



# Cambridge IGCSE™

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**MATHEMATICS**

**0580/32**

Paper 3 (Core)

**May/June 2023**

**2 hours**

You must answer on the question paper.

You will need: Geometrical instruments

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You should use a calculator where appropriate.
- You may use tracing paper.
- You must show all necessary working clearly.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.
- For  $\pi$ , use either your calculator value or 3.142.

## INFORMATION

- The total mark for this paper is 104.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **20** pages. Any blank pages are indicated.

- 1 (a) Write the number three hundred thousand and three in figures.

..... [1]

- (b) Write 15 896 correct to

- (i) the nearest thousand

..... [1]

- (ii) the nearest ten.

..... [1]

- (c) By writing each number in the calculation correct to 1 significant figure, work out an estimate for the value of

$$\frac{28.9 \times 5.49}{0.472 + 0.97}$$

You must show all your working.

..... [2]

- (d) Find the value of

(i)  $\sqrt{1849}$

..... [1]

(ii)  $5^0 - 5^{-1}$

..... [1]

(iii)  $\frac{5 \sin 30 - 8}{11}$ .

..... [1]

(e) A cyclist travels at a constant speed of 8.5 metres per second.

- (i) Work out how long the cyclist takes to travel a distance of 5.27 kilometres.  
Give your answer in minutes and seconds.

..... min ..... s [4]

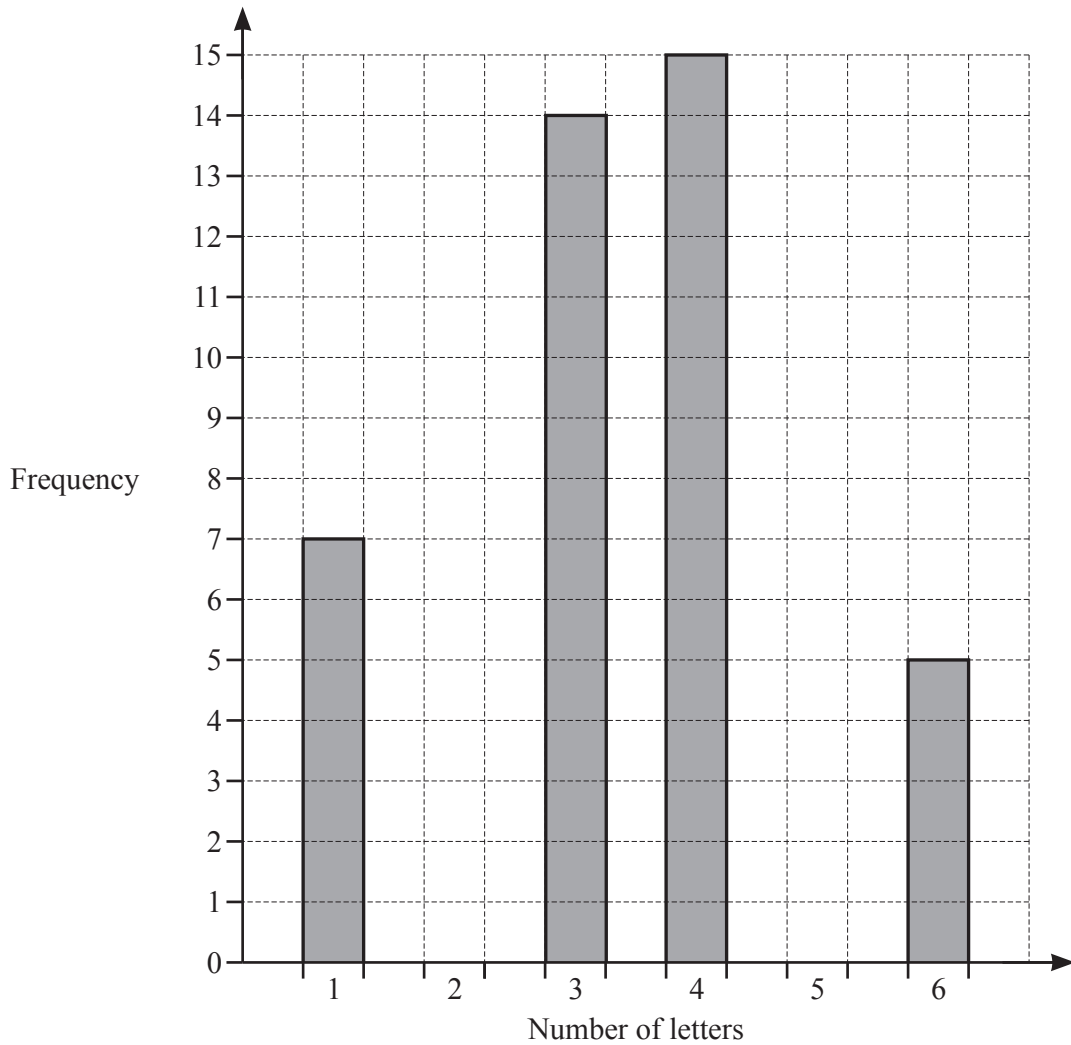
- (ii) The cyclist increases speed from 8.5 m/s to 10.2 m/s.

Work out the percentage increase in speed.

..... % [2]

- 2 (a) Mika counts the number of letters in each of the 61 words in a paragraph. Some of his results are shown in the table and bar chart.

Number of letters	1	2	3	4	5	6
Frequency	7	12		15		5



- (i) Complete the table and the bar chart. [3]
- (ii) Write down the mode.

..... [1]

- (b) Grace also counts the number of letters in each word of another paragraph. Her results are shown in the table.

Number of letters	1	2	3	4	5	6
Frequency	10	18	9	6	5	2

- (i) Work out the mean.

..... [3]

- (ii) She picks one of these words at random.

Find the probability that it has more than three letters.

..... [2]

- (c) She counts the number of letters in each word in the next sentence. These are her results.

3    4    1    7    9    2    6    5    4    2    3    2

- (i) Find the median.

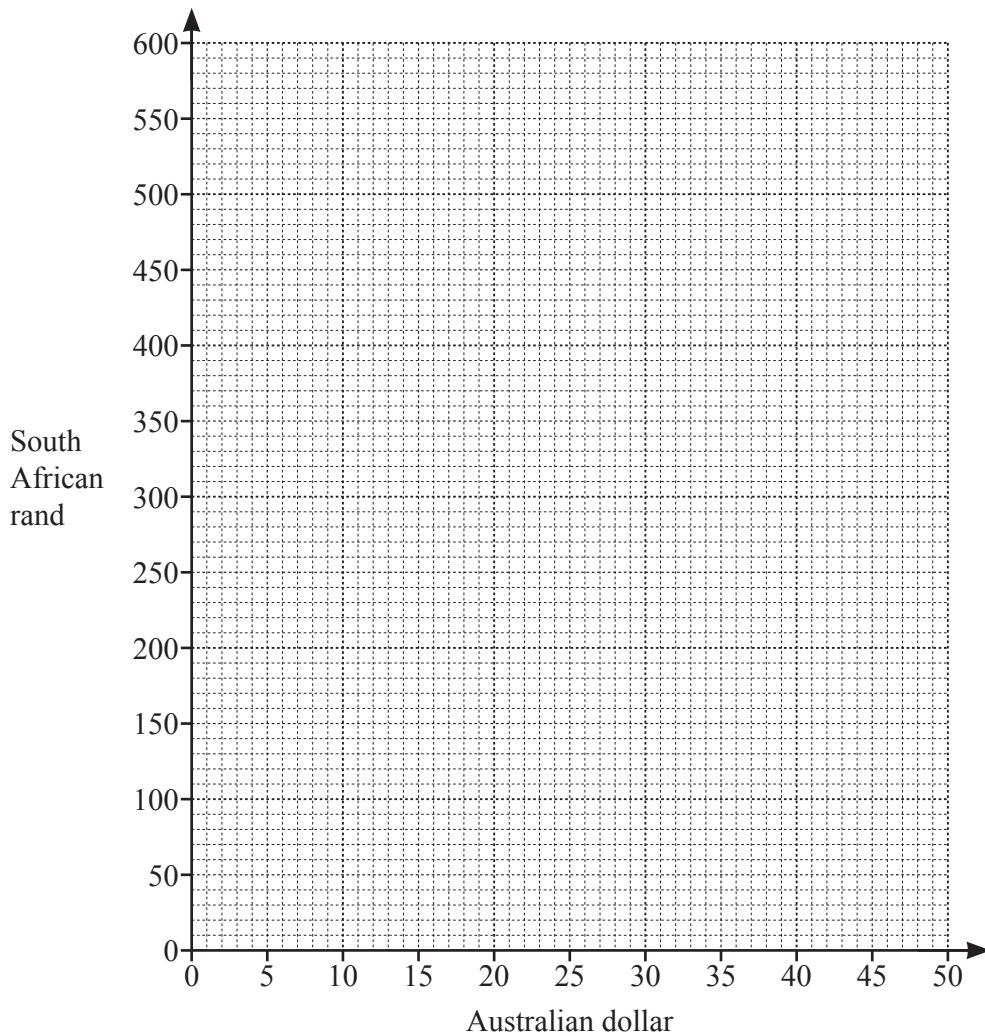
..... [2]

- (ii) Find the range.

..... [1]

3 (a)

50 Australian dollars = 540 South African rands
---



(i) On the grid, draw a conversion graph between Australian dollars and South African rands. [2]

(ii) A watch costs 1350 South African rands.

Find the cost of this watch in Australian dollars.

..... Australian dollars [2]

- (b) (i) A plane leaves Sydney at 21 48 local time to fly to Johannesburg.  
The flight takes 14 hours 15 minutes.  
The local time in Sydney is 8 hours ahead of the local time in Johannesburg.

Find the local time in Johannesburg when the plane arrives.

..... [3]

- (ii) On the plane there are 315 people.  
The ratio of children : adults = 7 : 8.

Work out the number of adults on the plane.

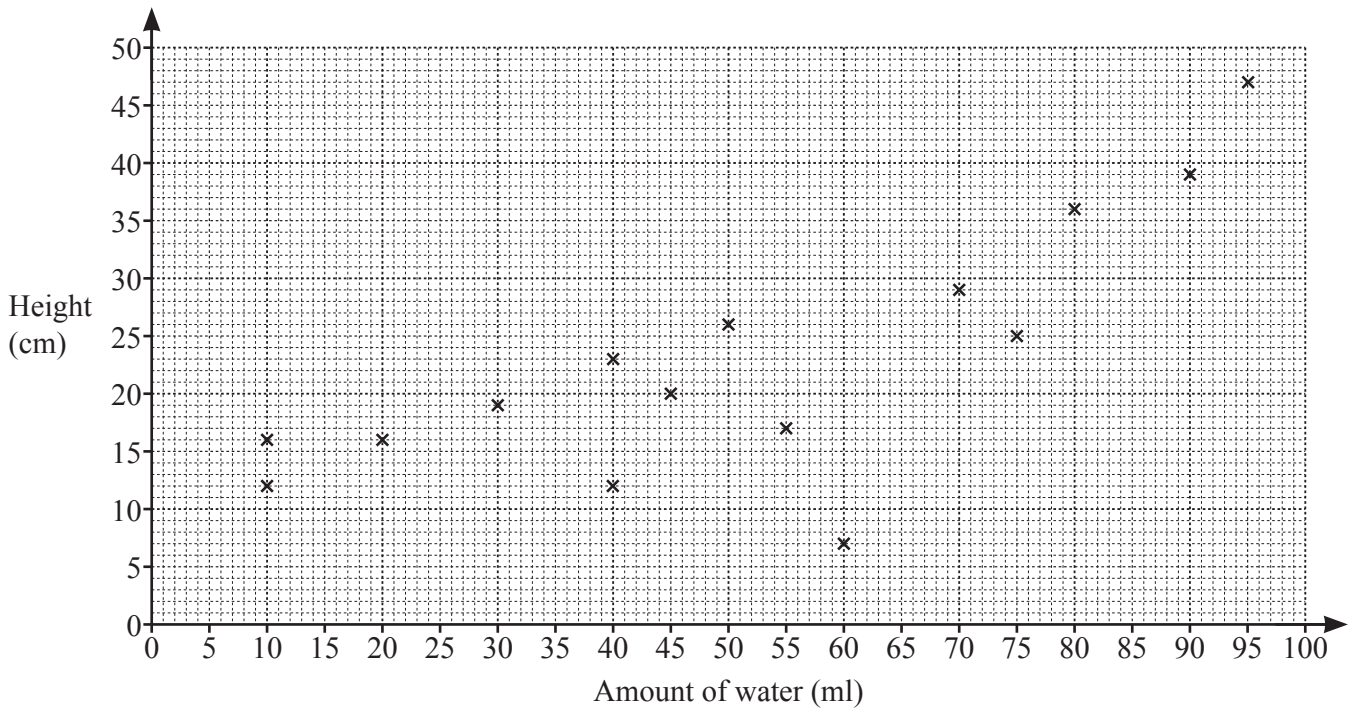
..... [2]

- (iii) Another plane has 420 seats.  
90% of the seats are occupied.

Work out the number of seats that are occupied.

..... [2]

- 4 Fidel gives different amounts of water to some plants.  
The scatter diagram shows the height (cm) and the amount of water (ml) for each of 15 plants.



- (a) Plot these two results on the scatter diagram.

Amount of water (ml)	60	85
Height (cm)	27	41

[1]

- (b) What type of correlation is shown in the scatter diagram?

..... [1]

- (c) One of the plants had a lower height than expected for the amount of water given.

On the scatter diagram, put a ring around the point for this plant.

[1]



(d) (i) On the scatter diagram, draw a line of best fit. [1]

(ii) Another plant is given 65 ml of water.

Use your line of best fit to estimate the height of this plant.

..... cm [1]

(e) Find the percentage of these 17 plants that have a height of more than 24 cm.  
Give your answer correct to 1 decimal place.

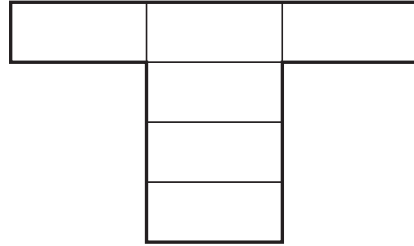
..... % [3]

5 (a)



NOT TO SCALE

This rectangle has an area of  $12 \text{ cm}^2$  and a perimeter of  $16 \text{ cm}$ .



NOT TO SCALE

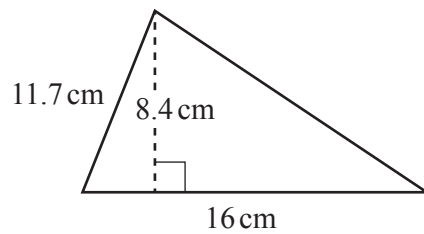
This shape is made from six of these rectangles.

Find the area and perimeter of this shape.

Area = .....  $\text{cm}^2$

Perimeter = .....  $\text{cm}$  [4]

(b)



NOT TO SCALE

Find the area of this triangle.

.....  $\text{cm}^2$  [2]

- (c) A circle has a circumference of 28 cm.

Work out the radius of the circle.

..... cm [2]

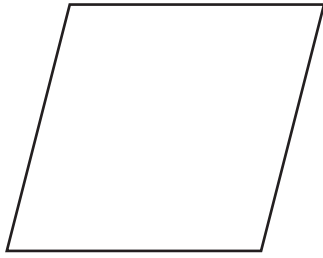
- (d) A cube has a volume of  $125 \text{ m}^3$ .

Work out the surface area of the cube.

.....  $\text{m}^2$  [3]

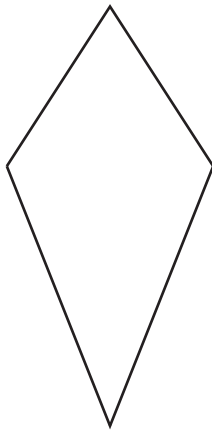
6 (a) For each quadrilateral, draw any lines of symmetry and write down its mathematical name.

(i)



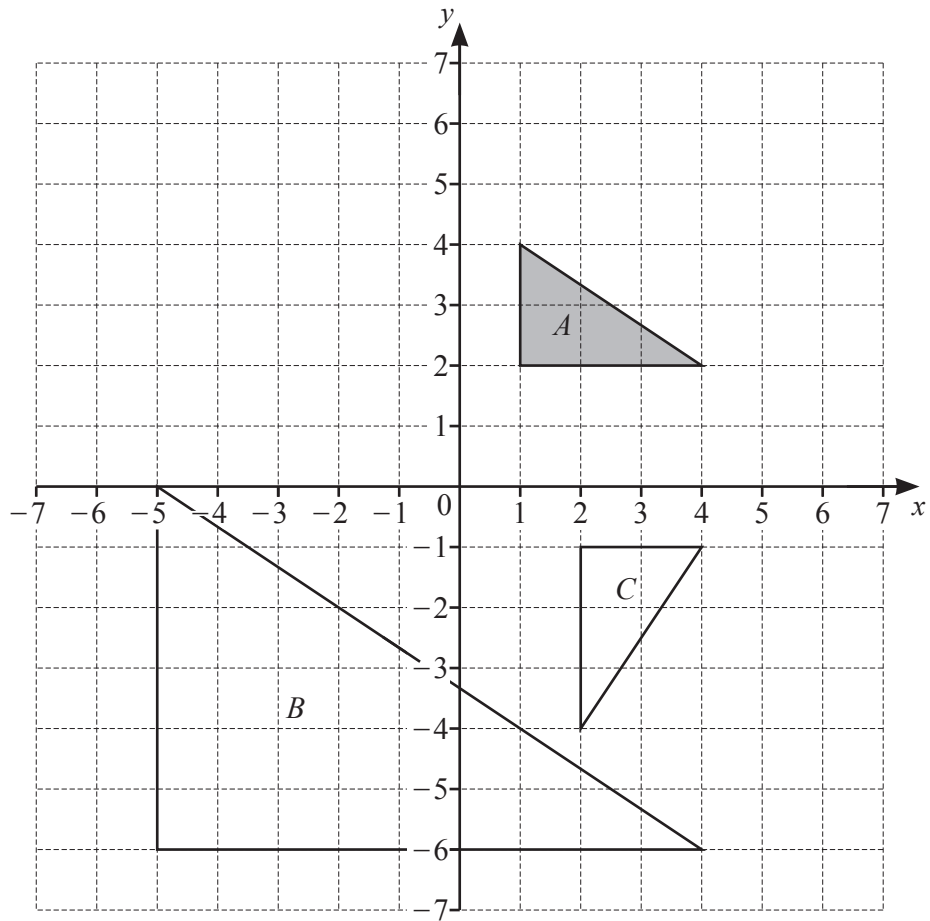
Name ..... [3]

(ii)



Name ..... [2]

(b) The diagram shows three triangles  $A$ ,  $B$  and  $C$ , on a grid.



(i) Describe fully the **single** transformation that maps

(a) triangle  $A$  onto triangle  $B$

.....  
 ..... [3]

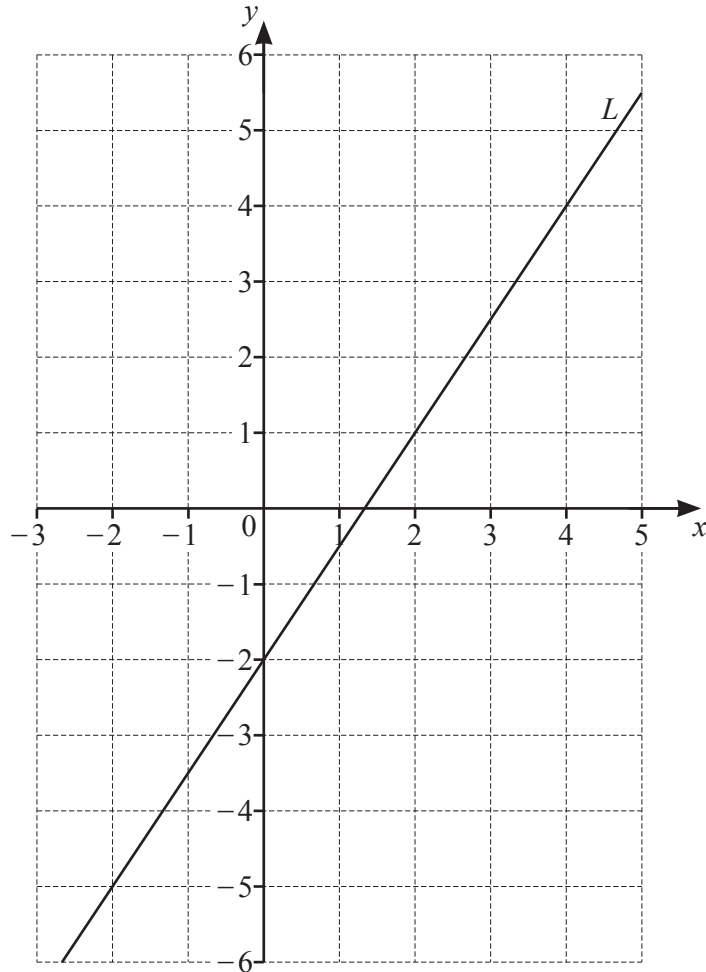
(b) triangle  $A$  onto triangle  $C$ .

.....  
 ..... [3]

(ii) On the grid, reflect triangle  $A$  in the line  $x = -1$ .

[2]

7 (a)



- (i) Find the equation of line  $L$ .  
Give your answer in the form  $y = mx + c$ .

$y = \dots\dots\dots$  [2]

- (ii) On the grid, draw the line  $y = 1$ . [1]

- (iii) Write down the coordinates of the point where the two lines intersect.

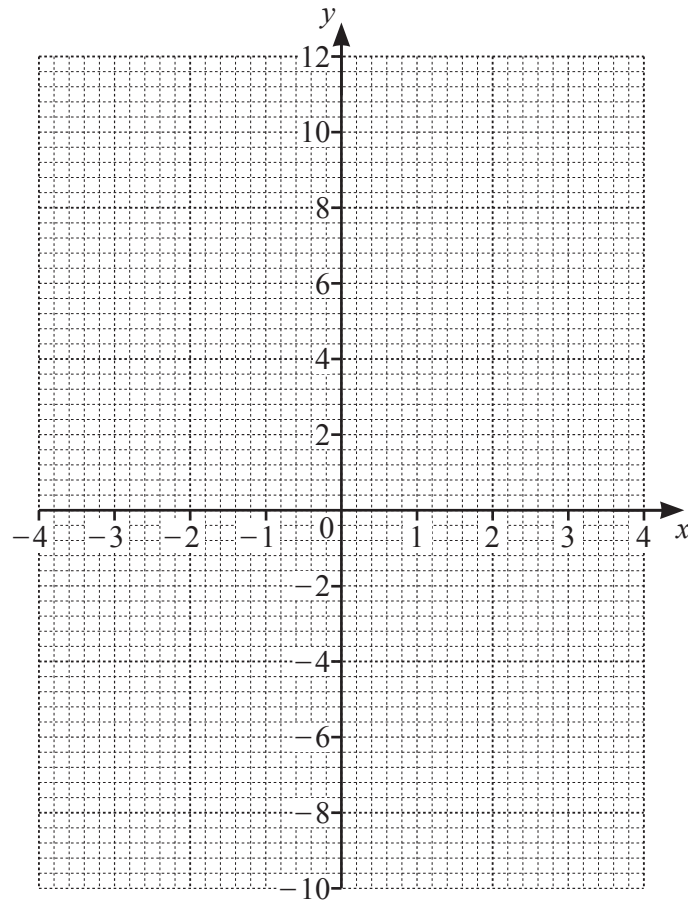
( $\dots\dots\dots$ ,  $\dots\dots\dots$ ) [1]

(b) (i) Complete the table of values for  $y = x^2 + x - 8$ .

$x$	-4	-3	-2	-1	0	1	2	3	4
$y$	4	-2		-8	-8		-2	4	

[2]

(ii) On the grid, draw the graph of  $y = x^2 + x - 8$  for  $-4 \leq x \leq 4$ .



[4]

(iii) Write down the equation of the line of symmetry of the graph.

..... [1]

(iv) Use your graph to solve the equation  $x^2 + x - 8 = 0$ .

$x =$  ..... or  $x =$  ..... [2]

8 (a)  $T = 5P + 3Q$

Find the value of  $T$  when  $P = 6$  and  $Q = 8$ .

$T = \dots\dots\dots$  [2]

(b) Simplify.

$$3a - 7b + 2a + 4b$$

$\dots\dots\dots$  [2]

(c) Multiply out.

$$5(2x - 3y)$$

$\dots\dots\dots$  [1]

(d) Solve.

$$5x - 1 = 3x + 19$$

$x = \dots\dots\dots$  [2]

(e) Make  $t$  the subject of the formula  $p = 5t - 3$ .

$t = \dots\dots\dots$  [2]



- (f) Entry to a castle costs  $\$x$  for an adult and  $\$y$  for a child.

Entry for 2 adults and 3 children costs  $\$15.00$  .

Entry for 3 adults and 5 children costs  $\$23.50$  .

Write down a pair of simultaneous equations to show this information and solve them to find the value of  $x$  and the value of  $y$ .

You must show all your working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots [6]$$

9 (a) These are the first four terms of a sequence.

2      8      14      20

(i) Write down the next term.

..... [1]

(ii) Write down the term to term rule for continuing the sequence.

..... [1]

(iii) Find an expression for the  $n$ th term.

..... [2]

(b) (i) Find the first three terms of the sequence with  $n$ th term  $n^2 + 5$ .

....., ....., ..... [2]

(ii) These are the first four terms of another sequence.

7      10      15      22

Find an expression for the  $n$ th term of this sequence.

..... [1]



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