GCSE Mathematics - Paper 3 (Foundation tier)

J560/03 Paper 3 Mathematics (Foundation Tier)

Question Set 5

1 5 is a factor of 20.

(a) Write down another factor of 20.

$20 \div 5 = 4$

(a) 4 [1]

(b) Write down a multiple of 20.

20, 40, 60

(b) 40 [1]

2 **(a)** Complete the first seven square numbers.

1 4 9 16 25 36 49 [1]

(b) Write the missing term in each sequence.

(i) 18 16 14 12 10 8 [1]

(ii) 8 14 20 26 32 38 [1]

3 A teacher asks nine of his pupils how many pets they have at home.

Here are the results.

1 1 1 2 3 4 5 7 111

(a) Work out the range of the nine results.

111 − 1 = 110

(a) 110 **[1]**

(b) The median of the nine results is 3.
The mean is 15.

(i) Write down the mode.

(b)(i) 1 **[1]**

(ii) The teacher wants to use a sensible average to summarise the results.

Which average should he use and why?

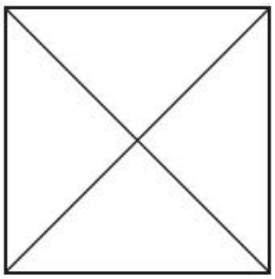
Mean because It is the highest average which takes into account the highest number 111. The other averages are too small. **[1]**

4 (a) The curved surface of a solid is made from this flat shape.

Write down the mathematical name of the solid.

(a) Cylinder [1]

(b) This is the plan view of a different solid.



Write down the mathematical name of the solid.

(b) Square-based Pyramid. [1]

5 **(a)** Work out 70% of 50.

$0.7 \times 50 = 35$

(a) 35 **[2]**

(b) Beth multiplies a number by 3 and divides the answer by 10.

By what fraction has the number been reduced?

Start with 10 $\rightarrow$ $10 \times 3 = 30$ $\rightarrow$ $\frac{30}{10} = 3$

So 10 to 3 $\rightarrow$ $10 \div x = 3$ $\rightarrow$ $\frac{10}{x} = 3$

$3x = 10 \rightarrow x = 10/3$

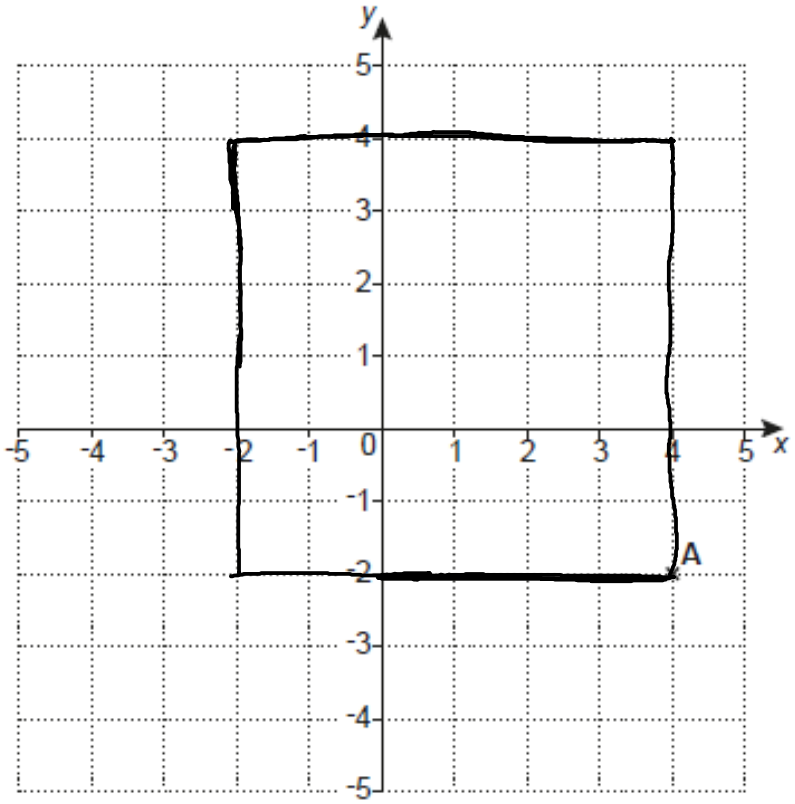
(b) 10/3 **[2]**

(c) Find a fraction which is bigger than $\frac{3}{7}$ and smaller than $\frac{4}{7}$.

$\frac{3.5}{7} = 1/2$

(c) 1/2 **[2]**

6 Point **A** is plotted at (4, -2) on this one-centimetre square grid.



Point **A** is a corner of a square with area $36\,cm^2$.
The other corners of the square have integer coordinates and lie on the grid.

Find the coordinates for the corner of the square that is diagonally opposite point **A**.
You may use the grid above to help you.

$\sqrt{36} = 6\,cm$ = each side = 6 square lengths

(..... -2 ..... , ... 4 .....) **[3]**

7 Sundip is going on holiday.
She wants to change £400 into euros(€).

Bank A will change her £400 into €452.

Bank B changed £250 into €280 for Sundip's friend.
It will use the same rate to change Sundip's £400 into euros.

At which bank will Sundip receive the most euros and by how many?
Show your working.

$\frac{€452}{£400} = 1.13$ rate so £1 = €1.13 → Bank A

$\frac{€280}{£250} = 1.12$ rate so £1 = €1.12 = Bank B

If sundip uses Bank A she will get £452
If sundip uses Bank B she will get £400 × 1.12 = £448

So Bank A will give more by 452 − 448 = €4

At Bank ...A..... Sundip will receive € ....4..... more **[5]**

8 **(a)** Complete the power of 2 for each statement by writing the missing value in the box.

(i) $2^3 \times 2^3 = 2^{\boxed{6}}$ $3+3=6$ **[1]**

(ii) $\frac{1}{32} = 2^{\boxed{-5}}$ $2^5=32$ so $2^{-5}=1/32$ **[1]**

(b) $2 \times 2^y = 1$.

Find the value of y.

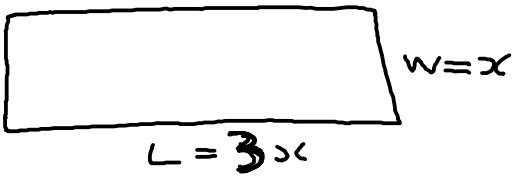
$2 \times 2^y = 1 \rightarrow 2^y = 1/2$

$2^1 = 2$ so $2^{-1} = 1/2$ $y=-1$

(b) $y =$ -1 **[2]**

9 A rectangle is three times as long as it is wide.
It has a perimeter of 44 cm.

Find the length of the rectangle.



Perimeter = $3x + 3x + x + x = 8x$

$8x = 44 \rightarrow x = 44/8 = 11/2 = 5.5$

Length $= 3x \rightarrow 3(11/2) = 33/2 = 16.5$ cm

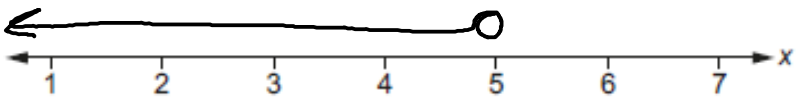
16.5 ..... cm [4]

10 Solve $3x + 4 < 19$.
Show your solution on the number line.

$3x + 4 < 19$

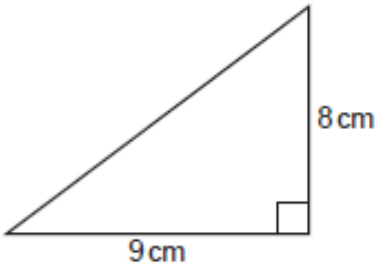
$3x < 15$

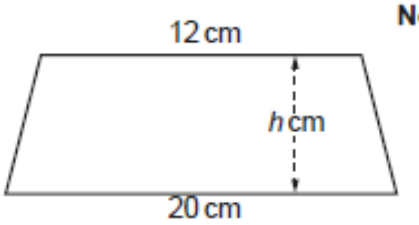
$x < 5$



[4]

11 The area of the triangle is equal to the area of the trapezium.





Not to scale

Calculate the height, h cm, of the trapezium.

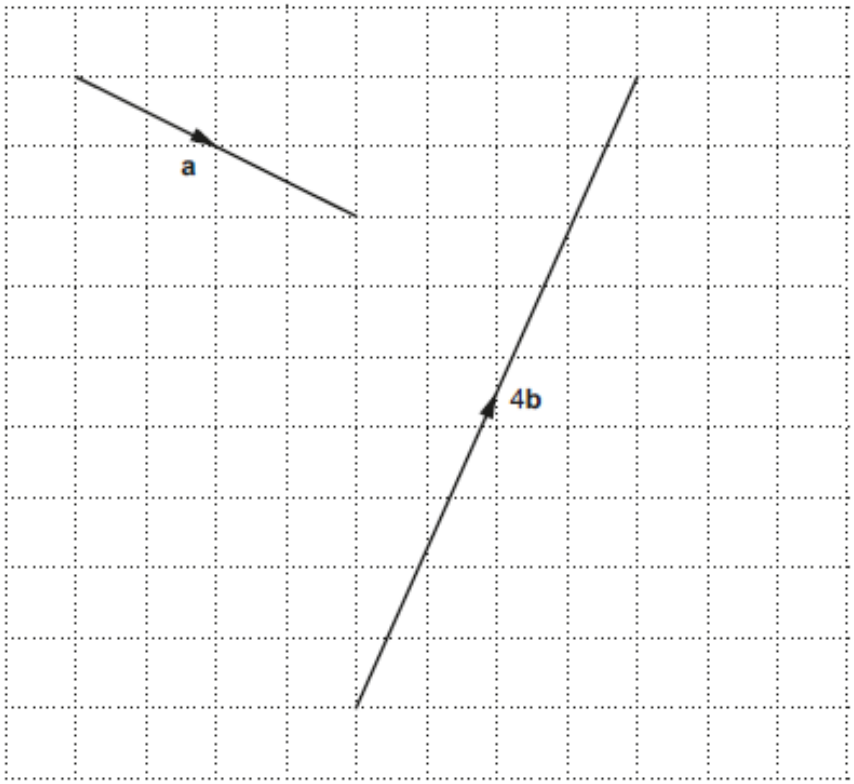
area of triangle is $1/2\,ab \rightarrow 1/2 \times 9 \times 8 = 36\ cm^2$

area of trapezium is $1/2(a+b)h \rightarrow 1/2(12+20)h = 16h\ cm^2$

$36 = 16h \rightarrow h = 36/16 = 9/4\ cm$

$h =$ 9/4 cm **[5]**

12 Vectors **a** and 4**b** are drawn on the grid.



(a) Write vector **a** as a column vector.

Right 4 Down 2

(a) $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$ **[2]**

(b) Find vector **b** as a column vector.

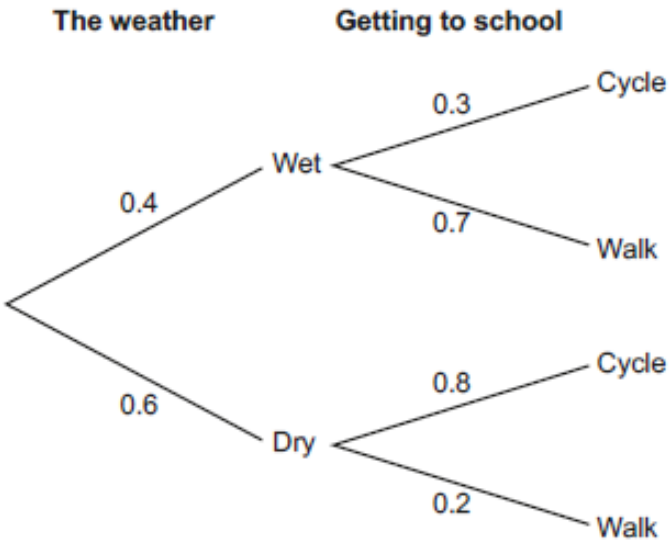
Right 4 up 9

(b) $\begin{pmatrix} 4 \\ 9 \end{pmatrix}$ **[2]**

13 The probability that Adam cycles to school or walks to school depends on the weather.

- On any day, the probability that the weather is wet is 0.4.
- When the weather is wet the probability that he cycles to school is 0.3.
- When the weather is dry the probability that he cycles to school is 0.8.

The information is shown on this tree diagram.



Work out the probability that

(a) it is dry and Adam walks to school,

$0.6 \times 0.2 = 0.12$

(a) ..... 0.12 ..... **[2]**

(b) Adam cycles to school.

$(0.3 \times 0.4) + (0.8 \times 0.6) = 0.6$

(b) ..... 0.6 ..... **[3]**

Total Marks for Question Set 5: 50