

**GCSE Mathematics - Paper 3 (Foundation tier)**  
**J560/03** Paper 3 Mathematics (Foundation Tier)

**Question Set 3**

1

(a) Here are some types of number.

An even number

An odd number

A prime number

A square number

A cube number

From the list, write down the type of number being described.

(i) A number that does **not** divide exactly by 2. An odd number ..... [1]

(ii) A number that has no factors except itself and 1. A prime number ..... [1]

(b) (i) Write down all the multiples of 4 between 21 and 29.

20 . 24, 28 .. 32

(b)(i) 24, 28 ..... [1]

(ii) Write down a common multiple of 4 and 6.

$$4 \times 6 = \underline{\underline{24}}$$

(ii) 24 ..... [1]

(c) Insert brackets to make this calculation correct.

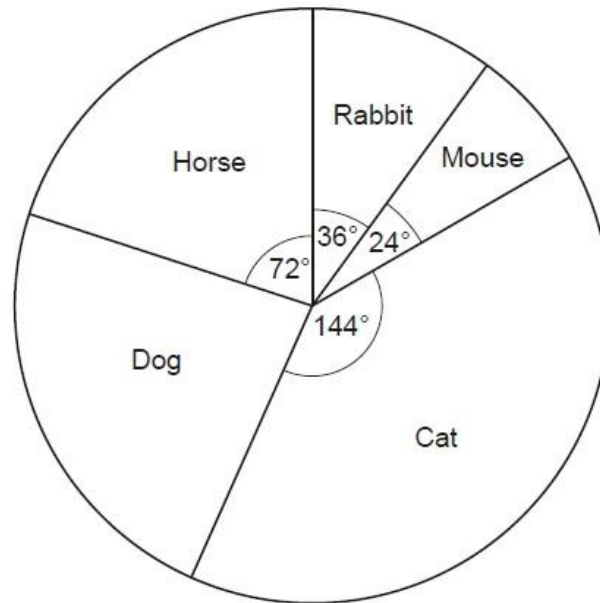
$$(4 - 1) \times 2 = 6 \quad 4 - 1 = 3 \quad 3 \times 2 = 6 \quad [1]$$

(d) Write 7% as a fraction.

$$7/100$$

(d) 7/100 ..... [1]

- 2 30 students each own one pet.  
The pie chart shows the proportion of each type of pet owned by the 30 students.



(a) Which type of pet is the mode?

mode = most

(a) Cat ..... [1]

Use the information in the pie chart to complete this bar chart

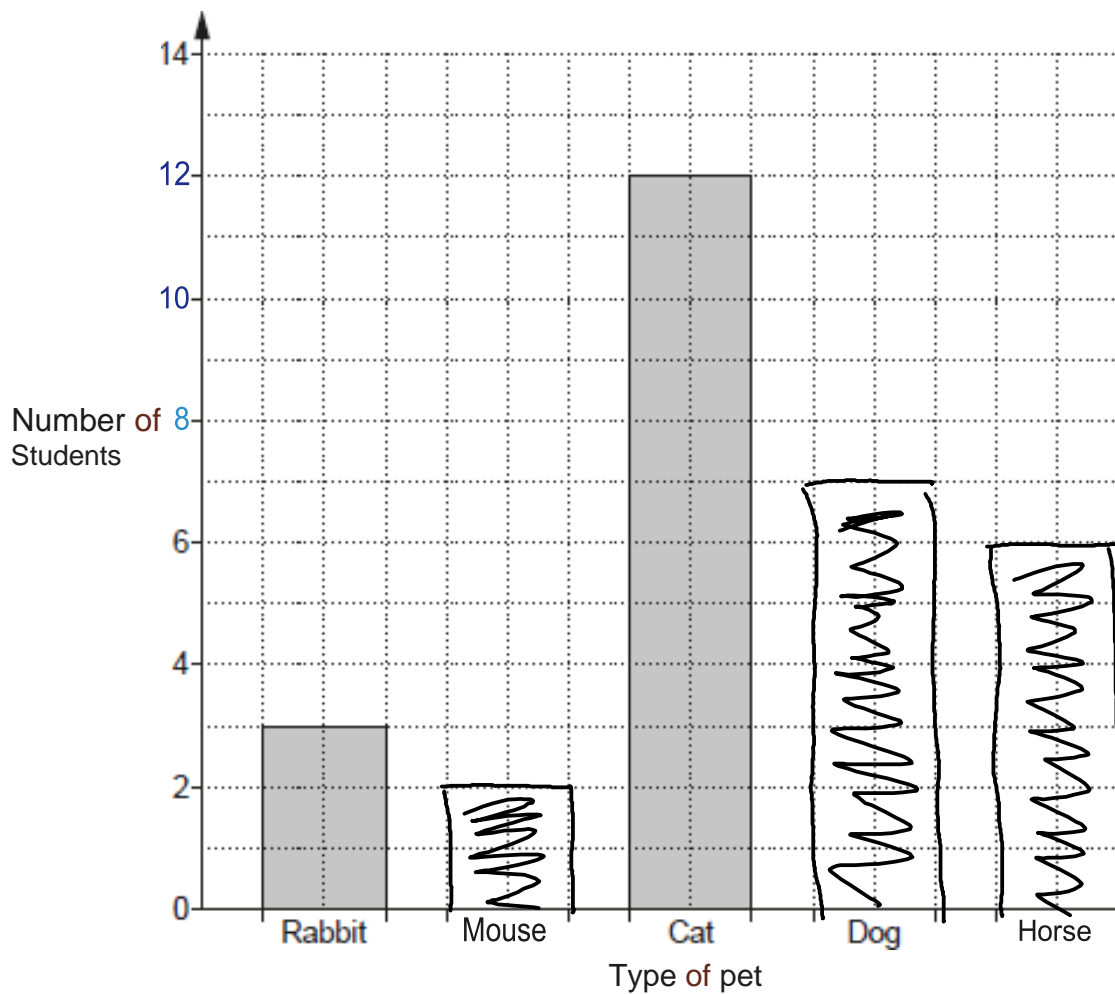
$$\text{cat} = 144^\circ = 12$$

$$\frac{144^\circ}{12} = 12 \quad \underline{\underline{\text{so } 1 = 12^\circ}}$$

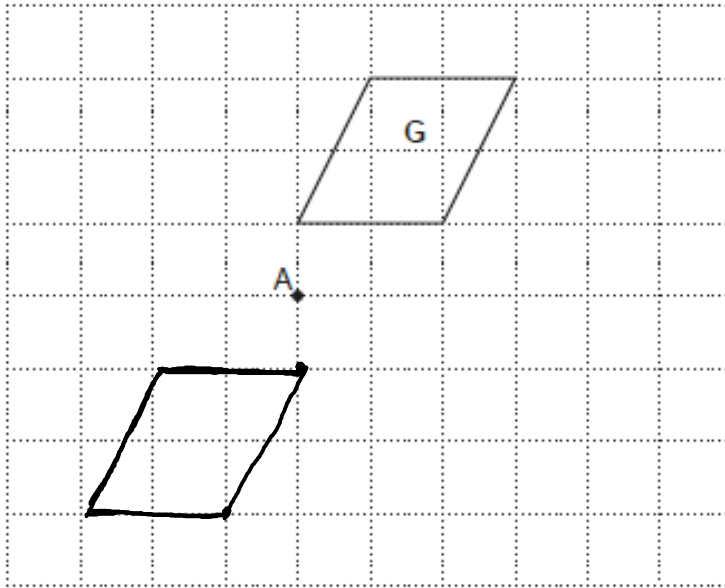
$$\text{Mouse} = 24^\circ = 2$$

$$\text{Horse} = 72^\circ = \frac{72}{12} = 6$$

$$\text{Dog} = 360^\circ - (72 + 24 + 36 + 144) = 84^\circ \rightarrow \frac{84}{12} = 7$$



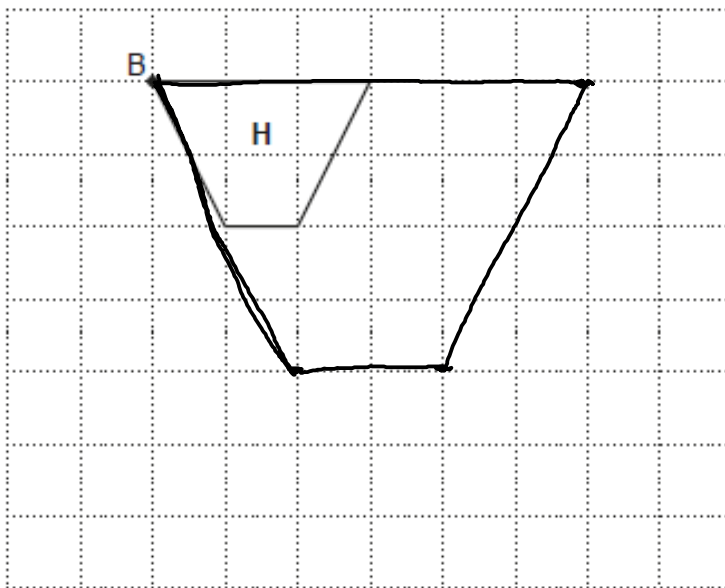
- 3 (a) Shape **G** is drawn on the grid.



Rotate shape **G** by  $180^\circ$  about the point **A**.

[2]

- (b) Shape **H** is drawn on the grid.



Enlarge shape **H** with scale factor 2 and the centre of enlargement at point **B**.

[2]

- 4 Tom buys a radio for £40.  
Later he sells it and makes a profit of 20%.

Tom says

The ratio of the price I paid for the radio to the price I sold the radio is 5 : 6.

Show that Tom is correct.

$$40 \times 1.2 = \underline{48 \text{ sell price}}$$

[3]

$$40 : 48 \xrightarrow{\div 8} \underline{\underline{5 : 6}}$$

- 5 Multiply out.

(a)  $3(x-2)$

$$3x - 6$$

(a) .....  $3x - 6$  ..... [1]

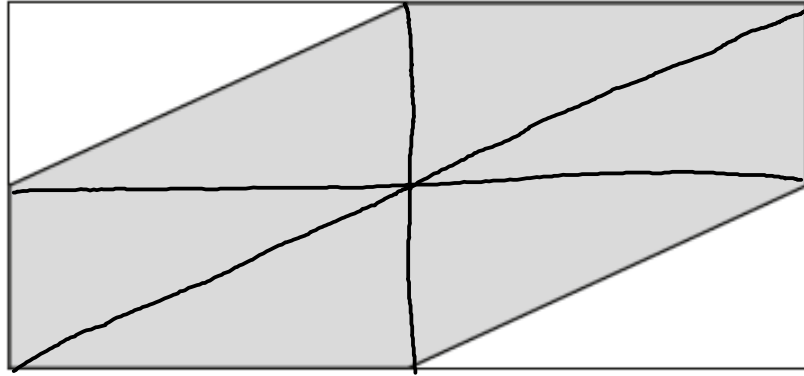
(b)  $2a(a+b)$

$$2a^2 + 2ab$$

(b) .....  $2a^2 + 2ab$  ..... [2]

6

The midpoints of the sides of a rectangle are joined by straight lines as shown.



Work out the percentage of the rectangle that is shaded.

Add your own lines like I have done above to make it easier. 2 lines from midpoint to midpoint.

And then split into triangles.

8 equal triangles and 6 are shaded  $\rightarrow \frac{6}{8} \times 100 = \underline{\underline{75\%}}$

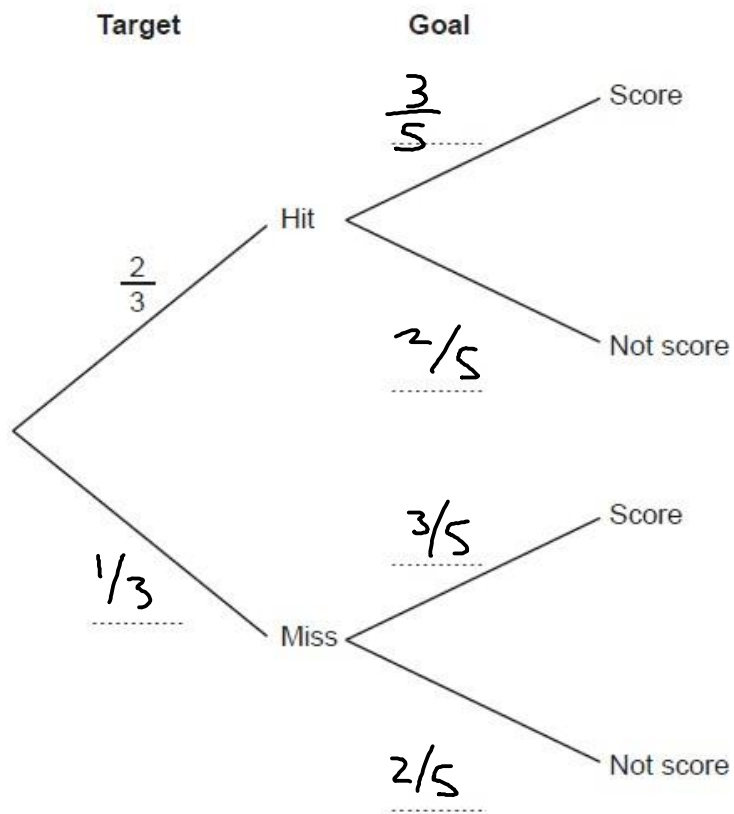
..... 75 ..... % [4]

7 Ryan shoots an arrow at a target. He then kicks a ball at a goal.

The probability that Ryan hits the target is  $\frac{2}{3}$ .

The probability that Ryan scores a goal is  $\frac{3}{5}$ .

(a) Complete the tree diagram.



[2]



(b) Find the probability that Ryan

(i) misses the target and does not score a goal,

$$1/3 \times 2/5 = \underline{\underline{2/15}}$$

(b)(i)  $\frac{2}{15}$  ..... [2]

(ii) either hits the target or scores a goal or both.

$$\begin{array}{l} \text{Hit, Not score} \\ \left( \frac{2}{3} \times \frac{2}{5} \right) + \text{Miss, Score} \left( \frac{1}{3} \times \frac{3}{5} \right) + \text{Hit, Score} \left( \frac{2}{3} \times \frac{3}{5} \right) = \\ \frac{4}{15} + \frac{3}{15} + \frac{6}{15} = \underline{\underline{\frac{13}{15}}} \end{array}$$

(ii)  $\frac{13}{15}$  ..... [2]

8 Solve the simultaneous equations.

$$\begin{aligned}2x - y &= 7 \\ 2x + y &= 5\end{aligned}$$

$$\begin{array}{r}2x - y = 7 \\ - \quad 2x + y = 5 \\ \hline 0 - 2y = 2 \\ \quad 2y = -2 \\ \quad \quad y = -1 \\ \quad \quad \underline{\underline{y = -1}}\end{array}$$

$$\begin{aligned}2x + y &= 5 \\ 2x + (-1) &= 5 \\ 2x &= 6 \\ \underline{\underline{x = 3}}\end{aligned}$$

$$x = \dots\dots\dots 3 \dots\dots\dots$$

$$y = \dots\dots\dots -1 \dots\dots\dots [3]$$

- 9 Two model cars, **A** and **B**, are in a race.  
They start together on the starting line.  
Assume each car travels at a constant speed.

Car **A** takes 30 seconds to complete each lap of the track.

Car **B** takes a whole number of seconds to complete each lap of the track.

The two cars next cross the starting line together 150 seconds after the start of the race.

Find the **four** possible times that car **B** could take to complete one lap.

You may find this information helpful.

$$\begin{aligned} 150 &= 2 \times 3 \times 5 \times 5 \\ 30 &= 2 \times 3 \times 5 \end{aligned}$$

$$2 \times 3 = 6$$

$$2 \times 5 = 10$$

$$3 \times 5 = 15$$

$$5 \times 5 = 25$$

..... 6 ..... 10 ..... 15 ..... 25 ..... seconds [5]

- 10 (a) Write down the multiplier for an increase of 140%.  
Give your answer as a decimal.

(a) ..... 1.40 ..... [1]

- (b) Ali invests £1500 in October.  
The investment increases in value by 10% in November.  
It then decreases in value by 20% in December.

Ali says

10% - 20% = -10%, so the £1500 has lost exactly 10% of its value.

- (i) Explain what Ali has done wrong.

He is using the original value of £1500  
to work out how much is lost. He needs [1]  
to do it in steps using the new values

- (ii) Work out the correct percentage loss. at each stage.

November 10% increase  $\rightarrow \pounds 1500 \times 1.1 = \underline{\pounds 1650}$

December 20% decrease  $\rightarrow \pounds 1650 \times 0.8 = \underline{\underline{\pounds 1320}}$

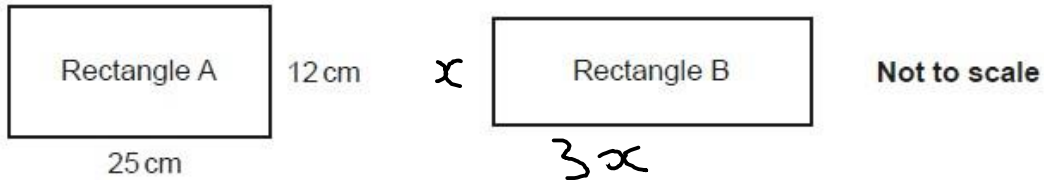
work out multiplier for overall loss.

$$\pounds 1500 \times m = \pounds 1320 \rightarrow \frac{\pounds 1320}{\pounds 1500} = \underline{\underline{0.88}}$$

so percentage loss = 88%

..... 88 ..... % [5]

- 11 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.

Rectangle B width =  $3x$       Rectangle B height =  $x$

Area A =  $12 \times 25 = 300 \text{ cm}^2$       Area B =  $3x \times x = 3x^2$

$300 = 3x^2 \rightarrow 100 = x^2 \rightarrow \underline{\underline{x = 10}}$

Perimeter B  $\rightarrow 3x + 3x + x + x = 8x = 8(10) = \underline{\underline{80 \text{ cm}^2}}$

..... 80 ..... cm [5]

**Total Marks for Question Set 3: 50**



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