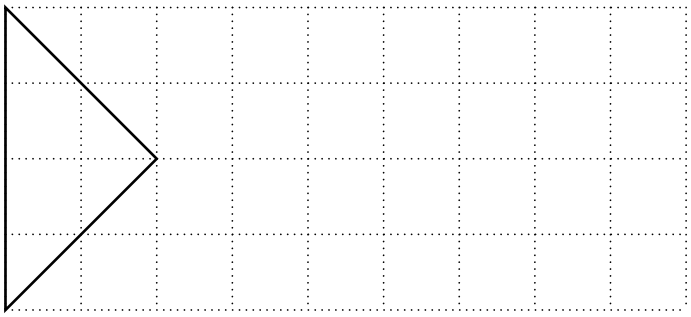
**(b)** _____ % **[4]**

**(c)** Calculate the length AB. Give your answer correct to two decimal places.

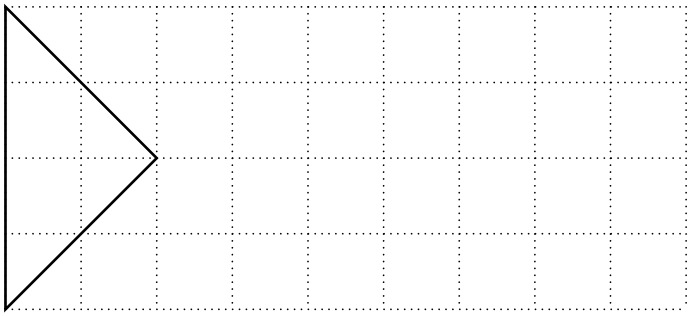
**(c)** _____ cm **[4]**

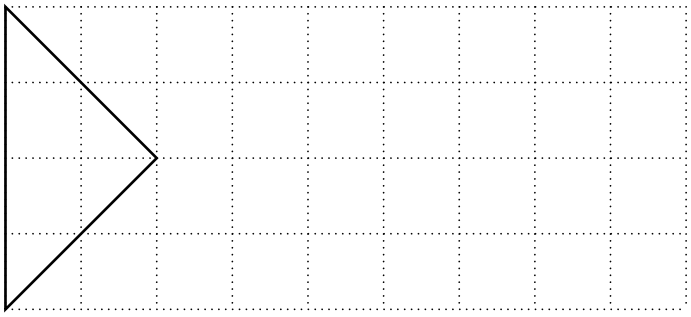
**(d)** Sameera can fit **all** the shaded shapes from the design into this rectangle.
The shapes do not overlap. There are no gaps between the shapes.

Show how the shapes fit in this rectangle. Triangle ABC has been drawn in already.



You can use the grids below for your rough work.





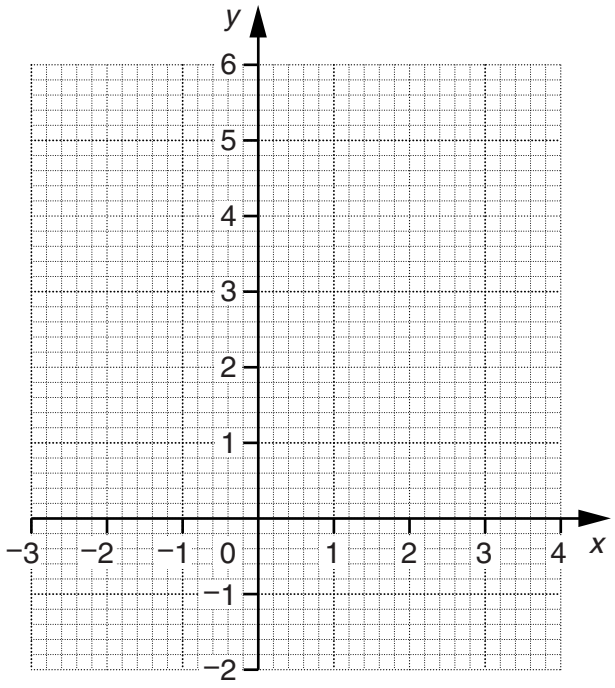
**[3]**

**16** **(a)** Complete the table for $y = x^2 - x - 1$.

| $x$ | $-2$ | $-1$ | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|
| $y$ | 5 | | $-1$ | | | |

**[2]**

**(b)** Draw the graph of $y = x^2 - x - 1$.




**[2]**

**(c)** Use your graph to solve the equation $x^2 - x - 1 = 0$.
Give your answers correct to 1 decimal place.

**(c)** _____ **[2]**

**17** The table shows some sets of positive integers which sum to 8, and the product of each set.

| The sum is 8 | Product |
|---|---|
| 6 + 2 | 6 × 2 = 12 |
| 4 + 3 + 1 | 4 × 3 × 1 = 12 |
| 2 + 1 + 5 | 2 × 1 × 5 = 10 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Find the maximum possible product for a set of positive integers which sum to 8.
Show your trials in the table. You may not need to use all the lines.

The maximum product is _____ **[3]**

**END OF QUESTION PAPER**

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