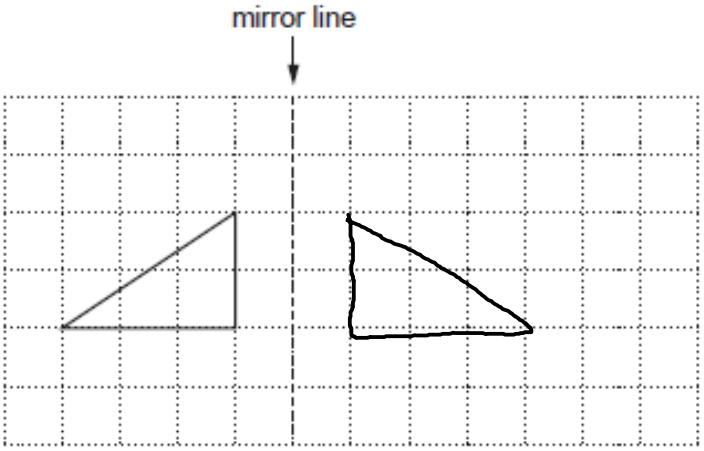
GCSE Mathematics - Paper 1 (Foundation tier)

J560/01 Paper 1 Mathematics (Foundation tier)

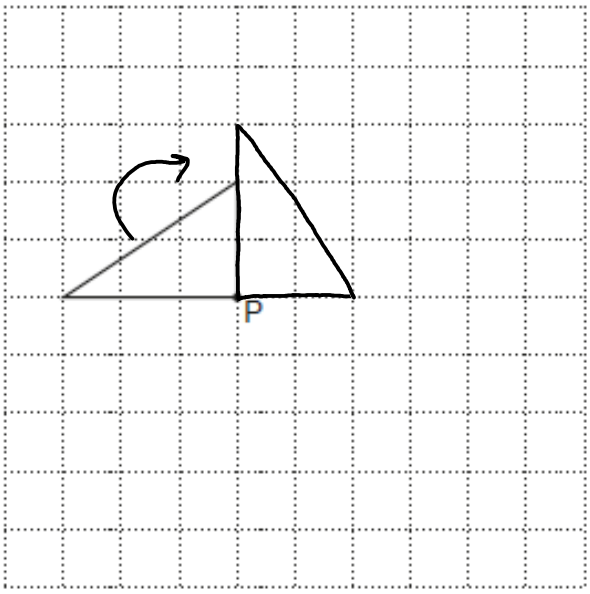
Question Set 6

1 **(a)** Reflect the triangle in the mirror line.



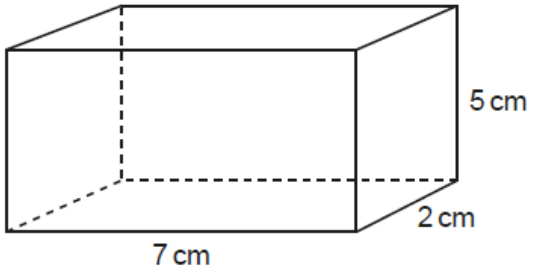
[2]

(b) Rotate the triangle 90° clockwise about the point P.



[2]

2 Work out the volume of this cuboid.



$7 \times 2 \times 5 = 70\,cm^3$

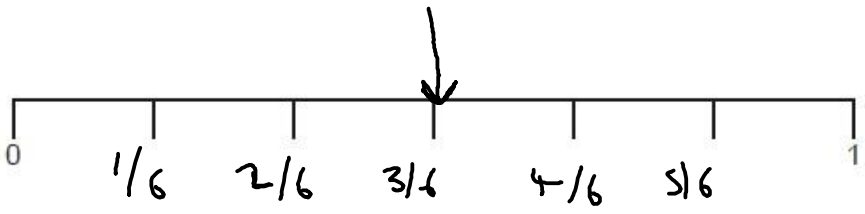
..... 70 ..... cm^3 **[2]**

3 A bag contains 12 counters.
6 are red, 4 are blue and 2 are yellow.
A counter is taken from the bag at random.

Mark with an arrow (↓) the probability the counter is

$\text{red} = \frac{6}{12} = \frac{1}{2}$

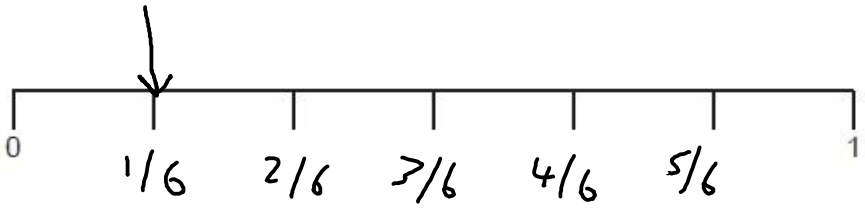
(a) red,



[1]

(b) yellow,

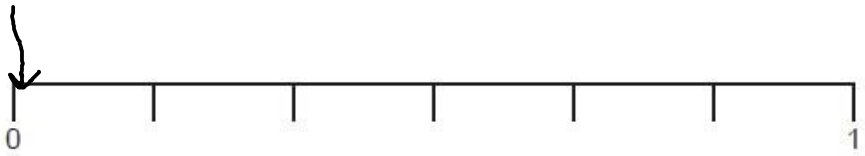
$\text{yellow} = \frac{2}{12} = 1/6$



[1]

(c) green.

no greens = 0



[1]

4 (a) Divide 72 in the ratio 4 : 5.

$4+5=9$ $\frac{72}{9}=8$ each part $4:5$ $(4\times8):(5\times8)$ $32:40$

(a) ..32.. : ..40.. [2]

(b) In one year, Clara and Dave borrowed books from a library in the ratio 3 : 7.
Dave borrowed 35 books.

Work out the number of books borrowed by Clara.

C : D
3 : 7
$(3\times5)=15:(7\times5)=35$

Dave 35 = 7 parts $\rightarrow \frac{35}{7}=5$ each part

(b) ..15.. [2]

5 Yoghurts are packed in trays.
Each tray holds 12 yoghurts.

What is the smallest number of trays needed to pack 460 yoghurts?

$\frac{460}{12}=38.\dot{3}$ so 39 trays needed.

..39.. [2]

6 The scale on a map is 1 : 50 000.

How many kilometres on the ground are represented by 8 cm on the map?

1 : 50000
map : ground
8 cm : 400,000 cm

400,000 cm → 4000 metres
= 4km

..... 4 ..... km [3]

7 Choose a word from this list that best describes each statement.

Identity Expression Formula Term Equation

(a) $8 = n + 2$ (a) ..... equation ..... [1]

(b) $3x + 2y$ (b) ..... expression ..... [1]

(c) $(a + b)(a - b) = a^2 - b^2$ (c) ..... Identity ..... [1]

8 Harry is paid £8.60 per hour for the first 30 hours he works each week.
After 30 hours he is paid $1\frac{1}{2}$ times the hourly rate.

Last week, Harry worked for 33 hours.
He was also paid a bonus of $\frac{1}{10}$ of his earnings for that week.

Calculate how much Harry was paid **in total** last week.

30 hours → $30 \times 8.60 = 258$

3 extra hours → $3 \times 8.60 \times 1.5 = 38.7$

$258 + 38.7 = £296.7$ earnings total

$\frac{1}{10} \times 296.7 = 29.67$ $29.67 + 296.7 = 326.37$

= total + bonus

£ 326.37 [6]

9 (a) Solve.

$\frac{x}{2} + 5 = 15$

$\frac{x}{2} + 5 = 15 \rightarrow \frac{x}{2} = 10 \rightarrow x = 20$

(a) $x =$ 20 [2]

(b) Factorise.

$5a^2 - 10a$ HCF $= 5a$

$5a(a-2)$

(b) $5a(a-2)$ [2]

(c) Solve by factorising.

$x^2 + 15x + 56 = 0$

Need two numbers to multiply for 56. $7 \times 8 = 56$
same two numbers to add up to 15. $7 + 8 = 56$

$(x+7)(x+8) = 0$

$x + 7 = 0 \rightarrow x = -7$

$x + 8 = 0 \rightarrow x = -8$

(c) $x =$ −7 or $x =$ −8 [3]

10 The height, h, of a lorry is 4.3 metres, correct to 1 decimal place.

Complete the error interval for the height, h.

4.35 = Upper bound
4.25 = Lower bound

4.25 $\leqslant h <$ 4.35 [2]

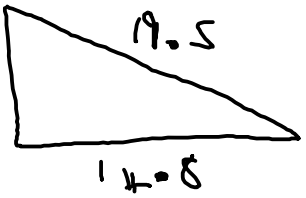
11 A triangle has sides of length 14.1 cm, 14.8 cm and 19.5 cm.

Is this a right-angled triangle?
Show how you decide.

If right angle triangle longest side is hypotenuse = 19.5 cm

$a^2 + b^2 = c^2$

$(14.1)^2 + (14.8)^2 = 417.85$



$417.85 = c^2$

$c = \sqrt{417.85} = 20.44$

$20.44 \neq 19.5$

So not right angle triangle.

No because the hypotenuse = 20.44 when according to $a^2 + b^2 = c^2$ the hypotenuse should be 19.5. [4]

12 One morning Kai records the colour of the cars passing his house.
He then works out the relative frequency of each colour.
Some of his results are shown in this table.

Colour	Silver	Red	Green	Black	Other
Relative frequency	0.18	0.16	0.10	0.24	0.32

The following morning, Kai is going to record the colour of the first 200 cars to pass his house.

Work out an estimate for the total number of cars, coloured silver or red, that he should expect to see.

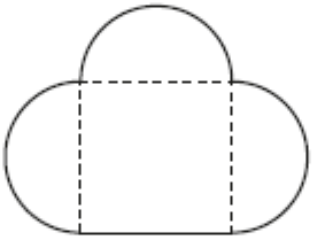
$1 - (0.16 + 0.10 + 0.24 + 0.32) = \text{Silver} = 0.18$

Silver + red $\rightarrow$ $0.18 + 0.16 = 0.34$

$0.34 \times 200 = 68$

68 [4]

13 The diagram shows Jane's lawn.
It is in the shape of a square of side 36 m and three semi-circles.



Not to scale

She is going to spread fertiliser on the lawn at a rate of 30 g per square metre.
The fertiliser is only sold in 10 kg bags costing £15.80 each.

Calculate the cost of buying the bags of fertiliser for her lawn.
You must show all your working.

Area → (3 × semi-circle) + (square)

Square area = $36 \times 36 = 1296\ m^2$

Semicircle area = $1/2\ \pi r^2 \rightarrow \frac{1}{2} \pi \times (18)^2 = 162\pi\ m^2$

Area = $(3 \times 162\pi) + (1296) = 2822.81403\ m^2$

Fertiliser needed → 30 × area = 84684.42089 grams

84684.42089 grams → kg = 84.684420 89 kg

84.68 ÷ 10 kg bags = 8.468...

So 9 bags needed → $9 \times 15.80 = £142.20$

£ 142.20 [6]

Total Marks for Question Set 6: 50