

1 The population of a village is 2250.

- (a) 32% of the population are children.
Calculate the number of children in the village.

Answer(a) [2]

(b) 360 people in the village are over the age of 60.

- (i) For these 360 people, the ratio of men to women is 2 : 7.
Calculate how many men are over the age of 60.

Answer(b)(i) [2]

(ii) Write 360 as a fraction of 2250 in its lowest terms.

Answer(b)(ii) [2]

- (c) The population of 2250 is expected to increase by 18% next year.
Calculate the expected population next year.

Answer(c) [3]

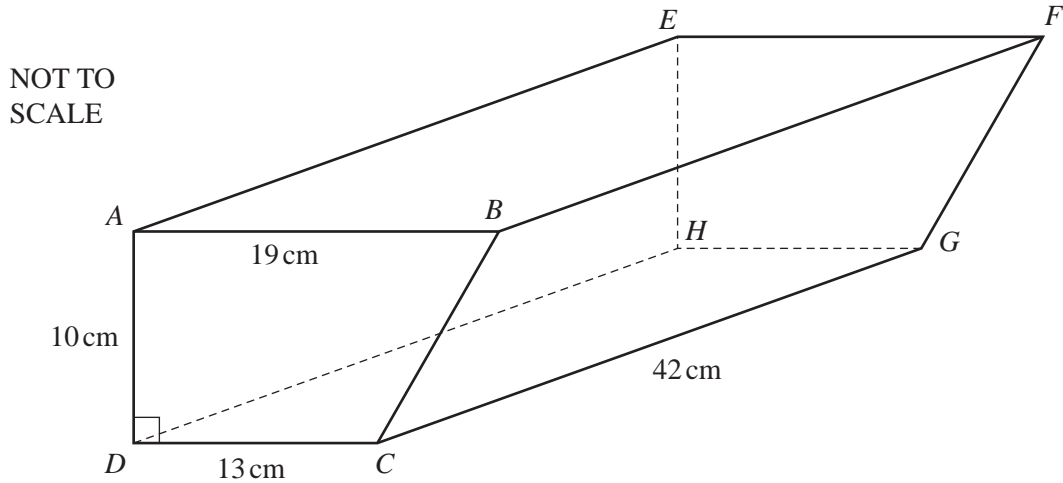
(d) Write the number 2250 in standard form.

Answer(d) [1]

- (e) Another village has a population of 1770, correct to the nearest ten.
Write down the lower bound for the population of this village.

Answer(e) [1]

2



For
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The diagram shows a block of stone in the shape of a prism of length 42 cm.
The cross-section is a trapezium $ABCD$.
 $AB = 19$ cm, $AD = 10$ cm, $DC = 13$ cm and angle $ADC = 90^\circ$.

(a) Calculate

(i) the perimeter of the rectangular face $ABFE$,

Answer(a)(i) cm [2]

(ii) the area of the cross-section $ABCD$,

Answer(a)(ii) cm^2 [3]

(iii) the volume of the block of stone.

Answer(a)(iii) cm^3 [2]

(b) The mass of 1 cubic centimetre of the stone is 4 grams.
Calculate the mass of the block.
Give your answer in kilograms.

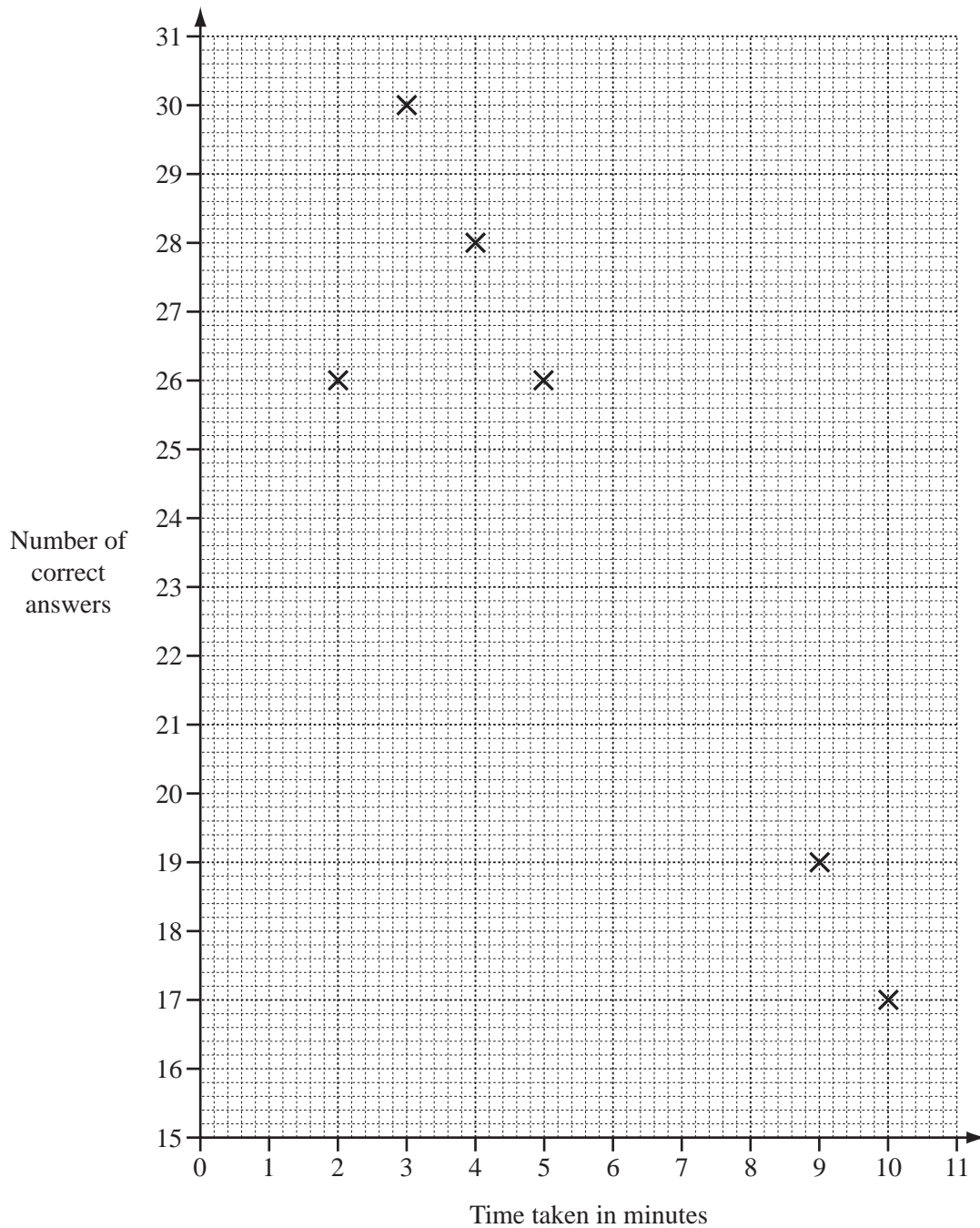
Answer(b) kg [3]

- 3 Twelve students each answer 30 questions in a quiz.

The time taken and the number of correct answers for each student is given in the table.

Time taken in minutes	9	4	5	10	3	2	8	8	4	5	6	7
Number of correct answers	19	28	26	17	30	26	25	20	23	21	24	22

- (a) Complete the scatter diagram below to show this information.
The first six points have been plotted for you.



[3]

(b) What type of correlation does the scatter diagram show?

Answer(b) [1]

(c) (i) Find the range of the **time taken**.

Answer(c)(i) min [1]

(ii) Calculate the mean time taken.

Answer(c)(ii) min [3]

(d) (i) Find the mode for the **number of correct answers**.

Answer(d)(i) [1]

(ii) Find the median for the number of correct answers.

Answer(d)(ii) [1]

(e) One of the 12 students is selected at random.

Write down the probability that the student

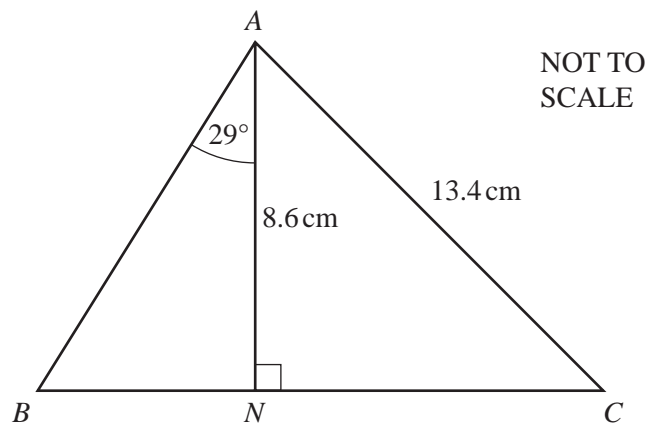
(i) took more than 8 minutes to answer the quiz,

Answer(e)(i) [1]

(ii) took less than 5 minutes **and** had more than 24 correct answers.

Answer(e)(ii) [2]

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In triangle ABC , $AN = 8.6$ cm and is perpendicular to BC .

Angle $BAN = 29^\circ$ and $AC = 13.4$ cm.

(a) Use trigonometry to calculate

(i) the length of BN ,

Answer(a)(i) $BN = \dots\dots\dots$ cm [3]

(ii) angle CAN .

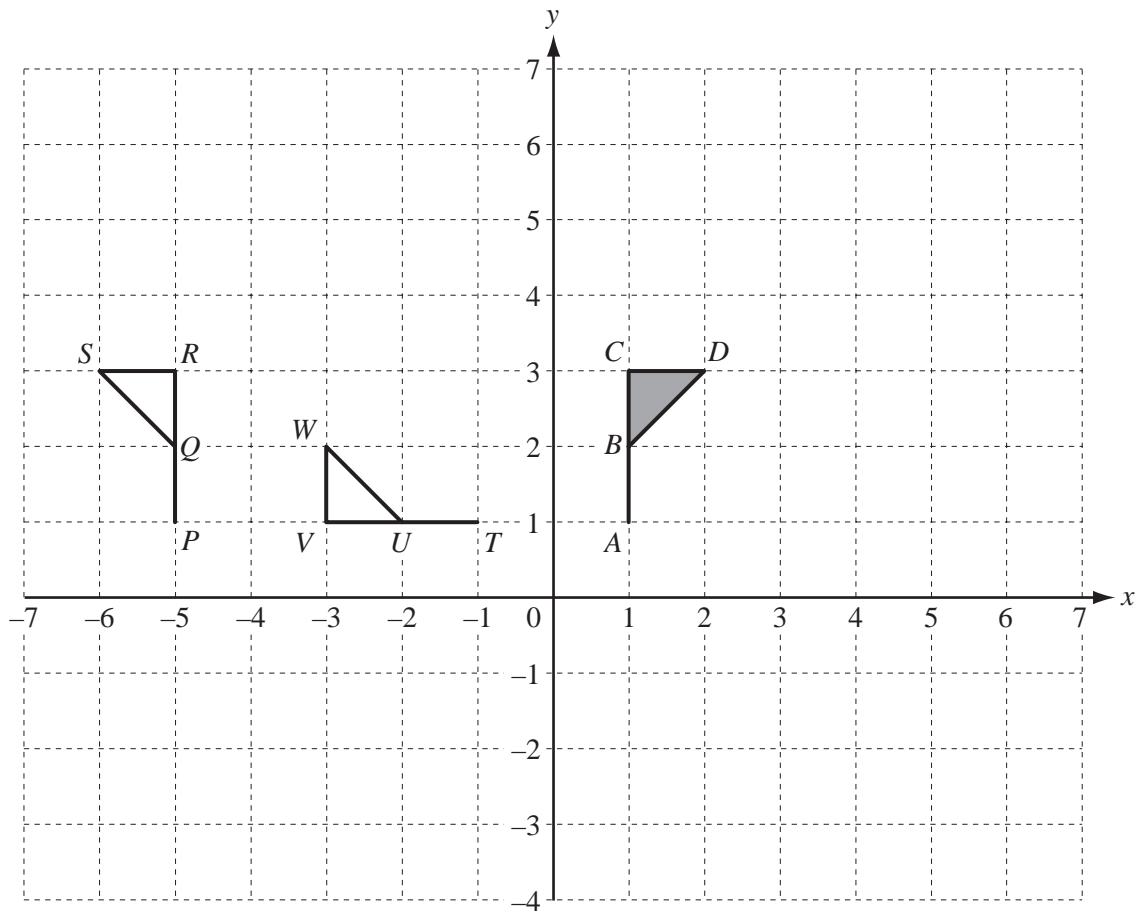
Answer(a)(ii) Angle $CAN = \dots\dots\dots$ [2]

(b) Calculate the length of NC .

Answer(b) $NC = \dots\dots\dots$ cm [3]

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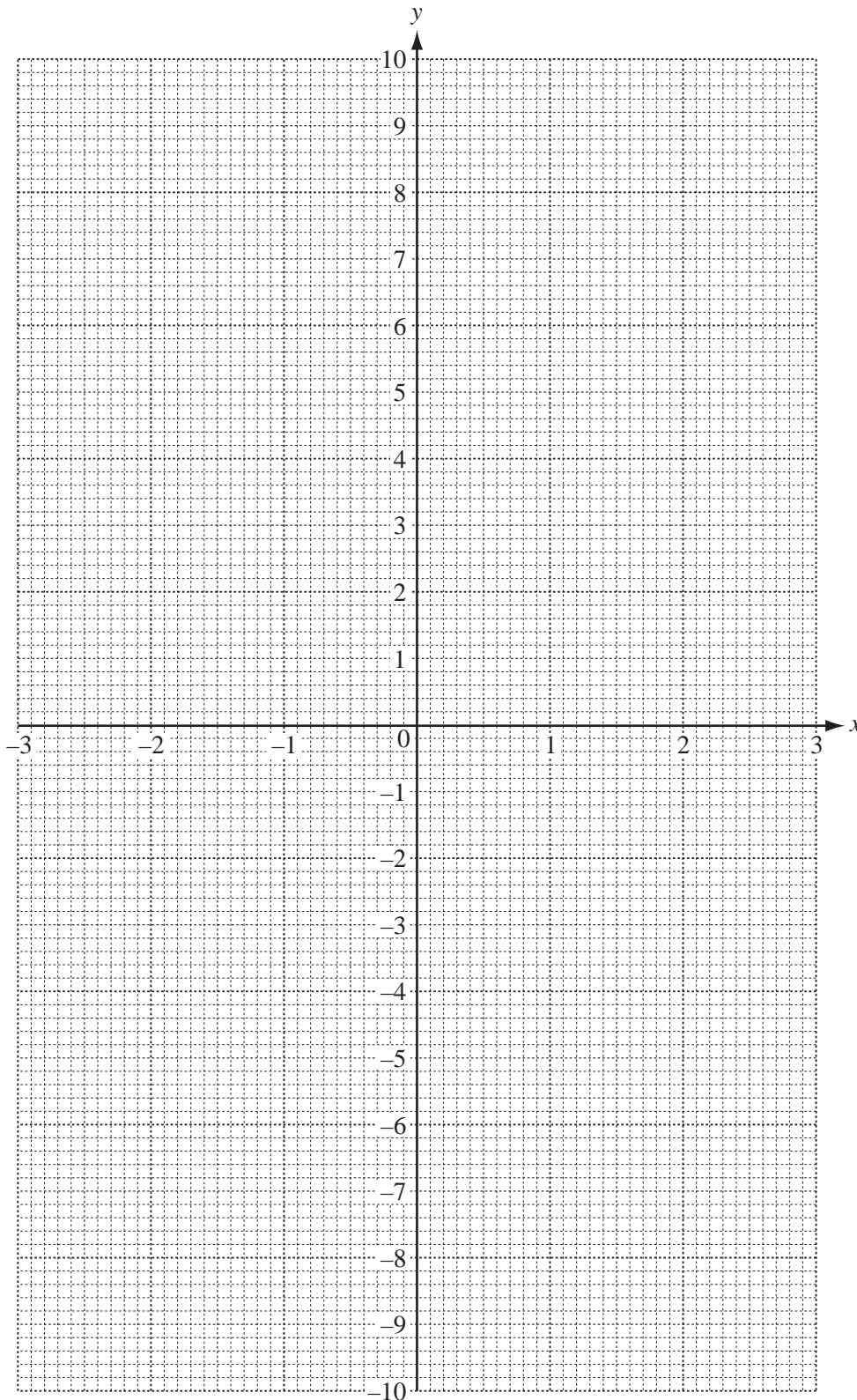
- (a) On the grid, draw the image of
- (i) the flag $ABCD$ after translation by $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$, [2]
 - (ii) the flag $ABCD$ after enlargement, scale factor 2, centre the origin, [2]
 - (iii) the flag $ABCD$ after reflection in the x -axis. [2]
- (b) Describe fully the **single** transformation which maps $ABCD$ onto $PQRS$. [2]
-
- (c) Describe fully the **single** transformation which maps $ABCD$ onto $TUVW$. [3]
-

- 6 (a) Complete the table of values for the function $y = \frac{3}{x}$, $x \neq 0$.

x	-3	-2.5	-2	-1.5	-1	-0.5	-0.3		0.3	0.5	1	1.5	2	2.5	3
y	-1	-1.2		-2	-3	-6					3	2	1.5		1

[3]

- (b) On the grid below, draw the graph of $y = \frac{3}{x}$ for $-3 \leq x \leq -0.3$ and $0.3 \leq x \leq 3$.



[5]

(c) Use your graph to solve the equation $\frac{3}{x} = 7$.

Answer(c) $x =$ [1]

(d) Complete the table of values for $y = \frac{2x}{3} - 1$.

x	-3	0	3
y			

[2]

(e) On the grid, draw the straight line $y = \frac{2x}{3} - 1$ for $-3 \leq x \leq 3$.

[2]

(f) Write down the co-ordinates of the points where the line $y = \frac{2x}{3} - 1$ intersects the graph of $y = \frac{3}{x}$.

Answer(f) (..... ,) and (..... ,) [2]

7

$$S = a + 4d$$

(a) Find S when $a = 17$ and $d = -5$.

Answer(a) $S =$ [2]

(b) Find d when $S = 37$ and $a = 5$.

Answer(b) $d =$ [2]

(c) Make d the subject of the formula $S = a + 4d$.

Answer(c) $d =$ [2]

8 In this question give all your answers to 2 decimal places.

- (a) Ankuri lends her brother \$275 for 4 years at a rate of 3.6% per year **simple** interest. Calculate the total amount her brother owes after 4 years.

Answer(a) \$ [3]

- (b) Monesh invests \$650 in a bank which pays 4% per year **compound** interest. Calculate the amount Monesh will have after 2 years.

Answer(b) \$ [3]

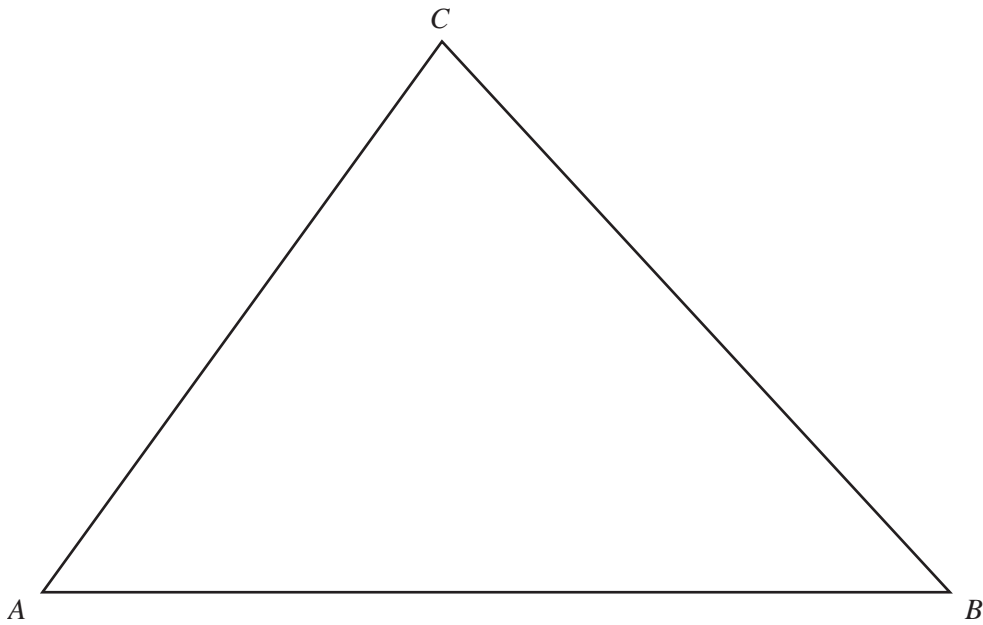
- (c) Theresa and Ian have 400 euros (€) each.

- (i) Theresa changes her €400 for pounds (£) when the exchange rate is €1 = £ 0.7857. Calculate the amount she receives.

Answer(c)(i) £ [2]

- (ii) Ian changes his €400 for dollars (\$) when the exchange rate is \$1 = € 0.6374. Calculate the amount he receives.

Answer(c)(ii) \$ [3]



Triangle ABC is drawn accurately.

(a) Measure and write down

(i) the length of AC ,

Answer(a)(i) $AC =$ cm [1]

(ii) the size of angle CAB .

Answer(a)(ii) Angle $CAB =$ [1]

(b) Construct accurately the locus of all the points 7 cm from C . [2]

(c) The point X lies **outside** the triangle ABC , with $CX = 7$ cm and angle $BCX = 67^\circ$.
Draw accurately the line CX . [2]

(d) Draw the line BX . Measure and write down the length of this line.

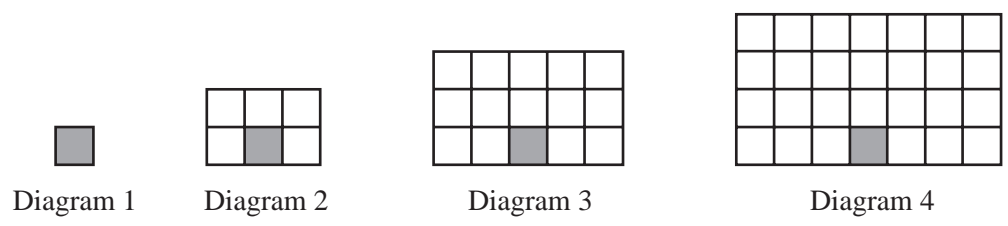
Answer(d) $BX =$ cm [1]

(e) **Using a straight edge and compasses only**, construct the locus of points equidistant from BC and from BX . [2]

Question 10 is printed on the next page.

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Look at the sequence of diagrams.

(a) Diagram 2 has a height of 2.

Write down the height of

(i) Diagram 5,

Answer(a)(i) [1]

(ii) Diagram 10,

Answer(a)(ii) [1]

(iii) Diagram n .

Answer(a)(iii) [1]

(b) Diagram 2 has a width of 3.

Find the width of

(i) Diagram 5,

Answer(b)(i) [1]

(ii) Diagram 10,

Answer(b)(ii) [1]

(iii) Diagram n .

Answer(b)(iii) [2]

(c) There are 6 squares in Diagram 2 and 15 squares in Diagram 3.

(i) Write down how many squares there are in Diagram 5.

Answer(c)(i) [1]

(ii) Explain how this is found from the height and width of the diagram.

Answer(c)(ii) [1]

(iii) Write down, in terms of n , how many squares there are in Diagram n .

Answer(c)(iii) [1]

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