

GCSE (9-1) Mathematics
J560/06 Paper 6 (Higher Tier)

Question Set 4

1

Amrit's income is 32% more than Bethan's income.
Amrit and Bethan's combined income is £54 868.

Calculate Amrit's income.

$$\text{Amrit} = 1.32 \times \text{Bethan}$$

$$A + B = 54\,868$$

$$1.32B + B = 54\,868$$

$$2.32B = 54\,868$$

$$B = 23650$$

$$A = 1.32 \times 23650$$

$$= \boxed{31218}$$

£ 31218 [5]

2

Jacob, Amelie and Reuben each roll a fair six-sided dice.
What is the probability that all three roll a number less than 3?

Give your answer as a fraction in its simplest form.

$$x < 3 = 1, 2 \quad p = \frac{2}{6}$$

$$\frac{2}{6} \times \frac{2}{6} \times \frac{2}{6} = \boxed{\frac{1}{27}}$$

..... $\frac{1}{27}$ [3]

3

The diagram shows two rectangles, A and B.



Rectangle A has a width of 25 cm and a height of 12 cm.
The width of rectangle B is three times the height of rectangle B.

The area of rectangle A is equal to the area of rectangle B.

Find the perimeter of rectangle B.

..... cm [5]

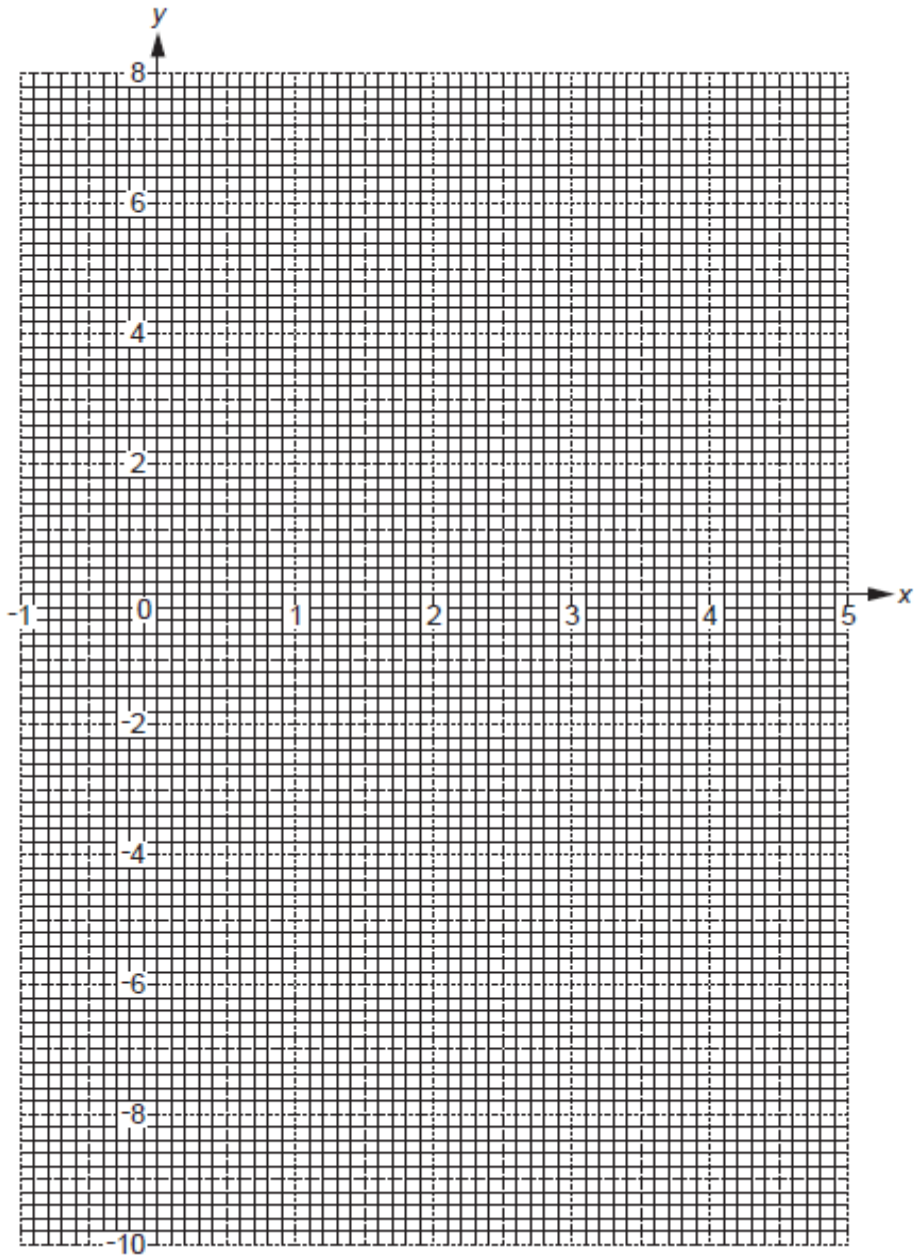
4 (a)

(a) Complete the table for $y = x^2 - 4x + 1$.

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

[2]

- 4 (b) Draw the graph of $y = x^2 - 4x + 1$ for $-1 \leq x \leq 5$.



[3]

- 4 (c) (c) On the same grid, draw the graph of $y = 2x - 6$ for $-1 \leq x \leq 5$.

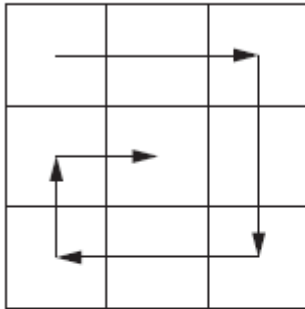
[3]

- 4 (d) (d) Use your graphs to solve the equation $x^2 - 4x + 1 = 2x - 6$.
Give your answers to 1 decimal place.

(d) $x = \dots\dots\dots$ or $x = \dots\dots\dots$ [2]

5 (a)

Nine consecutive numbers are written on a 3-by-3 grid. They are arranged, in ascending order, in a spiral as shown.



(a) Karen writes the numbers 3 to 11 on her grid.

3	4	5
10	11	6
9	8	7

The total of the first column is $3 + 10 + 9 = 22$.

Karen says

The total of the first column is one less than the total of the second column.

Show that this is correct for Karen's grid.

[1]

5 (b)

(b) Victor says

If **any** nine consecutive numbers are arranged in ascending order in this spiral on a 3-by-3 grid, the total of the first column will **always** be one less than the total of the second column.

Prove that Victor is correct.

[5]

6 (a) (a) Arron ran a distance of 5 km at an average speed of 2.2 m/s.

How long did Arron run for?

Give your answer in minutes and seconds, to the nearest second.

(a) minutes seconds [4]

6 (b) (b) Claudine cycled a distance of 53 km in 2.7 hours.

The distance is measured correct to the nearest km.

The time is given correct to 1 decimal place.

Calculate the lower and upper bounds of her average speed.

Give your answers correct to 2 decimal places.

(b) lower bound = km/h

upper bound = km/h [6]

7

Dani has a pack of 45 cards.
Each card is either red or black.

One-third of the cards in the pack are **red**.

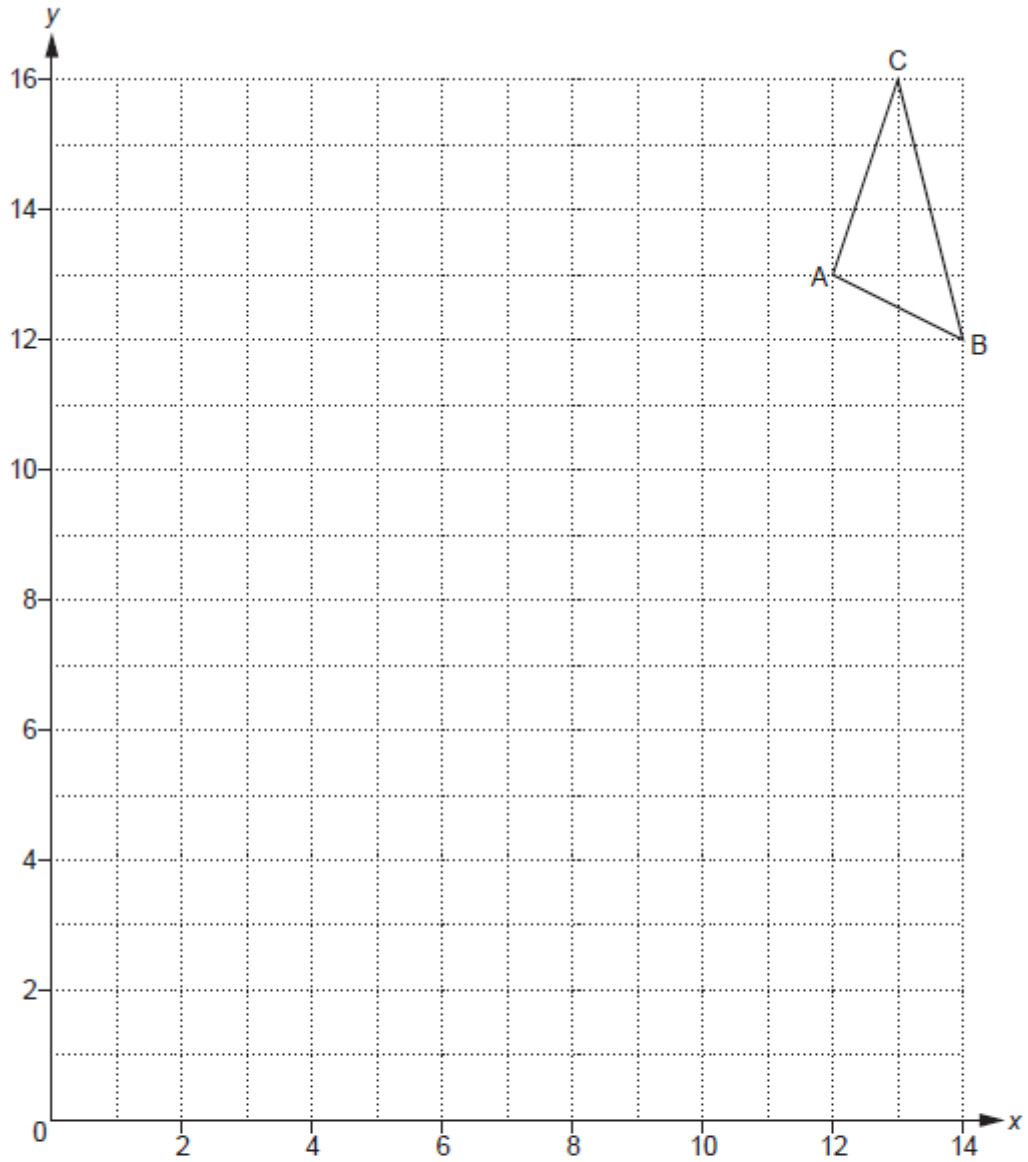
She picks two cards from the pack, without replacement.

Calculate the probability that Dani picks two **black** cards.

..... [5]

8 (a)

A triangle has vertices A, B and C.



The triangle is enlarged with scale factor f and centre of enlargement E.

Vertex A maps to (6, 7).

Vertex B maps to (2, 9).

(a) Find the coordinates of the centre of enlargement, E.

(a) (10 , 11) [2]

8 (b) (b) Find the scale factor, f .

(b) 2 [2]

8 (c) (c) Vertex C maps to the point R.
Find the coordinates of R.

(c) (..... 4 , 1) [2]

Total Marks for Question Set 4: 50

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