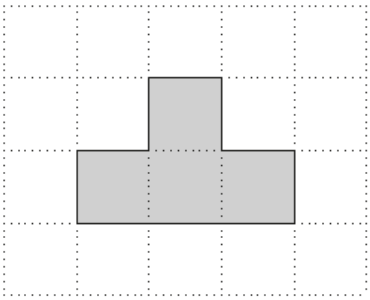
GCSE Mathematics - Paper 3 (Foundation tier)

J560/03 Paper 3 Mathematics (Foundation Tier)

Question Set 2

1 A shape is drawn on a one-centimetre grid.



(a) Find the perimeter of the shape.

$3 + 7(1) = 10$

(a) 10 cm **[1]**

(b) How many lines of symmetry does the shape have?

(b) 1 **[1]**

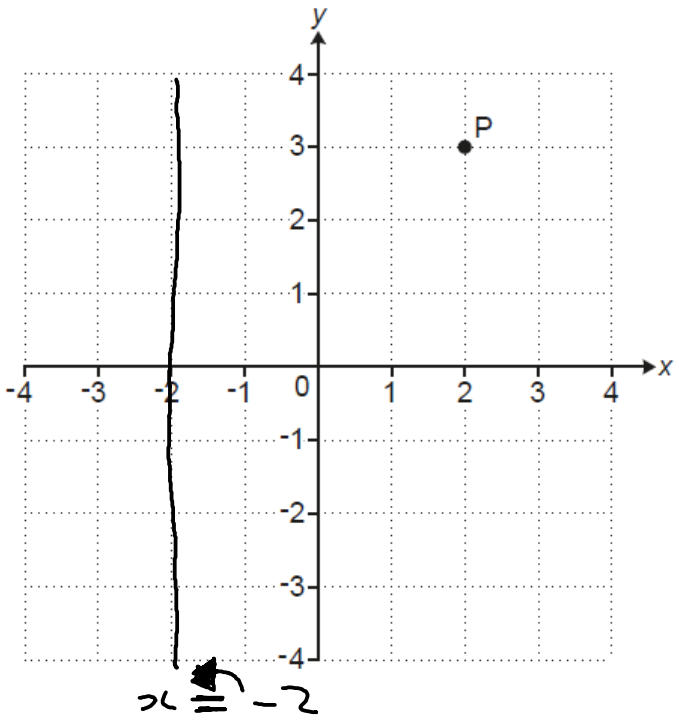
2 Insert brackets to make each of these calculations correct.

$5 \times (3 - 1) = 10$

$(3 + 6 - 2) \div 2 = 3.5$

[2]

3 Point P is shown on this grid.



(a) Write down the coordinates of point P.

(a) (2 , 3) **[1]**

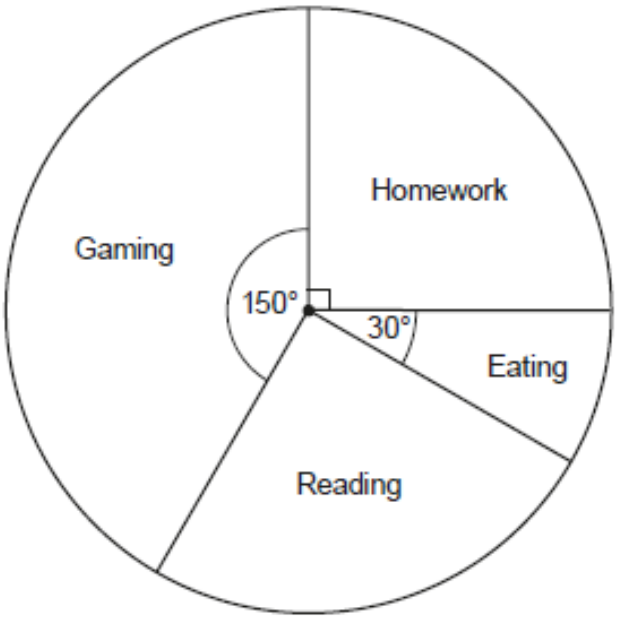
(b) Draw the line $x = -2$ on the grid. **[1]**

4 Find the value of $3g - h$ when $g = 4$ and $h = 5$.

$3(4) - 5 \Rightarrow 12 - 5 = 7$

7 **[2]**

5 The pie chart shows how Jack spent his time one evening.



(a) On which activity did Jack spend most time?

(a) Gaming **[1]**

(b) Jack says

I spent $\frac{1}{3}$ of my time on Gaming.

Show that he is not correct.

circle $= 360°$

He spent $150°$ $\rightarrow$ $\frac{150}{360} = \frac{5}{12} \neq \frac{1}{3}$

[2]

(c) The pie chart represents 5 hours.

Find the time, in hours and minutes, that Jack spent reading.

Whole circle $= 360°$ Reading $\rightarrow 360 - (150 + 90 + 30)$

$= 90°$

So Reading is $\frac{90}{360} \times 5 = 1.25$ hours

$= 1$ hour 15 minutes.

(c) 1 h 15 min **[4]**

6 Solve.

$4x + 5 = 35$

$4x + 5 = 35 \rightarrow 4x = 30$

$x = \frac{30}{4} = \frac{15}{2} = 7.5$

$x =$ 15/2 [2]

7 Delroy drives 240 miles.
His car averages 40 miles per gallon of petrol.
Petrol costs £1.30 per litre.

1 gallon is 4.5 litres.

How much does Delroy spend on petrol for this journey?

$\frac{240}{40} = 6$ gallons used $\quad 6 \times 4.5 = 27$ Litres used

$27 \times 1.30 = £35.10$

£ 35.10 [4]

8 **(a)** 50 sweets weigh 200g.

If each sweet weighs the same, work out the weight of 7 sweets.

$\frac{200}{50} \times 7 = 28$ grams

(a) ..... 28 ..... g **[2]**

(b) b is directly proportional to a.
b is 10 when a is 8.

Work out b when a is 9.

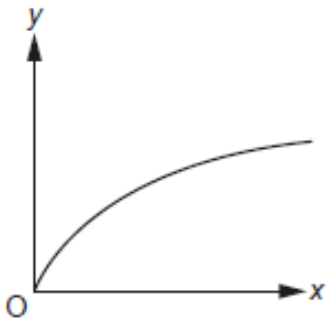
$b \propto a \rightarrow b = ka$

$10 = 8k \rightarrow \frac{10}{8} = k = 5/4$

$b = 9 \times 5/4 = \frac{45}{4} = 11.25$

(b) $b =$ ..... 45/4 ..... **[2]**

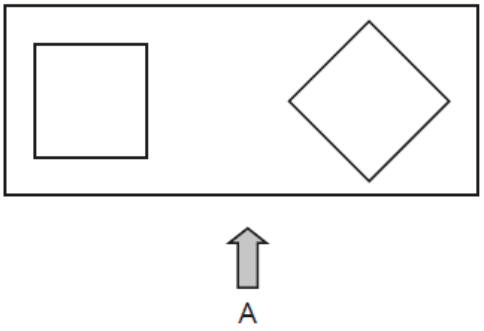
(c) A graph is drawn below.



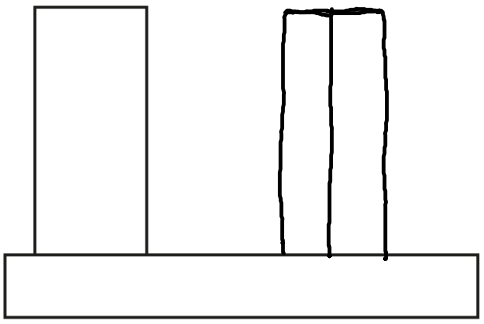
Explain how you know that y is not directly proportional to x.

..... A directly proportionate graph is a straight line passing through the origin (0,0). ..... **[1]**

9 This is the plan view of a 3D object.



Complete the diagram below to show the front view of the 3D object from A.



[2]

10 A grain of salt weighs 6.48×10^{-5} kg on average.
A packet contains 0.35 kg of salt.

(a) Use this information to calculate the number of grains of salt in the packet.

$$\frac{0.35}{6.48 \times 10^{-5}} = 5401.234568$$

$$= 5401 \text{ whole grains}$$

(a) 5401 **[2]**

(b) Explain why your answer to part **(a)** is unlikely to be the actual number of grains of salt in the packet.

It is based on an average weight
The weights of each grain is different
and would overall give a different
number of grains in packet if that is
taken into account. **[1]**

11 Sophie is organising a raffle.

- Each raffle ticket costs 50p.
- She sells 400 tickets.
- The probability that a ticket, chosen at random, wins a prize is 0.1.
- Each winning ticket receives a prize worth £3.

Sophie says

I expect the raffle to make over £100 profit.

Show that Sophie is wrong.

$400 \times 50p = 20{,}000p = £200$ income

$0.1 \times 400 = 40$ tickets will win prize.

$40 \times 3 = £120$ given away in prizes

Profit → $£200 - £120 = £80$

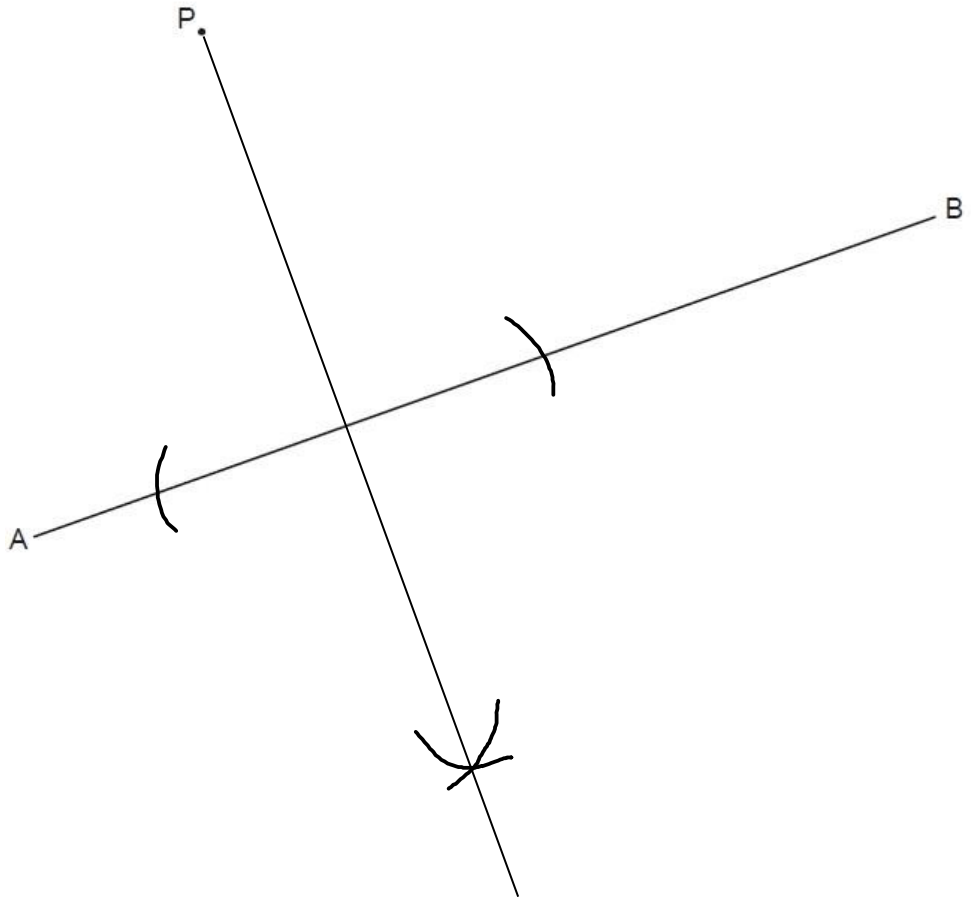
$£80 < £100$ → £80 is less than £100.

So Sophie is wrong.

.....

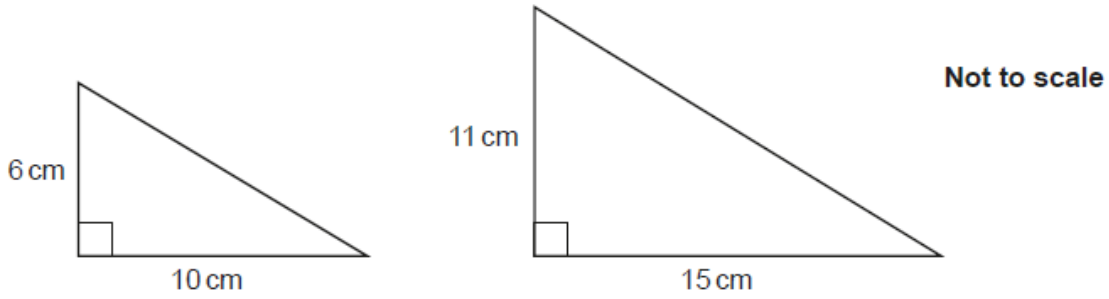
..... **[4]**

12 Construct the perpendicular from the point P to the line AB.
Show all of your construction lines.



[2]

13 Are these two triangles mathematically similar?
Show how you decide.



$15 \div 10 = 1.5$ = linear scale factor

$6 \times 1.5 = 9$ cm

so not similar as scale factor doesn't work.

No because one linear scale factor doesn't work for both triangles. For the shapes to be similar one scale factor has to work for all sides. [3]

14 (a) A number, g, is given as 4.05, correct to 2 decimal places.

Complete the error interval for g.

4.045
4.055

(a) $4.045 \leqslant g < 4.055$ [2]

(b) A number, h, is given as 3, truncated to 1 significant figure.

Complete the error interval for h.

(b) $3 \leqslant h < 3.5$ [1]

15 (a) Simplify.

(i) $h^3 \times h^{-3}$

$(3)+(-3)=0$

$h^0 = 1$

(a) (i) ..... 1 ..... [1]

(ii) $\frac{f^9}{f^3}$

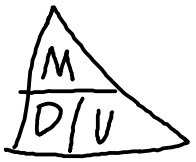
$9-3=6$

f^6

(ii) ..... f^6 ..... [1]

(b) The length of each side of a plastic cube is $2a$ millimetres.
The cube has mass $32a^2$ grams.

Find an expression for the density of the cube in its simplest form.
Give the units of your answer.



Density = mass ÷ volume

Volume of cube → $2a \times 2a \times 2a = 8a^3 mm^3$

$D - \frac{32a^2}{8a^3} = 4a^{-1}$

(b) density = ... $4a^{-1}$ .....

units ..... g/mm^3 ..... [5]

Total Marks for Question Set 2: 50

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