GradeMax

Cambridge Assessment International Education

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0382439389

MATHEMATICS **0580/32**

Paper 3 (Core) **February/March 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 π, 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 **16** pages.

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1 **(a)** The table shows some information about the opening hours of a café.
The café opens 4 days a week.

Day	Opening time	Closing time	Number of hours open
Thursday	8 am	4.30 pm	
Friday	8.30 am		$7\frac{1}{2}$
Saturday	9.30 am	5.30 pm	8
Sunday		3.30 pm	5
		Total number of hours open	29

Complete the table. [3]

(b) **(i)** A waiter works 29 hours a week in the café.
He is paid $9.50 per hour.
He is paid for 52 weeks of the year.

Work out his total pay for the year.

$ ..... [2]

(ii) The chef is paid 32% more than the waiter per hour.

Work out how much the chef is paid per hour.

$ ..... [2]

(c) Here is part of the café's menu.

MENU

Cup of coffee	$2.50	Slice of pizza	$3.70
Cup of tea	$2.30		

Raj buys 2 cups of coffee, 1 cup of tea and 3 slices of pizza.

Calculate the change he receives from $20.

$ ..... [3]

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(d) The chef records the types of baguettes the café sells in one day.

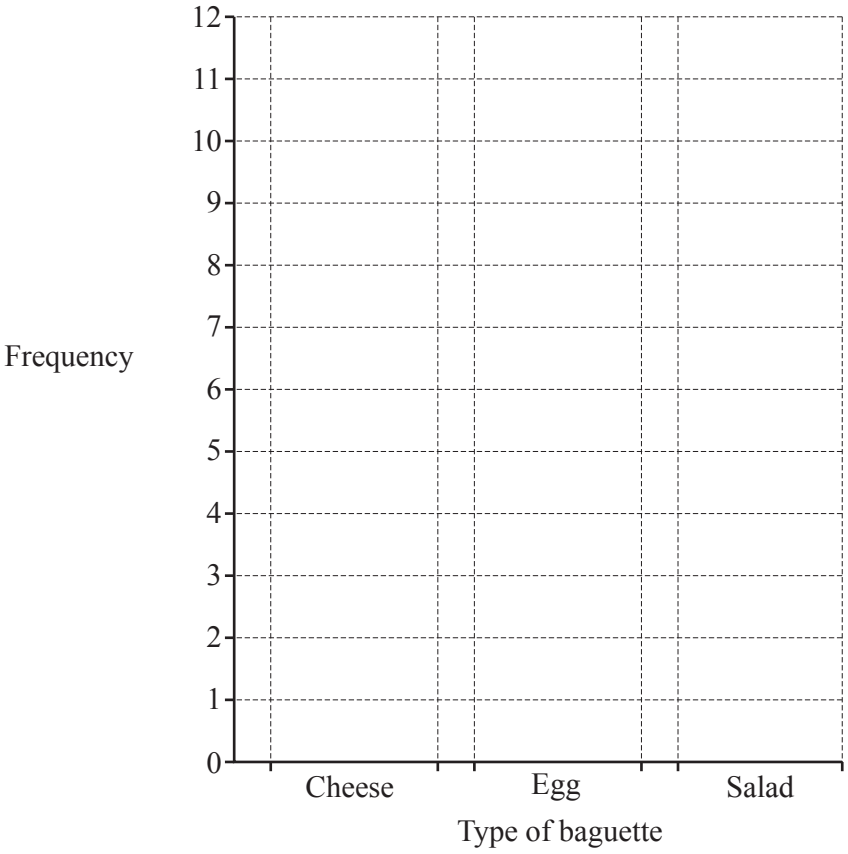
salad	cheese	salad	salad	egg	cheese	cheese	salad	cheese	egg	salad
cheese	salad	salad	egg	cheese	salad	salad	egg	salad	cheese	salad

(i) Complete the frequency table to show this information.
You may use the tally column to help you.

Type of baguette	Tally	Frequency
Cheese		
Egg		
Salad		

[2]

(ii) On the grid, draw a bar chart to show this information.



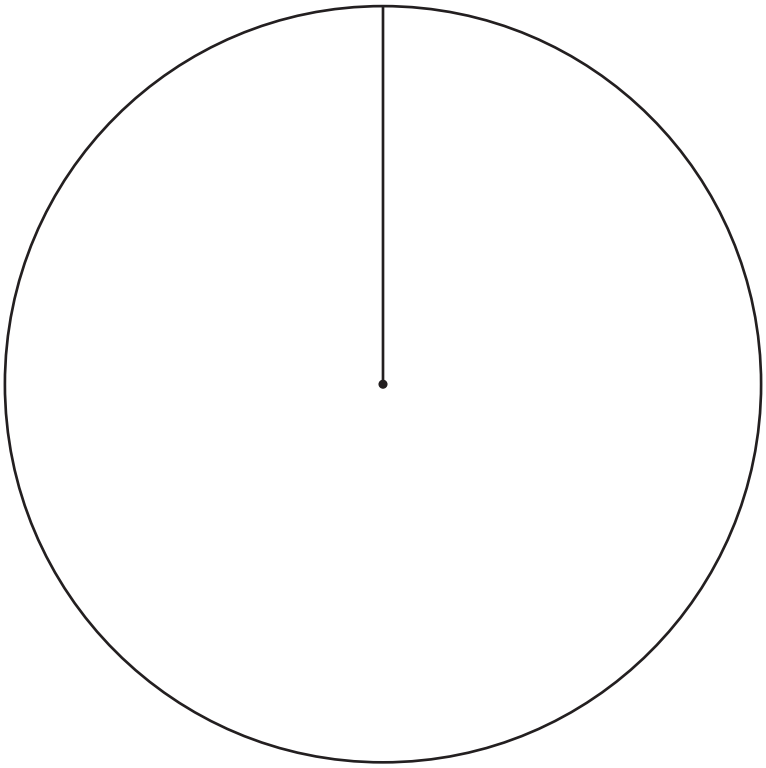
[2]

2 **(a)** Manjit asks 30 students whether they prefer joke books, puzzle books or poetry books. The results are shown in the table.

Type of book	Number of students	Pie chart sector angle
Joke	8	
Puzzle	18	
Poetry	4	

(i) Complete the table. [2]

(ii) Complete the pie chart. [2]



(iii) One of the students is chosen at random.

Find the probability that this student prefers puzzle books.

..... [1]

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(b) The stem-and-leaf diagram shows the test scores for 24 students.

2	2 5 6 9
3	3 7 8
4	2 3 5 5 7 8
5	1 1 1 5 6 8 9
6	0 2 5 7

Key : 4 | 2 represents 42

(i) Write down the mode.

..... [1]

(ii) 75% of the 24 students pass the test.

Work out the lowest score needed to pass the test.

..... [2]

(iii) Work out the range.

..... [1]

(iv) Frankie was absent on the day of the test.
His score is not on the stem-and-leaf diagram.
When he takes the test, his score increases the range by 3 marks.

Write down the two possible values of Frankie's score.

..... or ..... [2]

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3 **(a)** A recipe for making 20 biscuits uses 150 g flour, 125 g butter and 50 g sugar.

(i) Write the ratio flour : butter : sugar in its simplest form.

flour : butter : sugar = ... : ..... : ..... [2]

(ii) Work out the amount of flour, butter and sugar needed to make 50 biscuits.

flour ..... g

butter ..... g

sugar ..... g [3]

(b) **(i)** A recipe for making one loaf of bread uses 600 g of flour.
A sack of flour contains 16 kg of flour.

Complete the statements.

One sack of flour makes a maximum of ..... loaves of bread.

The amount of flour left over is ..... g.

[4]

(ii) The amount of flour in a sack decreases from 16 kg to 15 kg.

Work out the percentage decrease of flour in the sack.

..... % [2]

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4 **(a)** Write 6479 correct to the nearest 100.

..... [1]

(b) Write down the multiple of 13 that is between 100 and 110.

..... [1]

(c) Find the reciprocal of 0.6 .

..... [1]

(d) Work out.

$3 + 4 \times 2$

..... [1]

(e) Write down an irrational number with a value between 15 and 20.

..... [1]

(f) By writing each number in the calculation correct to 1 significant figure, find an estimate for the value of

$$\frac{423.8 - 78.4}{23.5}.$$

You must show all your working.

..... [2]

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[Turn over

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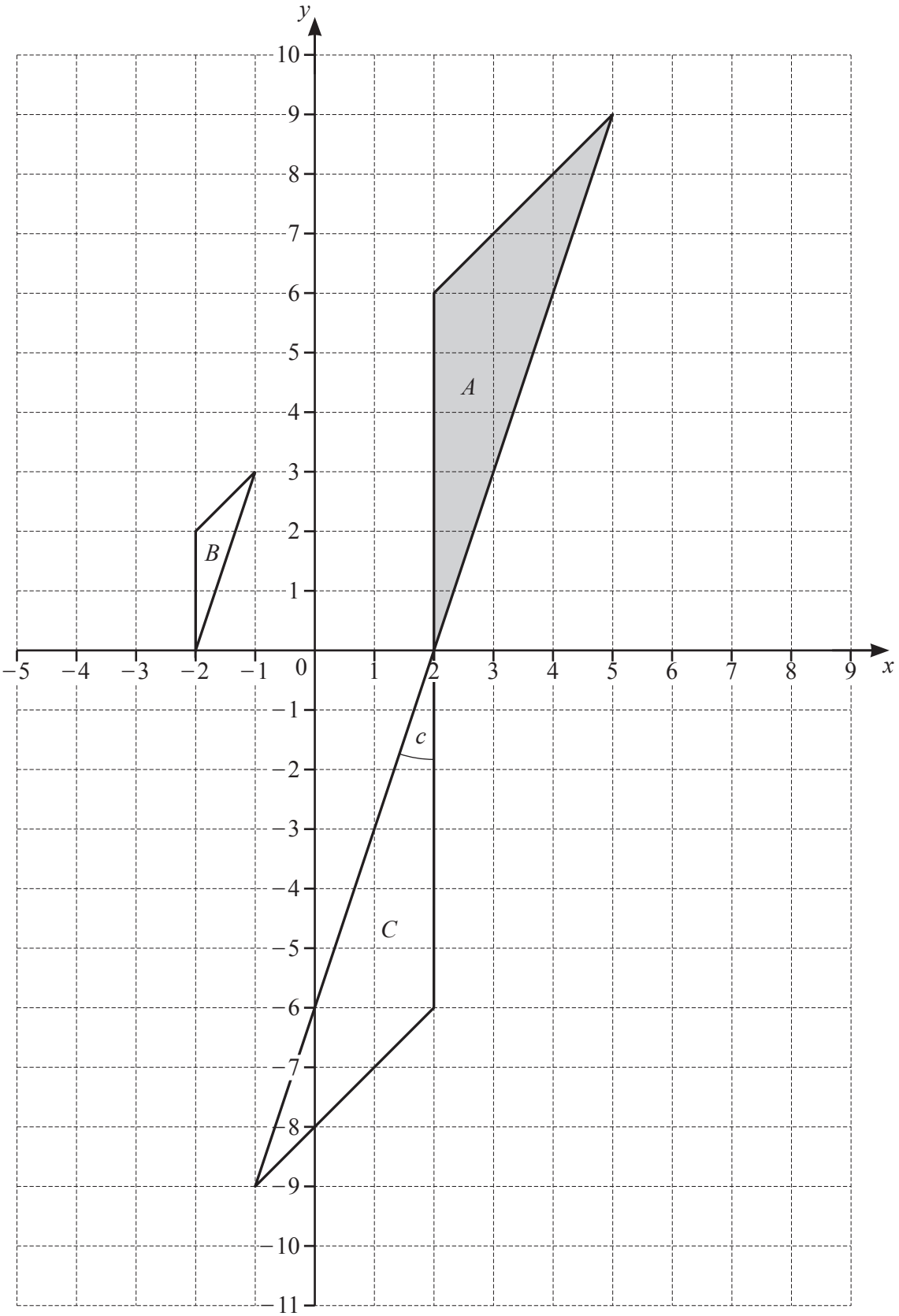
5 The diagram shows three triangles, A, B and C, on a 1 cm^2 grid.



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(a) Measure angle c.

Angle $c =$ ..... [1]

(b)

hypotenuse	equilateral	isosceles
acute	congruent	obtuse
trigonometry	cosine	reflex

Complete these statements using two different words from the box.

(i) Angle c is ..... [1]

(ii) Triangles A and C are ..... [1]

(c) Work out the area of triangle A.
Give the units of your answer.

.... [3]

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

(i) triangle A onto triangle B

.....

..... [3]

(ii) triangle A onto triangle C.

.....

..... [3]

(e) On the grid, draw the image of

(i) triangle A after a translation by the vector $\begin{pmatrix} 3 \\ -10 \end{pmatrix}$ [2]

(ii) triangle A after a reflection in the line $x = 4$. [2]

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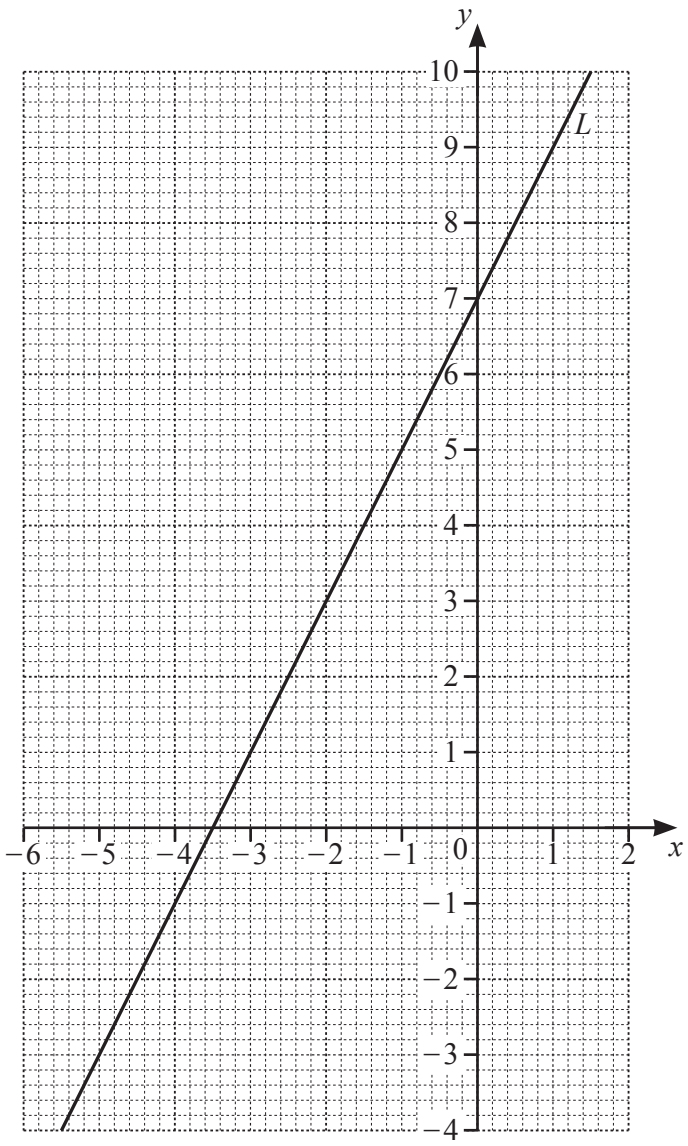
6



(a) Find the equation of line L in the form $y = mx + c$.

$y =$ ..... [2]

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(b) Write down the coordinates of the point where line L crosses the x-axis.

(..... , ...) [1]

(c) **(i)** Complete the table of values for $y = x^2 + 5x + 3$.

x	−6	−5	−4	−3	−2	−1	0	1
y	9		−1			−1		

[3]

(ii) On the grid, draw the graph of $y = x^2 + 5x + 3$ for $-6 \leqslant x \leqslant 1$. [4]

(d) **(i)** On the grid, draw the line $y = 6$. [1]

(ii) Use your graphs to solve the equation $x^2 + 5x + 3 = 6$.

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

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[Turn over

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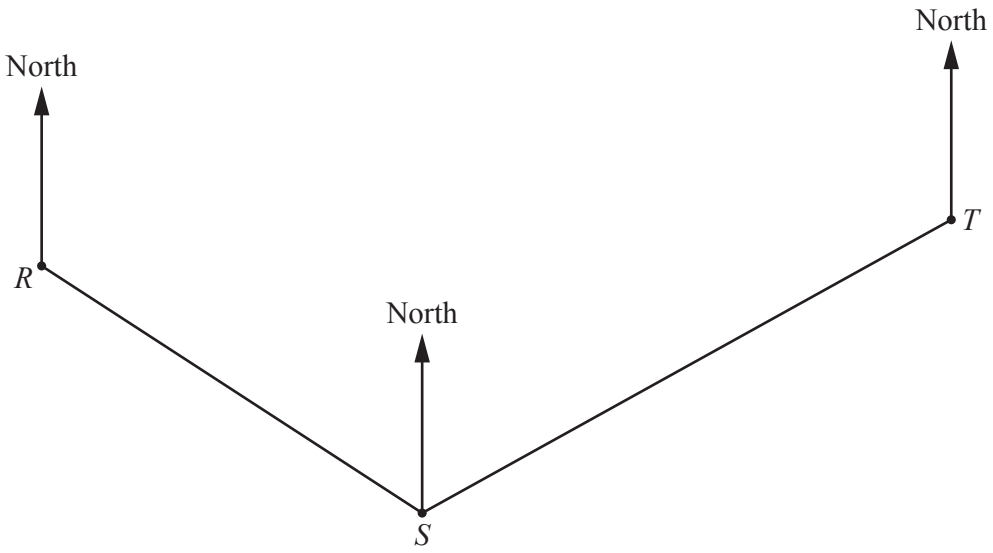
7 The scale drawing shows the positions of three towns, *R*, *S* and *T*, on a map.
RS and *ST* are straight roads between the towns.
The scale is 1 centimetre represents 8 kilometres.



Scale: 1 cm to 8 km

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(a) Work out the actual distance between R and S.

..... km [2]

(b) Another town, V, is on a bearing of 163° from R and on a bearing of 215° from T.

Mark the position of V on the map. [2]

(c) A man cycles at a constant speed of 24 km/h along the straight road from S to T.
After 1 hour and 50 minutes he stops at a café, C.

Mark the position of C on the map.
You must show all your working.

[3]

(d) A hotel, H, is on a bearing of 321° from R.

Work out the bearing of R from H.

..... [2]

(e) Write the scale 1 cm to 8 km in the form $1 : n$.

1 : ..... [1]

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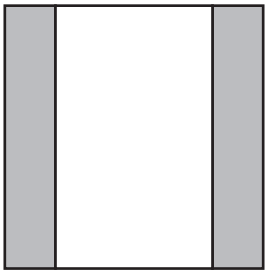
8 **(a)**



(i) Write down the order of rotational symmetry of the diagram.

..... [1]

(ii) On the diagram, draw all the lines of symmetry. [2]

(b) The grid shows the first three diagrams in a sequence.
Each diagram is made using small grey and small white squares to make grey and white columns.

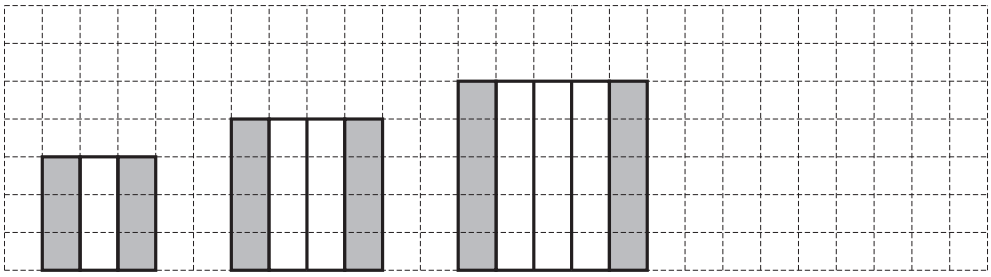


Diagram 1 Diagram 2 Diagram 3 Diagram 4

(i) On the grid, draw Diagram 4. [1]

(ii) **(a)** Complete this statement.

Diagram *n* has ..... grey columns. [1]

(b) Find an expression, in terms of *n*, for the total number of columns in Diagram *n*.

..... [2]

(c) Find an expression, in terms of *n*, for the fraction of columns that are grey in Diagram *n*.

..... [1]

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(iii)

Diagram number	1	2	3	4	5
Number of grey squares	6	8	10		
Number of white squares	3	8	15		
Total number of squares	9	16	25		

(a) Complete the table. [3]

(b) Write an expression, in terms of n, for the number of grey squares in Diagram n.

..... [2]

(c) The number of white squares in Diagram n is $n(n+2)$.

Work out the number of white squares in Diagram 30.

..... [2]

(d) Diagram k has a **total** of 1296 squares.

Work out the value of k.

$k =$ ..... [2]

Question 9 is printed on the next page.

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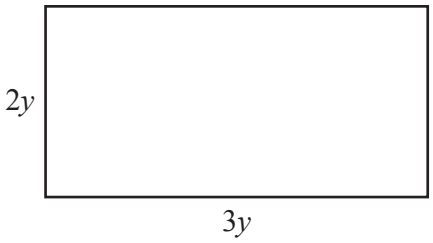
9 (a)

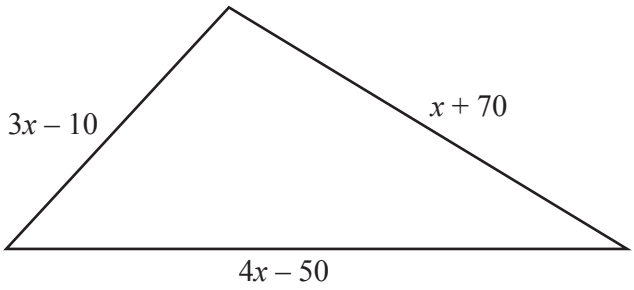


NOT TO SCALE

Write down an expression for the area of this rectangle.
Give your answer in its simplest form.

..... [2]

(b) In this part, all measurements are in centimetres.



NOT TO SCALE

The perimeter of the triangle is 526 cm.

Find the value of x.

$x =$ ..... [3]

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