1. There are only red buttons, yellow buttons and orange buttons in a jar.
The number of red buttons, the number of yellow buttons and the number of orange buttons are in the ratio 7 : 4 : 9

Work out what percentage of the buttons in the jar are orange.

7 : 4 : 9
r : y : o

$7 + 4 + 9 = 20$

$\frac{9}{20} \times 100 = \frac{900}{20} = \frac{90}{2} = 45\%$

46 %

(Total for Question is 2 marks)

2. Harry, Regan and Kelan share £450 in the ratio 2 : 5 : 3

How much money does Kelan get?

2 : 5 : 3

H : R : K

$45 \times 3 = 135$

$2 + 5 + 3 = 10$

$\frac{450}{10} = 45$

£ 135

(Total for Question is 2 marks)

3. Kiaria is 7 years older than Jay.
Martha is twice as old as Kiaria.
The sum of their three ages is 77

Find the ratio of Jay's age to Kiaria's age to Martha's age.

Let x be Jay's age

Jay $= x$
Kiaria $= x + 7$
Martha $= 2(x+7)$
$= 2x + 14$

$x + x + 7 + 2x + 14 = 77$
$4x + 21 = 77$
$4x = 56$
$x = 14$

J : K : M

$x : x + 7 : 2x + 14$

$14 : 14 + 7 : 2(14) + 14$

$14 : 21 : 42$

14 : 21 : 42

(Total for Question is 4 marks)

4. Annie and Lily share some money in the ratio 4 : 3

(a) What fraction of the money does Lily get?

Annie : Lily
4 : 3

4 + 3 = 7

$\frac{3}{7}$ ✓

(1)

Rosie and Dan share some sweets.

Dan gets $\frac{1}{4}$ of the sweets.

(b) Write down the ratio of the number of sweets Rosie gets to the number of sweets Dan gets.

Dan gets $\frac{1}{4}$
Rosie gets $\frac{3}{4}$

Rosie : Dan
$\frac{3}{4}$: $\frac{1}{4}$
(×4) (×4)
3 : 1

3 : 1 ✓

(1)

(Total for Question is 2 marks)

Prime number is number divisible by only itself and 1

10 to 20
11
13
17
19
= 4

20 to 30
23
29 ✓
= 2

No, Steve is not correct because there are 4 prime numbers between 10 and 20, but only 2 between 20 and 30 ✓

5. The table shows a cricket club's income in 2016 from a fete, a quiz and membership fees.

	Income	
Fete		£250
Quiz	Entry fees Refreshments	13 at £5 each £35
Membership fees		25 at £20 each

Express as a ratio

the income from the fete to the income from the quiz to the income from membership fees.

Give your ratio in its simplest form.

Fete = £250

Quiz = 13 × 5 + 35
= £100

Membership fees = 25 × 20
= £500 ✓

Fete : Quiz : Membership Fees

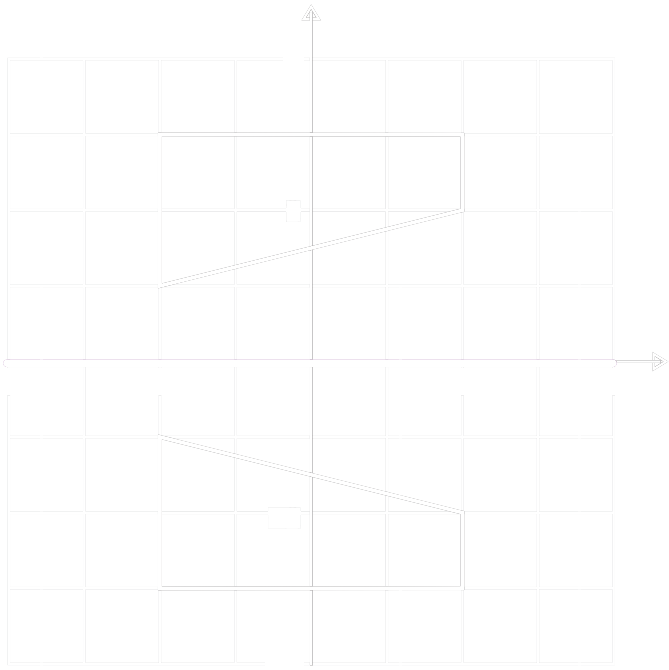
250 : 100 : 500 ✓

(÷50) (÷50) (÷50)

5 : 2 : 10

5 : 2 : 10 ✓

(Total for Question is 3 marks)



Reflection in the x-axis ✓

6. The ratio of the cost of one metre of cotton fabric to the cost of one metre of silk fabric is 2 : 5

Complete the table of costs.

Cotton : Silk
2 : 5

2 : 5
↓ ×3 ↓
6 : 15 ← Price of 2m

Cotton
2m costs £6
(÷2) (÷2)
1m costs £3

3 × 6 = £18
3 × 8 = £24
3 × 9 = £27

Silk
2m costs £15
(÷2) (÷2)
1m costs £7.50

6 × 7.50 = £45
8 × 7.50 = £60
9 × 7.50 = £67.50

	2 m	6 m	8 m	9 m
cotton fabric	£6	£18	£24	£27 ✓
silk fabric	£15	£45	£60	£67.50 ✓✓

(Total for Question is 3 marks)

7. There are some chocolates in a box.

$\frac{1}{4}$ of the chocolates contain nuts.

The rest of the chocolates do not contain nuts. $\frac{3}{4}$ of the chocolates

$1 - \frac{1}{4} =$ rest

Write down the ratio of the number of chocolates that contain nuts to the number of chocolates that do not contain nuts.

Give your answer in the form $1 : n$

nuts : no nuts

contain nuts

$1 - \frac{1}{4} = \frac{3}{4}$

The Rest` donot contain nuts

As we want the ratio in the form 1:n

nuts : no nuts

$\frac{1}{4} : \frac{3}{4}$ ×4

$1 : 3$

$n = 3$

1 : 3

(Total for Question is 2 marks)

8. In a village

the number of houses and the number of flats are in the ratio 7 : 4
the number of flats and the number of bungalows are in the ratio 8 : 5

There are 50 bungalows in the village.

How many houses are there in the village?

houses : flats
7 : 4 This ratio can be scaled up by a factor of 2
flats : bungalows
8 : 5
x2 x2
14 : 8 : 5 (1)
houses : flats : bungalows

houses : bungalows
14 : 5

Scale the ratio up by a factor of 10 to calculate how many houses there are when there are 50 bungalows.

x10 14 : 5 x10
140 : 50 (1)

Number of houses when there are 50 bungalows

140 (1)

(Total for Question is 3 marks)

9. Alan, Bispah and Chan share a sum of money.

Alan gets $\frac{1}{8}$ of the money.

Bispah gets $\frac{1}{2}$ of the money.

Chan gets the rest of the money.

Alan gets £2.50

(a) Work out how much money Bispah gets.

Alan gets $\frac{1}{8}$ of the total. Alan gets £2.50

$\frac{1}{8}t = £2.50$ t = total money

$\times 8$ $\times 8$

$t = 2.50 \times 8$ (1)

$t = £20$

Bispah gets $\frac{1}{2}$ of the total (t)

$B = \frac{1}{2}t = \frac{1}{2} \times 20$

$= £10$

£ 10 (1)

(2)

(b) Find the ratio

amount of money Alan gets : amount of money Chan gets

Give your answer in the form $a : b$ where a and b are whole numbers.

$A = £2.50$ $t = £20$

$B = £10$

Chan's Share:

$C = 20 - 10 - 2.50 = 7.50$ (1)

Alan : Chan

$\div 2.50$ £2.50 : £7.50 $\div 2.50$ (1)

1 : 3

← we need a ratio with whole numbers

1 : 3 (1)

(3)

(Total for Question is 5 marks)

10. Azmol, Ryan and Kim each played a game.

Azmol's score was four times Ryan's score.
Kim's score was half of Azmol's score.

Write down the ratio of Azmol's score to Ryan's score to Kim's score.

Azmol : Ryan : Kim

Let x be Ryan's score

$R = x$
$A = 4x$
$K = \frac{1}{2}A$

$K = \frac{1}{2}(4x)$
$= 2x$ ✓

$4x : x : 2x$
$(\div x)$
$4 : 1 : 2$

4 : 1 : 2 ✓

(Total for Question is 2 marks)

1km = 1000m
×4 ×4
4km = 4000m

4000 ✓

11. Here is a grid of squares.

1	2	3	5
1	2	3	4

Write down the ratio of the number of shaded squares to the number of unshaded squares.

shaded : unshaded
3 : 5

3 : 5 ✓

(Total for Question is 1 mark)

w = 4(8) + 3 ✓
w = 32 + 3
w = 35

35 ✓

12. In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	red	blue	green	yellow
Probability	0.4	0.15	0.2	0.25

= 1

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

probability of blue or green

$1 - (0.4 + 0.25)$

$= 1 - 0.65$

$= 0.35$

probability of blue

$\frac{3}{7} \times 0.35 = 0.15$

probability of green

$= 1 - (0.4 + 0.15 + 0.25)$

$= 1 - 0.8$

$= 0.2$

(Total for Question is 4 marks)

13. (a) A bag contains red counters and blue counters only.

number of red counters : number of blue counters = 3 : 4

Write down the fraction of the counters that are red.

↳ $\frac{\text{Number of red}}{\text{Number of counters}} = \frac{3}{3+4} = \frac{3}{7}$

3/7 ✓

.....

(1)

(b) Write the ratio 12 : 30 in the form 1 : n

$n = \frac{30}{12} = 2.5$ ✓

÷12 (12 : 30 / 1 : n) ÷12

```
   2.5
12 | 30
     24
     60
     60
      0
```

1 : 2.5 ✓

.....

(2)

(Total for Question is 3 marks)

14. Jamil makes a drink by mixing
1 part of orange squash with 9 parts of water.

He uses 750 millilitres of orange squash.

Jamil is going to put the drink he has mixed into 1 litre bottles.

Work out the greatest number of 1 litre bottles that Jamil can completely fill.

↳1000ml

① how much water is used: OS : water

×750 ↓ 1 : 9 ↓ ×750 → ? = 9×750ml

750ml : 6750ml ✓

$750 \times 9 = 6750$

② how much fluid/juice there is:

Total volume = Vol(OS) + Vol(water) = 750ml + 6750ml
= 7500ml ✓

$6750 + 750 = 7500$

③ how many bottles.

1 bottle → 1000 ml

×7.5 ↓ 7.5 bottles → 7500 ml ↓ ×? = $\frac{7500}{1000}$ = 7.5×

↳ round down to 7 as not enough for 8.

.......7 bottles ✓.......

(Total for Question is 3 marks)

15. Adam, Linda and Rytis share an amount of money.

Linda gets three times as much money as Rytis gets. → $L = 3R$

Linda gets half as much money as Adam gets. → $L = \frac{1}{2}A$

What fraction of the amount of money does Linda get?

1er $R = 1$ → $L = 3$

→ $A = 6$

ratio $A : L : R$

$6 : 3 : 1$ ✓1

fraction for Linda $= \frac{3}{6+3+1} = \frac{3}{10}$

$3/10$ ✓2

.....

(Total for Question is 2 marks)

16. Pens and pencils are sold in a shop.

12 pencils cost £1.80

The ratio of the cost of a pen to the cost of a pencil is 7 : 3

Work out the cost of 5 pens.

12 pencils → £1.80

1 pencil → $\frac{£1.80}{12}$ = £0.15 ✓1

Pen : Pencil

7 : 3

×0.05 ↓ ×? → ? = $\frac{0.15}{3}$ = 0.05 ✓2

£0.35 : £0.15

✓3

5 pens = 5 × £0.35

= £1.75

£ 1.75 ✓4

(Total for Question is 4 marks)

17. Carlo puts tins into small boxes and into large boxes.

He puts 6 tins into each small box. → Num small box $= \frac{1200}{6} = 200$
He puts 20 tins into each large box. → Num large box $= \frac{1800}{20} = 90$ ✓3

Carlo puts a total of 3000 tins into the boxes so that

number of tins in small boxes : number of tins in large boxes = 2 : 3

Carlo says that less than 30% of the boxes filled with tins are large boxes.

Is Carlo correct?
You must show all your working.

1 share $= \frac{3000}{2+3} = 600$ ✓1

Small : large
2 : 3
1200 : 1800 ✓2

finding number of large boxes as a proportion of number of total boxes.

$= \frac{90}{200+90} = 0.3103\ldots \rightarrow 31\%$ (2.s.f). ✓4

31% > 30% ∴ Carlo is wrong. ✓5

(Total for Question is 5 marks)