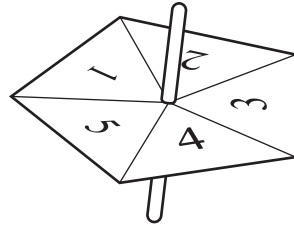


1



Jonah uses a fair five-sided spinner in a game.

(a) What is the probability that the spinner lands on

(i) 3,

Answer(a)(i) [1]

(ii) an even number,

Answer(a)(ii) [1]

(iii) a number greater than 5?

Answer(a)(iii) [1]

(b) Jonah spins the spinner 25 times and records the results in a frequency table.

Number that the spinner lands on	Frequency
1	8
2	4
3	5
4	
5	2

(i) Fill in the missing number.

[1]

(ii) Write down the mode.

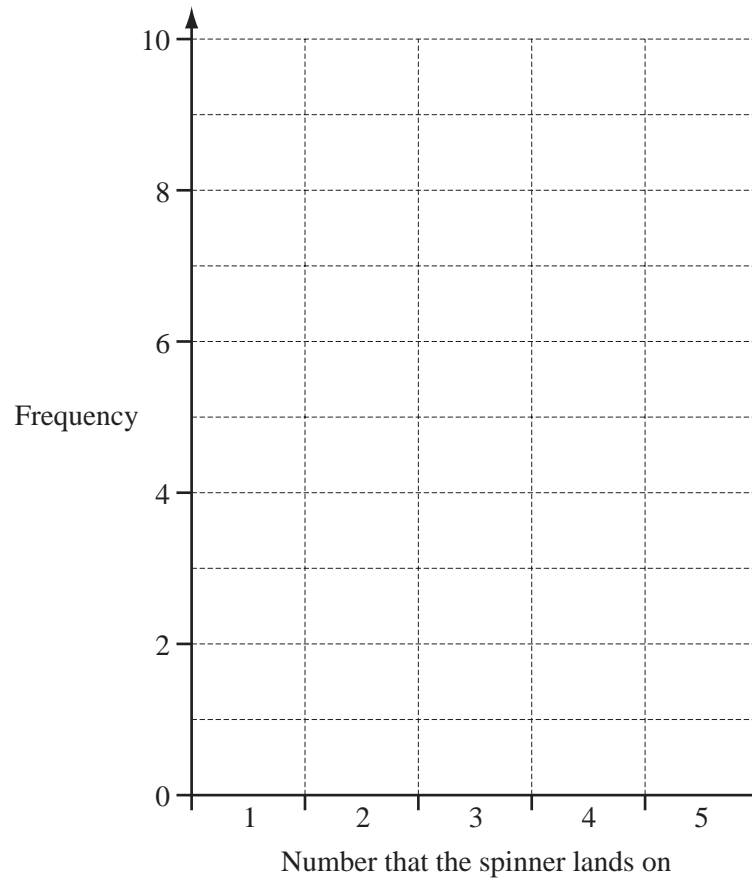
Answer(b)(ii) [1]

3

(ii) Calculate the mean.

Answer(b)(iii) [3]

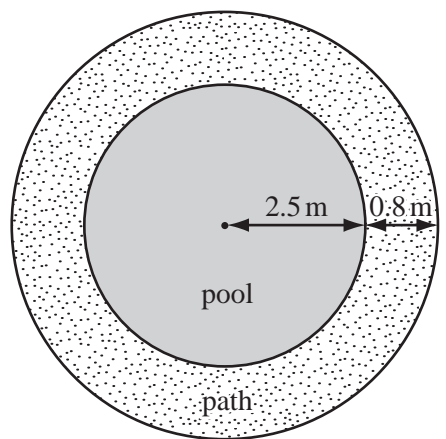
(iv) On the grid, draw a bar chart to show these results.



[3]

2

4



NOT TO
SCALE

The diagram shows a circular pool, of radius 2.5 metres, surrounded by a path 0.8 metres wide.

(a) Calculate

(i) the perimeter of the pool,

Answer(a)(i) m [2]

(ii) the area of the pool,

Answer(a)(ii) m² [2]

(iii) the area of the path.

Answer(a)(iii) m² [2]

(b) The water in the pool has a depth of 0.4 metres.
Calculate the volume of water in the pool.
Give your answer in litres. [1 cubic metre = 1000 litres.]

Answer(b) litres [2]

(c) When the pool is emptied for cleaning, the water flows out at a rate of 250 litres each minute.
Calculate how long it takes to empty the pool.
Give your answer to the nearest minute.

Answer(c) min [3]



3 (a) Bruce mixes blue and yellow paint to make green paint.
He uses blue and yellow paint in the ratio blue : yellow = 7 : 3.

(i) He makes 15 litres of green paint.
How many litres of yellow paint does he use?

Answer(a)(i) litres [2]

(ii) He buys the yellow paint in tins. Each tin contains 2 litres of paint.
Write down the number of tins of yellow paint he buys.

Answer(a)(ii) [1]

(b) Tins of red paint cost \$9.25 each.
In a sale, the shop reduces the price by 12%.

(i) Calculate the sale price.

Answer(b)(i) \$ [3]

(ii) Bruce buys 4 tins of red paint in the sale.
How much does he pay?

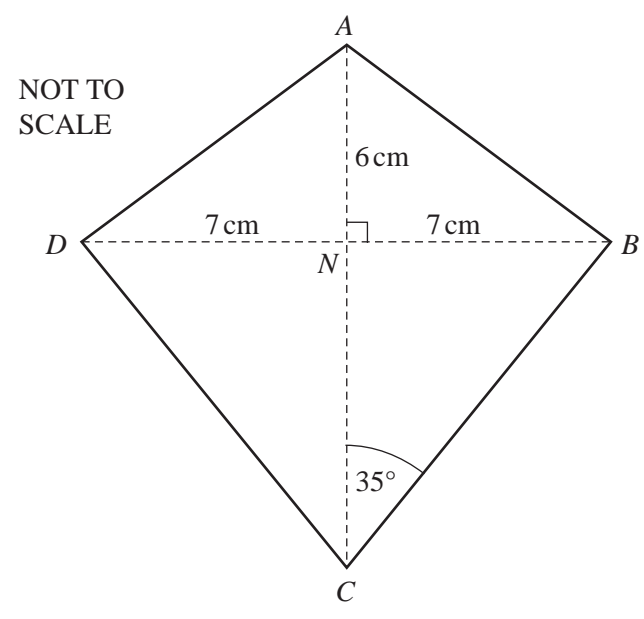
Answer(b)(ii) \$ [1]

(iii) Before the sale, he bought 5 tins at \$9.25 each.
Calculate how much he paid for these 5 tins.

Answer(b)(iii) \$ [1]

(iv) Use parts (b)(ii) and (b)(iii) to find the average (mean) price he paid for a tin of red paint.

Answer(b)(iv) \$ [3]



The diagram shows a kite $ABCD$, with $AB = AD$ and $DC = BC$.
 The diagonals AC and BD intersect at right angles at N .
 $AN = 6\text{ cm}$ and $NB = ND = 7\text{ cm}$.
 Angle $BCN = 35^\circ$.

(a) (i) What is the mathematical name for triangle BCD ?

Answer(a)(i) [1]

(ii) Complete the following statement.

Triangle BNC is congruent to triangle [1]

(iii) Write down the size of angle DCB .

Answer(a)(iii) Angle $DCB =$ [1]

(b) (i) Use trigonometry to calculate the size of angle NAB .

Answer(b)(i) Angle $NAB = \dots\dots\dots$ [2]

(ii) Calculate the length of AB .

Answer(b)(ii) $AB = \dots\dots\dots$ cm [2]

(c) Use trigonometry to calculate the length of BC .

Answer(c) $BC = \dots\dots\dots$ cm [3]

(d) Calculate the perimeter of the kite.

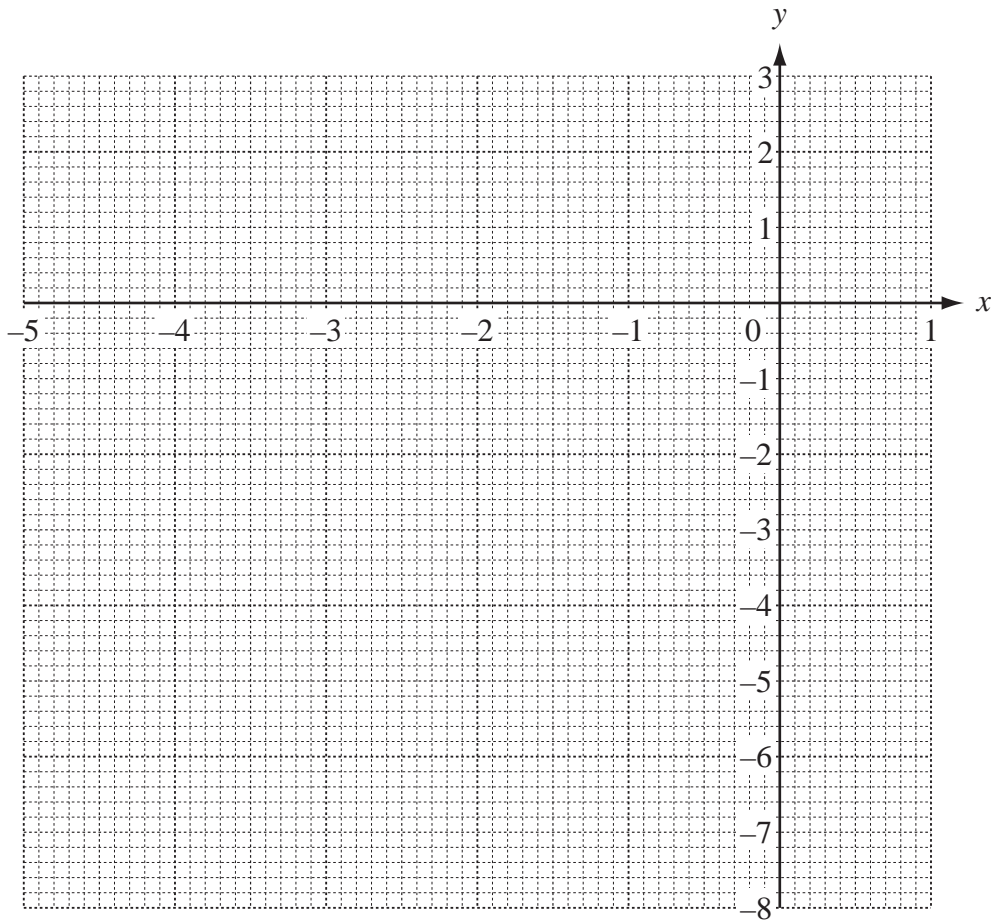
Answer(d) $\dots\dots\dots$ cm [2]

5 (a) Complete the table of values for $y = x^2 + 4x - 3$.

x	-5	-4	-3	-2	-1	0	1
y		-3		-7	-6	-3	

[3]

(b) On the grid below draw the graph of $y = x^2 + 4x - 3$ for $-5 \leq x \leq 1$.



[4]

(c) (i) Write down the co-ordinates of the lowest point of the graph.

Answer(c)(i) (..... ,) [1]

(ii) Write down the solutions of the equation $x^2 + 4x - 3 = 0$.

Answer(c)(ii) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

(d) (i) Mark the point $(-2, 1)$ on the grid and label it A .

(ii) Draw the straight line joining A to the point where the graph of $y = x^2 + 4x - 3$ cuts the y -axis. [1]

(iii) Find the gradient of your line.

Answer(d)(iii) [2]

(iv) Write down the equation of your line in the form $y = mx + c$.

Answer(d)(iv) $y =$ [2]

6 Ravinder scores x marks in a test.

(a) Manpreet scores 4 more marks than Ravinder.
Write down Manpreet's mark in terms of x .

Answer(a) [1]

(b) Tamsin scores 3 times as many marks as Ravinder.
Write down Tamsin's mark in terms of x .

Answer(b) [1]

(c) (i) Write down and simplify the total of the three marks in terms of x .

Answer(c)(i) [2]

(ii) The mean of these marks is 28. Show that $5x + 4 = 84$.

Answer (c)(ii)

[1]

(iii) Solve the equation $5x + 4 = 84$.

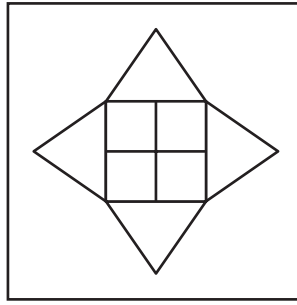
Answer(c)(iii) $x =$ [2]

(d) What mark did Tamsin score?

Answer(d) [1]

(e) Dinesh scored 63 marks out of 75.
Work out the mark Dinesh scored as a percentage.

Answer(e) % [2]



Peter makes square tiles, like the one shown above.

- (a) Write down the order of rotational symmetry of the tile.

Answer(a) [1]

- (b) On the diagram, draw all the lines of symmetry of the tile. [2]

- (c) Charles orders 2800 tiles from Peter at 1.75 euros (€) each.
He pays Peter €2300 now.
Calculate the amount he still has to pay.

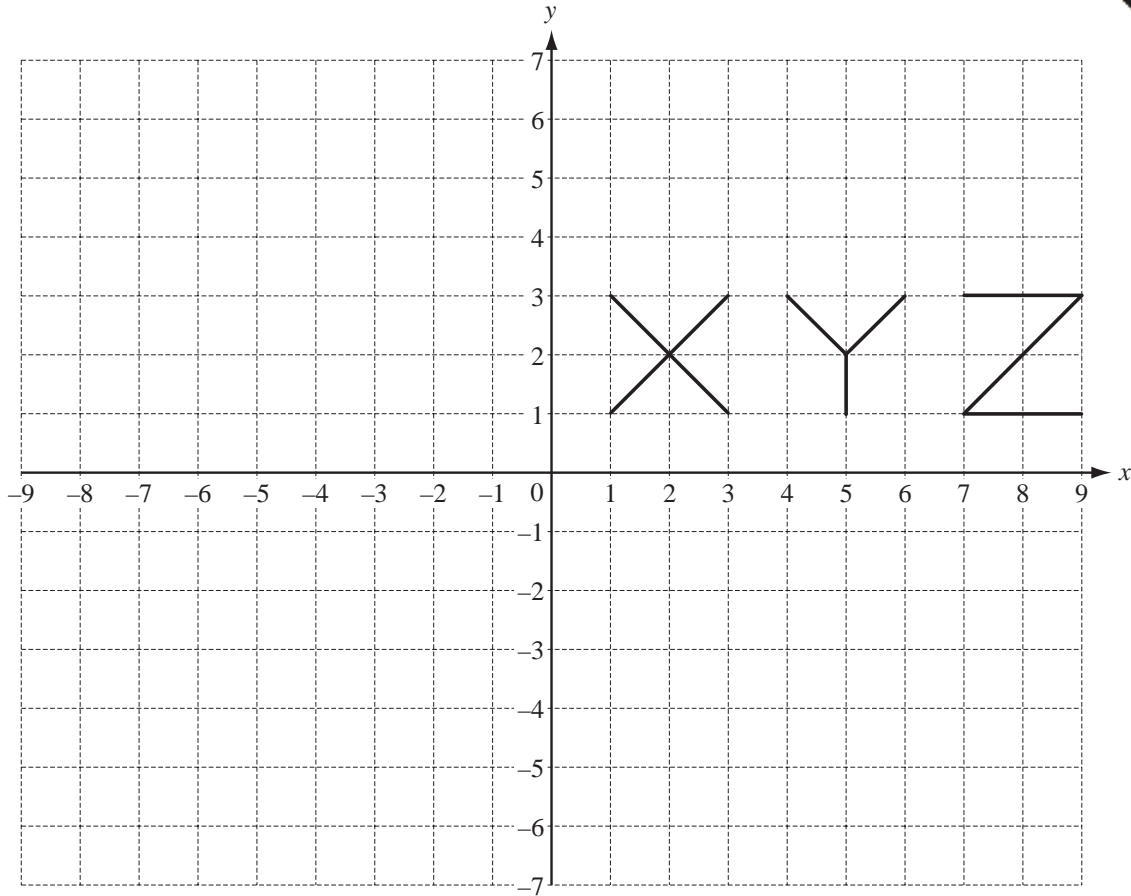
Answer(c) € [3]

- (d) Peter changes the €2300 into dollars (\$) when the exchange rate is €1 = \$1.348.
Calculate how many dollars Peter receives.
Give your answer correct to 2 decimal places.

Answer(d) \$ [2]

- (e) Peter borrows \$5000 from a bank at a rate of 9.2% per year **compound** interest.
Calculate the amount he owes after 2 years.
Give your answer correct to 2 decimal places.

Answer(e) \$ [3]



(a) On the grid,

(i) translate X by the vector $\begin{pmatrix} -7 \\ 2 \end{pmatrix}$, [2]

(ii) rotate Y through 90° anticlockwise about the origin. [2]

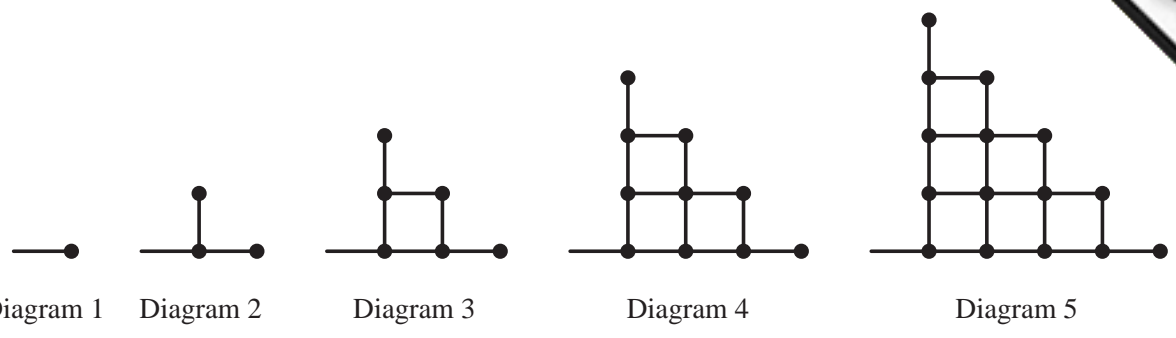
(b) (i) On the grid, reflect Z in the x-axis. This is the image Z_1 . [2]

(ii) On the grid, reflect the image Z_1 in the line $x = 4$. This is the image Z_2 . [2]

(iii) Describe a **single** transformation which maps the image Z_2 onto the original Z.

Answer(b)(iii) [2]

Question 9 is printed on the next page.



The diagrams show a pattern of lines and dots.

(a) Complete the table below.

Diagram number	1	2	3	4	5
Number of lines	1	3	7		
Number of dots	1	3	6		

[4]

(b) Work out the number of lines and the number of dots in Diagram 7.

Answer(b) Number of lines = , Number of dots = [2]

(c) The number of dots in Diagram n is $\frac{1}{2}n(n + 1)$.

(i) Use this formula to check your result for Diagram 5.

You must show your working.

Answer (c)(i)

[2]

(ii) How many dots are there in Diagram 20?

Answer(c)(ii) [2]

(d) The number of lines in Diagram n is $n^2 + kn + 1$.

Use the information about Diagram 3 from the table to calculate the value of k .

Answer(d) $k =$ [2]

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