

R15a Ratio Sharing an amount

OCR

- 5 (a) Two numbers are in the ratio 5 : 7.
The difference between the numbers is 12.

Work out the two numbers.

(a)and.....[2]

- (b) Three numbers have a mean of 9 and a mode of 7.

Work out the three numbers.

(b).....and.....and.....[2]

5 (a) Two numbers are in the ratio 5 : 7.
The difference between the numbers is 12.

Work out the two numbers.

2 parts = 12
1 part = 6

5 : 7
↙ x6 ↘ x6

(a) 30 and 42 [2]

(b) Three numbers have a mean of 9 and a mode of 7.

Work out the three numbers.

most

14 13

7 7 ?
27
add up

3 = 9

(b) 7 and 7 and 13 [2]

- 10 (a) A bag contains only green counters and black counters in the ratio 2 : 7.
There are 45 counters in the bag.

How many counters are black?

(a) [2]

- (b) A different bag contains only red counters, blue counters and yellow counters in the ratio
4 : 6 : 11.

There are 54 blue counters.

- (i) How many counters are red?

(b)(i) [2]

- (ii) A counter is taken at random from the bag.

What is the probability that it is yellow?

(ii) [1]

- (c) A different bag contains only purple counters and orange counters in the ratio $x : y$.
A counter is taken at random from the bag.

Complete the following statement with an algebraic expression.

The probability that this counter is purple is..... .

[2]

- 10 (a) A bag contains only green counters and black counters in the ratio 2 : 7.
There are 45 counters in the bag.

How many counters are black?

$45 = 9 \text{ parts}$
 $5 = 1 \text{ part}$

$G : B$
 $2 : 7$
 $\downarrow \quad \downarrow \times 5$
 $10 \quad 35$

(a) 35 [2]

- (b) A different bag contains only red counters, blue counters and yellow counters in the ratio 4 : 6 : 11.

There are 54 blue counters.

- (i) How many counters are red?

$R : B : Y$
 $4 : 6 : 11$
 $\times 9 \checkmark$
 $4 \times 9 = 36 \checkmark$

$54 = 6 \text{ parts}$
 $9 = 1 \text{ part}$

(b)(i) 36 [2]

- (ii) A counter is taken at random from the bag.

What is the probability that it is yellow?

$\frac{11}{21}$

$21 \dots 4 + 6 + 11$

(ii) [1]

- (c) A different bag contains only purple counters and orange counters in the ratio $x : y$.
A counter is taken at random from the bag.

Complete the following statement with an algebraic expression.

The probability that this counter is purple is..... $\frac{x}{x+y}$ [2]

P : O

X : Y

$$\frac{x}{\text{total}}$$

12 (a) Three schools provide this information.

- $\frac{3}{7}$ of the pupils at Harwood are girls.
- 42% of the pupils at Crompton are girls.
- The ratio of girls to boys at Astley is 4 : 5.

Write the schools in the order of their proportion of girls, lowest to highest.
Show how you reached your answer.

(a) [4]
lowest

12 (a) Three schools provide this information.

- $\frac{3}{7}$ of the pupils at Harwood are girls.
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- The ratio of girls to boys at Astley is 4 : 5.

Write the schools in the order of their proportion of girls, lowest to highest.

Show how you reached your answer.

<u>Harwood</u>	Crompton	Astley
$\frac{3}{7}$	42%	$\frac{4}{9}$
0.428	0.42	0.444...

(a) Crompton Harwood Astley [4]
 lowest

17 Adil, Katie and Rebecca share £160 in the ratio 2 : 5 : 3.

(a) How much does Rebecca receive?

(b) Katie says she receives 60% more than Rebecca.
Here is her reasoning.

I receive 5 parts and Rebecca receives 3 parts.

$$\frac{3}{5} = 60\%$$

So I receive 60% more than Rebecca.

(i) Explain what is wrong with Katie's reasoning.

.....
..... [1]

17 Adil, Katie and Rebecca share £160 in the ratio ^{A K R} 2 : 5 : 3.

(a) How much does Rebecca receive?

£160 = 10 parts
£16 = 1 part

3 x £16 = £48

(b) Katie says she receives 60% more than Rebecca. Here is her reasoning.

I receive 5 parts and Rebecca receives 3 parts.

$\frac{3}{5} = 60\%$

So I receive 60% more than Rebecca.

5 : 3

(i) Explain what is wrong with Katie's reasoning.

$\frac{2}{3}$ hasn't looked at the difference between both [1]

19 The population of a village is in the following ratios.

Video created by W Neill

- men : children = 11 : 3
- women : children = 5 : 2

(a) Find the ratio men : women.
Give your answer in its simplest form.

(a) : [2]

(b) There are 36 children in the village.

Find the total population of the village.

(a) : [2]

(b) [3]

19 The population of a village is in the following ratios.

Video created by W Neill

- men : children = 11 : 3
- women : children = 5 : 2

(a) Find the ratio men : women.
Give your answer in its simplest form.

$$\begin{array}{r} 22 \\ \times 6 \\ \hline 132 \end{array}$$

(b) There are 36 children in the village.
Find the total population of the village.

$$\begin{array}{r} 132 \\ 90 \\ + 36 \\ \hline 258 \end{array}$$

$$\begin{array}{l} \text{men} : \text{Women} : \text{children} \\ 11 : : : 3 \\ : 5 : : 2 \\ 22 : 15 : 6 \end{array}$$

$\left. \begin{array}{l} \text{3} \\ \text{2} \end{array} \right\} \times 3$
 $\left. \begin{array}{l} 22 \\ 15 \end{array} \right\} \times 2$

(a) $\frac{22}{\dots\dots\dots} : \frac{15}{\dots\dots\dots}$ [2]

M	W	C	
22	15	6	36 children = 6 parts
$\swarrow \times 6$	$\swarrow \times 6$	$\swarrow \times 6$	6 people = 1 part
132	90	36	

(b) $\frac{258}{\dots\dots\dots}$ [3]

Created by W Neill

- 12** Leo, Kush and Mai share some money in the ratio 3 : 5 : 8.
Kush receives £750 more than Leo.

Calculate the total amount of money that they shared.

£ [4]

- 12 Leo, Kush and Mai share some money in the ratio 3 : 5 : 8.
Kush receives £750 more than Leo.

Calculate the total amount of money that they shared.

$$L : K : M$$

$$3 : 5 : 8 \dots\dots 16 \text{ parts in total}$$

$$\begin{array}{l} \text{£}750 = 2 \text{ parts} \\ \text{£}375 = 1 \text{ part} \end{array} \quad \begin{array}{l} \text{£}375 = 1 \text{ part} \\ 16 \text{ parts} \end{array}$$

$$\text{£} \underline{\underline{6000}} \dots\dots [4]$$

Created by W Neill

- 18** Maria mixes white paint and red paint in the ratio 2 : 3.
She makes a total of 15 litres of paint.

How much more red paint does she need to add to the mixture so that the ratio of white paint to red paint becomes 1 : 5?

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

- 18 Maria mixes white paint and red paint in the ratio 2 : 3.
She makes a total of 15 litres of paint.

How much more red paint does she need to add to the mixture so that the ratio of white paint to red paint becomes 1 : 5?

$$\begin{array}{r}
 \text{W} \quad \text{R} \\
 15 \text{ Litres} = 2 : 3 \\
 \quad \quad \quad \swarrow \quad \searrow \\
 \quad \quad \quad 6\text{L} \quad \quad 9\text{L} \\
 15 \text{ Litres} = 5 \text{ parts} \\
 3 \text{ Litres} = 1 \text{ part}
 \end{array}$$

$$\begin{array}{r}
 \text{W} : \text{R} \\
 6\text{L} : 9\text{L} \\
 1 : 3 \\
 \times 6 \quad \quad \quad \times 6 \\
 6\text{L} : 30\text{L} \\
 30 - 9 = \\
 \quad \quad \quad 21
 \end{array}$$

..... litres [4]

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle.

[2]

(b) The hypotenuse of the triangle is 15 cm long.

Calculate the length of the shortest side in the triangle.

(b) cm [4]

19 The angles in a triangle are in the ratio 1 : 2 : 3.

(a) Show that the triangle is a right-angled triangle.

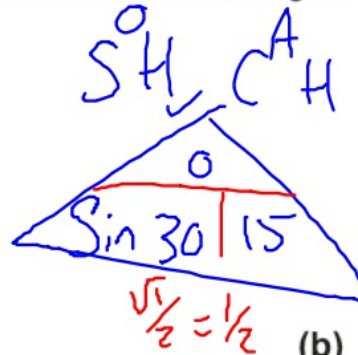
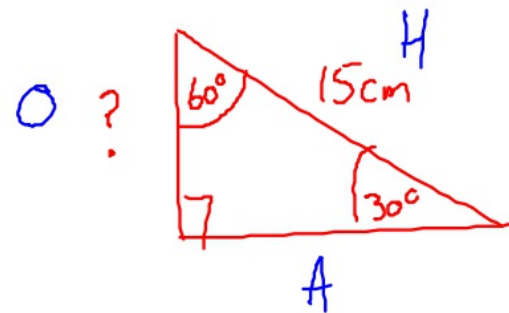
[2]

180°
 180° ... 1 : 2 : 3
 ÷ 6 ↘ 180° = 6 parts ↗ ÷ 6
 30° 1 part

15cm
 1 : 2 : 3
 ↙ | ↘
 30 60 90°
 Right angled as it has 90°

(b) The hypotenuse of the triangle is 15cm long.

Calculate the length of the shortest side in the triangle.



T°A

1/2 of 15
 1/2 x 15



= 7.5

(b) cm [4]

5 (a) Write 12:54 as a ratio in its simplest form.

R13

(a) : [2]

(b) The ratio 400g : 1 kg can be written in the form 1 : n .

R14 Find the value of n .

(b) $n =$ [2]

- (c) Amanda and Wim share some money in the ratio 2 : 5.
Wim receives £115.

R15a

Calculate how much money was shared.

(c) £ [3]

- 5 (a) Write 12:54 as a ratio in its simplest form.

R13

$$6 : 27$$

$$2 : 9 \quad \checkmark$$

— 1000g

(a) $2 : 9$ [2]

- (b) The ratio 400g : 1 kg can be written in the form 1 : n .

R14 Find the value of n .

$$400 : 1000 \quad \div 400 \rightarrow 1 : 2.5$$

(b) $n = 2.5$ [2]

- (c) Amanda and Wim share some money in the ratio 2:5.
Wim receives £115.

A W
7 intotal

R15a

Calculate how much money was shared.

$$\text{Wim} = 5 \text{ parts}$$

$$\begin{aligned} \div 5 \left(\begin{array}{l} 5 \text{ parts} = \pounds 115 \\ 1 \text{ part} = \pounds 23 \end{array} \right) \div 5 \\ 7 \text{ parts} = \end{aligned}$$

£161

(c) £ [3]

11 A recipe for flapjacks uses only oats, butter and syrup, in the ratio 3 : 2 : 1.

Created by W Neill

(a) Pirin makes 1.5kg of flapjacks.
He uses 600g of butter.

Has Pirin followed this recipe?
Show how you decide.

.....

.....

.....

.....

.....

.....

..... [4]

11 A recipe for flapjacks uses only oats, butter and syrup, in the ratio 3 : 2 : 1.

Created by W Neill

(a) Pirin makes 1.5kg of flapjacks.

He uses 600g of butter.

R15a

Has Pirin followed this recipe?

Show how you decide.

O B S

3 : 2 : 1 = 1.5kg

1500g = 6 part 750g : 500g : 250g = 1500g
250g = 1 part

NO, Recipe has not been followed as he should have used 600g and actually used 500g of butter.

[4]

- (b)** Bob and Chris share some money in the ratio 2 : 3.
Bob receives £8.

R15a

Work out how much Chris receives.

(b) £ [2]

(b) Bob and Chris share some money in the ratio 2 : 3.

R15a Bob receives £8.

Work out how much Chris receives.

$$\begin{aligned} & \times £4 \\ & = £12 \end{aligned}$$

$$\begin{aligned} £8 &= 2 \text{ parts} \\ £4 &= 1 \text{ part} \end{aligned}$$

(b) £ 12 [2]

9 Liu wants to decorate some cakes with shapes.

R15a She has 140 shapes.

Each shape is a star or a heart.

The ratio of the number of stars : number of hearts is 4 : 3.

She wants to put 5 stars and 4 hearts on each cake.

How many cakes can Liu decorate?

Show full working to support your answer.

..... [5]

9 Liu wants to decorate some cakes with shapes.

R15a She has 140 shapes.

Each shape is a star or a heart.

The ratio of the number of stars : number of hearts is 4 : 3.

She wants to put 5 stars and 4 hearts on each cake.

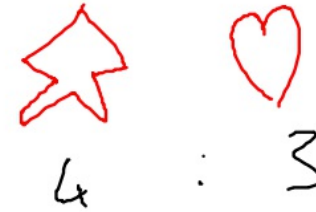
How many cakes can Liu decorate?

Show full working to support your answer.

$$80 \text{ stars} \div 5 = 16 \text{ cakes}$$

$$60 \text{ hearts} \div 4 = 15 \text{ cakes}$$

The most she can make is 15 cakes



$$140 \text{ shapes} = 7 \text{ parts}$$

$$20 \text{ shapes} = 1 \text{ part}$$

$$\begin{aligned} \text{Stars} \dots 4 \times 20 &= 80 \text{ stars} \\ \text{Hearts} \dots 3 \times 20 &= 60 \text{ hearts} \end{aligned}$$

15 ✓

[5]

11 Some biscuits contain only three ingredients: flour, butter and sugar.

R15a

- The ratio of flour to butter is 5 : 4.

R15b

- The ratio of butter to sugar is 2 : 1.
- The total weight of the flour, butter and sugar is 770g.

Work out the weight of each of the ingredients.

Flour g

Butter g

Sugar g [4]

11 Some biscuits contain only three ingredients: flour, butter and sugar.

R15a

- The ratio of flour to butter is 5 : 4.

R15b

- The ratio of butter to sugar is 2 : 1.
- The total weight of the flour, butter and sugar is 770g.

Work out the weight of each of the ingredients.

$$\begin{array}{r}
 F : B : S \\
 5 : 4 : 1 \\
 \hline
 5 : 4 : 2
 \end{array}
 \quad \begin{array}{l}
 \text{↙} \\
 \text{↘} \\
 \times 2
 \end{array}$$

$$11 \overline{) 770}$$

$$770g = 11 \text{ parts}$$

$$70g = 1 \text{ part} \quad \leftarrow \div 11$$

$$70 \times 5 = 350$$

$$\begin{array}{r}
 F : B : S \\
 5 : 4 : 2 \\
 350g \quad 280g \quad 140g
 \end{array}$$

Flour 350 g

Butter 280 g

Sugar 140 g [4] ✓

(b) Jay, Sheila and Harry share £7200 in the ratio 1 : 2 : 5.

How much does Harry receive?

(b) £ **[2]**

J S H

(b) Jay, Sheila and Harry share £7200 in the ratio 1 : 2 : 5. 8 parts

How much does Harry receive?

$$\begin{aligned} & \text{£}7200 = 8 \text{ parts} \\ \times 5 \quad \left(\begin{aligned} & \text{£}900 = 1 \text{ part} \\ & \text{£}4500 = 5 \text{ parts} \end{aligned} \right. \end{aligned}$$

(b) £ 4500 [2]

22 In a village the ratio of males to females is 2 : 1.

R13 40% of the people in the village are right-handed males.
25% of the people in the village are right-handed females.

Show that the proportion of females who are right-handed is greater than the proportion of males who are right-handed. **[6]**

22 In a village the ratio of males to females is 2:1. $\div 3$

3000

→ saying 3000

R13 40% of the people in the village are right-handed males.
25% of the people in the village are right-handed females.

Show that the proportion of females who are right-handed is greater than the proportion of males who are right-handed. [6]

$$\begin{array}{c} 3000 \\ \text{M} \\ 2 : 1 \\ \text{F} \\ 2000 : 1000 \end{array}$$

$$40\% \text{ of } 3000 = 1200$$

$$25\% \text{ of } 3000 = 750$$

Right Female

$$\frac{750}{1000} = \frac{75}{100}$$

Right Male

$$\frac{1200}{2000} = \frac{60}{100}$$

$$\frac{75}{100} > \frac{60}{100} \checkmark$$

- 6 In a box of mixed nuts, the total number of almonds, cashews and peanuts is 1025.
The ratio of almonds to cashews is 1 : 3.
The ratio of cashews to peanuts is 5 : 7.

Calculate the number of cashews in the box.

R15a

R15b

..... [4]

- 6 In a box of mixed nuts, the total number of almonds, cashews and peanuts is 1025.
The ratio of almonds to cashews is 1 : 3.
The ratio of cashews to peanuts is 5 : 7.

Calculate the number of cashews in the box.

R15a
R15b

$$\begin{array}{l} A : C : P \\ 1 : 3 \\ \quad 5 : 7 \\ \hline 5 : 15 : 21 \end{array}$$

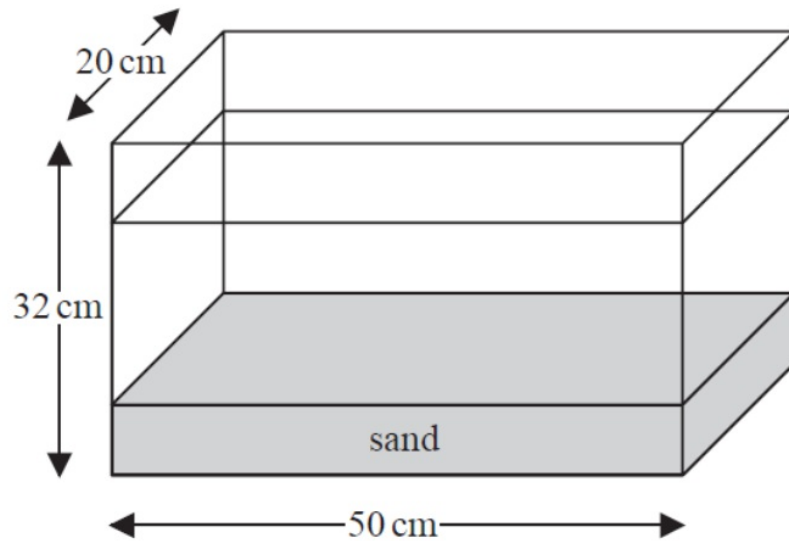
(Handwritten notes: A red arrow labeled 'x5' points from the '5' in the bottom row to the '1' in the middle row. A red arrow labeled 'x3' points from the '3' in the middle row to the '15' in the bottom row. The '15' in the bottom row is circled in red.)

$$\begin{array}{l} 1025 = 41 \text{ parts} \\ 25 = 1 \text{ part} \\ 375 = 15 \text{ parts} \end{array}$$

(Handwritten notes: A red arrow labeled 'x15' points from the '15' in the bottom row to the '25' in the middle row. A red arrow labeled 'x15' points from the '15' in the bottom row to the '375' in the bottom row.)

375 ✓

21 The diagram shows a fish tank in the shape of a cuboid.



The dimensions of the tank are 50 cm by 32 cm by 20 cm.

The tank is $\frac{3}{4}$ full of water and sand.

The ratio of the volume of water to the volume of sand is 5 : 1

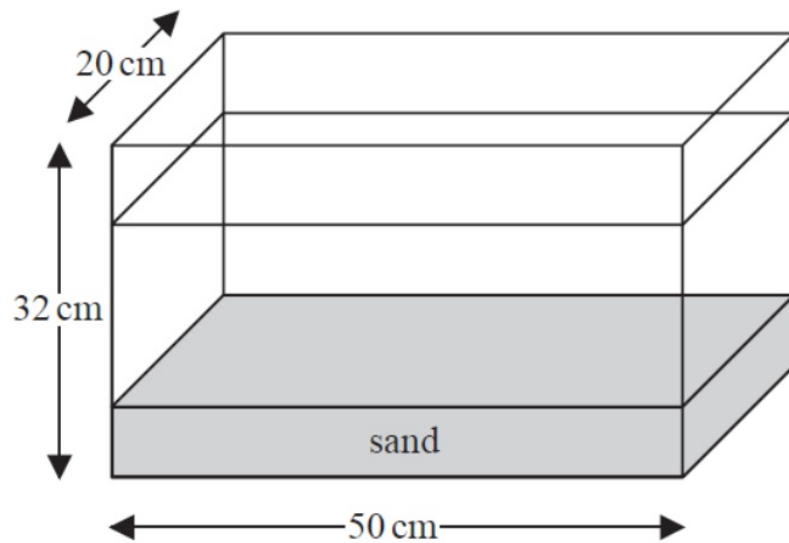
Work out the number of litres of water in the tank.

You must show all your working.

.....litres

(Total for Question 21 is 5 marks)

21 The diagram shows a fish tank in the shape of a cuboid.



Volume of cuboid

$$50 \times 20 \times 32 = 1000 \times 32 \\ = 32000 \text{ cm}^3$$

$$\frac{3}{4} \text{ of } 32000 \text{ cm}^3 = 24000 \text{ cm}^3 \\ \therefore 4 \times 3$$

Water : Sand
5 : 1

$$24000 \div 6 \\ = 4000 \times 5 \dots 20000 \text{ cm}^3 \quad \rightarrow \text{Water} \\ 4000 \times 1 = 4000 \text{ cm}^3$$

The dimensions of the tank are 50 cm by 32 cm by 20 cm.

The tank is $\frac{3}{4}$ full of water and sand.

The ratio of the volume of water to the volume of sand is 5 : 1

Work out the number of litres of water in the tank.

You must show all your working.

$$1000 \text{ cm}^3 = 1 \text{ Litre} \quad 20,000 \text{ cm}^3 =$$

20 litres

(Total for Question 21 is 5 marks)

Edexcel

16 In a tin of baked beans,

weight of beans : weight of tomatoes : weight of other ingredients = 3 : 2 : 1

There are 150 g of tomatoes in the tin.

Work out the weight of the beans.

.....g

(Total for Question 16 is 2 marks)

16 In a tin of baked beans,

weight of beans : weight of tomatoes : weight of other ingredients = 3 : 2 : 1

There are 150 g of tomatoes in the tin.

Work out the weight of the beans.

$$\begin{array}{l} B : T : O \\ 3 : 2 : 1 \\ 225 : 150g : 75g \end{array}$$



225

(Total for Question 16 is 2 marks)

16 Only blue vans and white vans are made in a factory.

The ratio of the number of blue vans to the number of white vans is 4 : 3

(a) Write down the fraction of vans that are blue.

.....
(1)

For blue vans,

the number of small vans : the number of large vans = 3 : 5

(b) Work out the fraction of the number of vans made in the factory that are blue and large.

(3)

(Total for Question 16 is 4 marks)

6 Only blue vans and white vans are made in a factory.

The ratio of the number of blue vans to the number of white vans is 4 : 3

(a) Write down the fraction of vans that are blue.

$$\begin{array}{l} B : W \\ 4 : 3 \end{array}$$

$$\frac{4}{7}$$

(1)

For blue vans,

the number of small vans : the number of large vans = 3 : 5

(b) Work out the fraction of the number of vans made in the factory that are blue and large.

$$\begin{array}{l} \text{Blue} \\ S : L \\ 3 : 5 \\ \frac{5}{8} \end{array}$$

$$\begin{array}{l} \frac{5}{8} \text{ of blue} \\ \frac{5}{8} \text{ of } \frac{4}{7} \\ \times \end{array}$$

$$= \frac{20}{56} \checkmark$$

(3)

(Total for Question 6 is 4 marks)

19 Divide 7560 in the ratio 4 : 5

R15a

..... ,

(Total for Question 19 is 2 marks)

19 Divide 7560 in the ratio 4:5

R15a

$$\begin{array}{r}
 \div 9 \left\{ \begin{array}{l} 7560 = 9 \text{ parts} \\ 840 = 1 \text{ part} \end{array} \right. \div 9
 \end{array}$$

$$\begin{array}{r}
 4 : 5 \\
 \leftarrow \times 840 \qquad \rightarrow \times 840 \\
 \hline
 3360 \quad , \quad 4200
 \end{array}$$

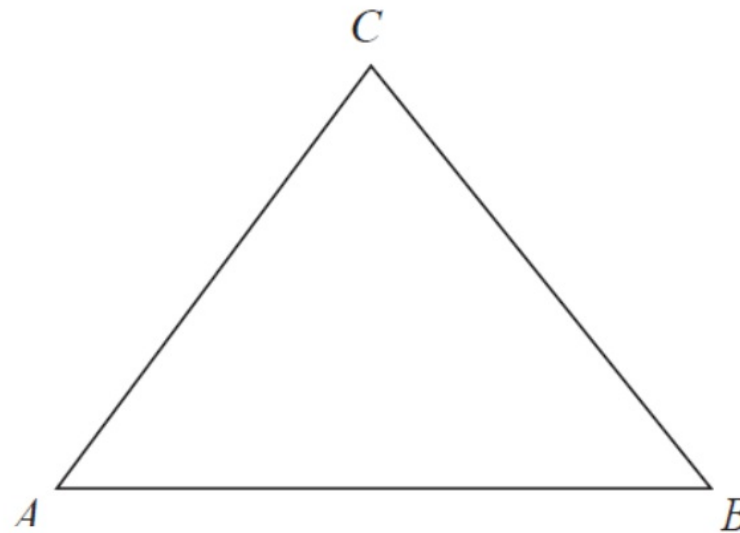
(Total for Question : is 2 marks)

26 The diagram shows triangle ABC .

R15a

G18

G44



The perimeter of the triangle is 64 cm.

$$AB : BC : CA = 6 : 5 : 5$$

Work out the area of the triangle.

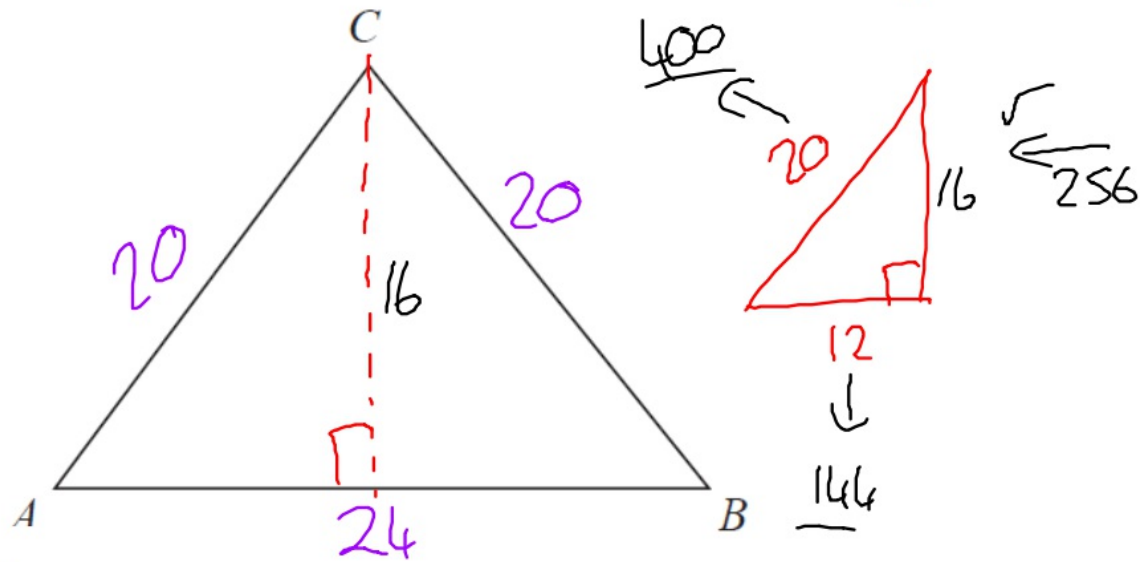
.....cm²

(Total for Question 26 is 5 marks)

26 The diagram shows triangle ABC .

R15a
G18
G44

$$\text{Area} = \frac{B \times H}{2}$$



The perimeter of the triangle is 64 cm.

$$AB : BC : CA = 6 : 5 : 5 \quad 16 \text{ parts}$$

Work out the area of the triangle.

$$6 \text{ cm} = 16 \text{ part}$$

$$4 \text{ cm} = 1 \text{ part}$$

$$6 : 5 : 5$$

Handwritten arrows point from the ratios to the side lengths: $6 \rightarrow 24$, $5 \rightarrow 20$, $5 \rightarrow 20$.

$$\frac{B \times H}{2} = \frac{24 \times 16}{2}$$

$$192 \text{ cm}^2$$

(Total for Question . . . is 5 marks)

18 On Saturday, some adults and some children were in a theatre.
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$ of the children had seats in the Stalls.

117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?
You must show how you get your answer.

18 On Saturday, some adults and some children were in a theatre.
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$\frac{3}{4}$ of the children had seats in the Stalls.

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You must show how you get your answer.

Children
 $\frac{3}{4}$ Stalls
 $\frac{1}{4}$ Circle (117)

$\left. \begin{array}{l} \frac{1}{4} = 117 \\ \frac{3}{4} = 351 \end{array} \right\} \times 3$
Children = 468 ✓

468 = 2 part
234 = 1 part
1170 = 5 parts

Adults : Children
5 : 2
1170 : 468 ✓
Total = 1638 people

1638 people in theatre.

$\frac{1638}{2600} = 0.63$
63% full

Yes, more than 60% of seats were full.

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

How much money does Kelan get?

£.....

(Total for Question 18 is 2 marks)

H R K

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

How much money does Kelan get?

$$\begin{array}{l} \div 10 \left\{ \begin{array}{l} £450 = 10 \text{ parts} \\ £45 = 1 \text{ part} \end{array} \right. \div 10 \end{array}$$

$$45 \times 3$$

$$\begin{array}{r} 45 \\ \times 3 \\ \hline 135 \end{array}$$

£ 135

(Total for Question 18 is 2 marks)

15 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.

	2 m	6 m	8 m	9 m
cotton fabric	£6			
silk fabric				

(Total for Question 15 is 3 marks)

15 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.

$$2 \text{ parts} = \pounds 6$$

$$1 \text{ part} = \pounds 3$$

$$5 \text{ parts} = \pounds 15$$

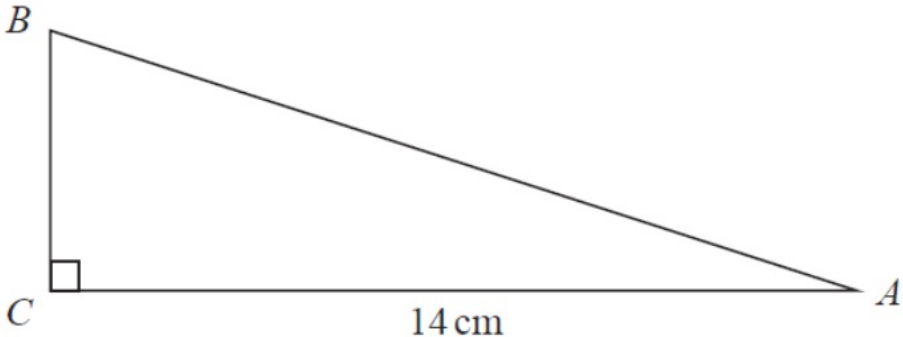
$$\text{Cotton : Silk} \\ 2 : 5 = 7 \text{ parts}$$

	2 m	6 m	8 m	9 m	1 m
cotton fabric	£6	£18	£24	£27	£3
silk fabric	£15	£45	£60	£67.50	£7.50

(Total for Question 15 is 3 marks)

25 ABC is a right-angled triangle.

R15a
G46



$AC = 14\text{ cm}$.

Angle $C = 90^\circ$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB .

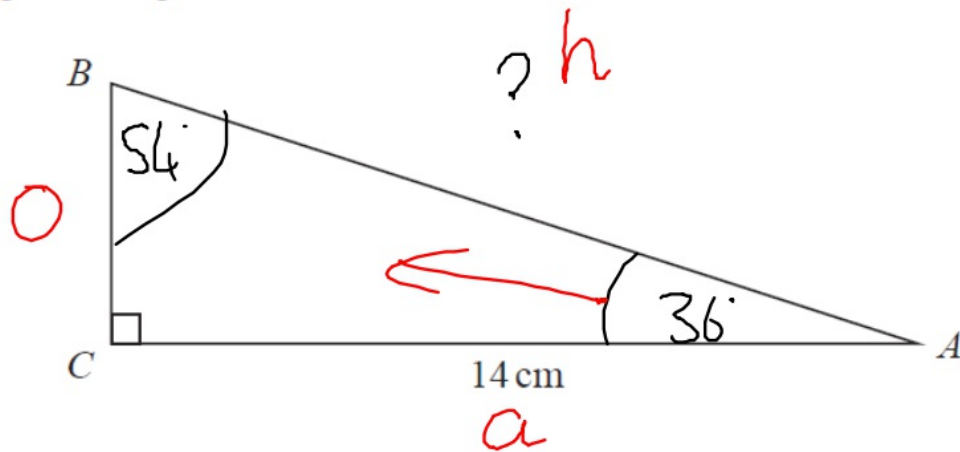
Give your answer correct to 3 significant figures.

.....cm

(Total for Question 25 is 4 marks)

25 *ABC* is a right-angled triangle.

R15a
G46



90° .. $\begin{matrix} B & A \\ 3 & 2 \end{matrix}$

$90^\circ = 5 \text{ parts}$
 $18 = 1 \text{ part}$

$3 : 2$

$54 : 36$

$AC = 14 \text{ cm.}$

Angle $C = 90^\circ$

size of angle B : size of angle $A = 3 : 2$

Work out the length of AB .

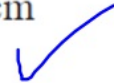
Give your answer correct to 3 significant figures.



$H =$

17.3 cm

(Total for Question is 4 marks)



13 Ben fills a glass with orange juice and lemonade in the ratio 1 : 4 by volume.
He mixes the liquid that is in the glass.

Ben drinks $\frac{1}{4}$ of this liquid.

He then fills the glass using orange juice.

Work out the ratio of orange juice to lemonade, by volume, that is now in the glass.
Give your ratio in its simplest form.

R15a

.....
(Total for Question 13 is 3 marks)

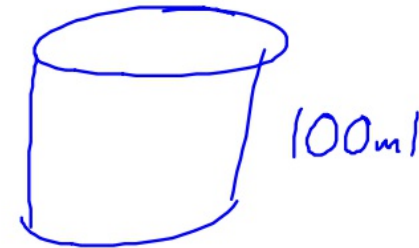
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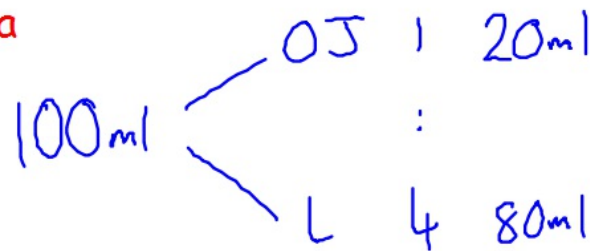
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Give your ratio in its simplest form.

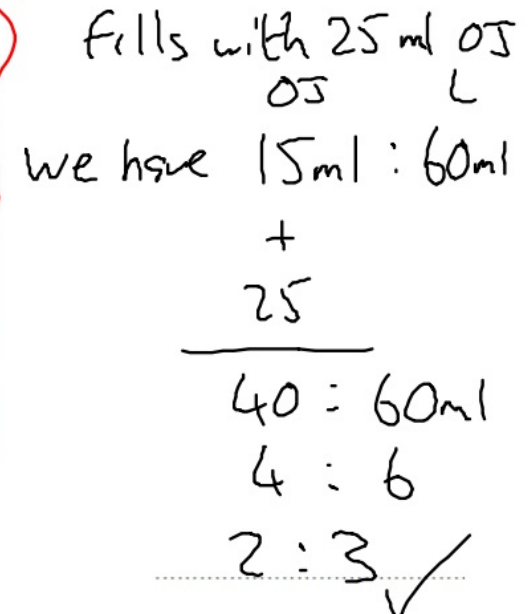
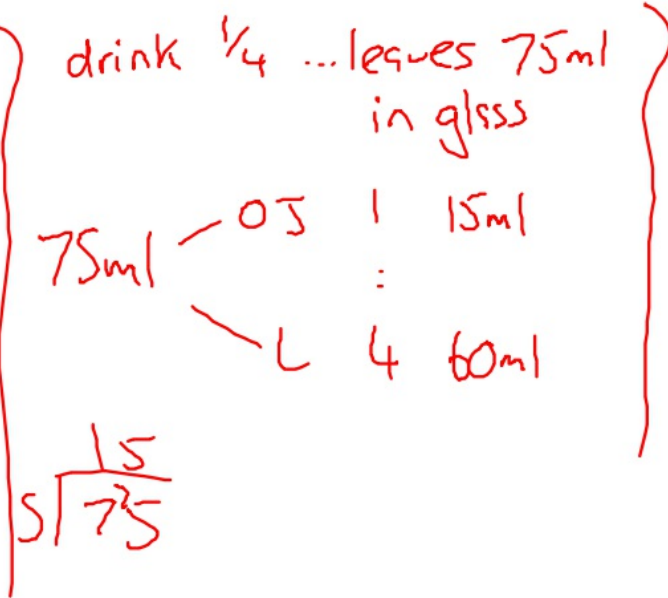
Assign an amount



R15a



$$\frac{100}{5} = 20$$



(Total for Question 13 is 3 marks)

15 Three solid shapes **A**, **B** and **C** are similar.

Video Created by W Neill

R15a The surface area of shape **A** is 4 cm^2

G56 The surface area of shape **B** is 25 cm^2

The ratio of the volume of shape **B** to the volume of shape **C** is $27:64$

Work out the ratio of the height of shape **A** to the height of shape **C**.

Give your answer in its simplest form.

(Total for Question 15 is 4 marks)

15 Three solid shapes A, B and C are similar.

Video Created by W Neill

R15a The surface area of shape A is 4 cm^2

G56 The surface area of shape B is 25 cm^2

The ratio of the volume of shape B to the volume of shape C is $27:64$

Work out the ratio of the height of shape A to the height of shape C.
Give your answer in its simplest form.

	A	:	B	:	C
	2	:	5	:	4
			3	:	
L					
A	4	:	25		
V			27	:	64

Handwritten notes: A red arrow labeled 'L' points from the top row to the middle row. A red arrow labeled 'V' points from the bottom row to the middle row. A red arrow labeled '3√' points from the '4' in the middle row to the '64' in the bottom row.

	A	:	B	:	C	
	2	:	5	:		
			3	:	4	
x3	-----					x5
	6	:	15	:	20	
			A:C			
			6:20			
			3:10			

Handwritten notes: A red arrow labeled 'x3' points from the '2' in the second row to the '6' in the fourth row. A red arrow labeled 'x5' points from the '4' in the third row to the '20' in the fourth row.

(Total for Question 15 is 4 marks)

AQA

17 CD and PQ are lines of length 12 cm

17 (a) $CE : CD = 1 : 2$

Mark point E on the line with a cross.

[1 mark]



17 (b) $PR : RQ = 1 : 3$

Mark point R on the line with a cross.

[1 mark]



17 CD and PQ are lines of length 12 cm

17 (a) $CE : CD = 1 : 2$ $CE \frac{1}{2}$ the size

R15a

Mark point E on the line with a cross.

[1 mark]



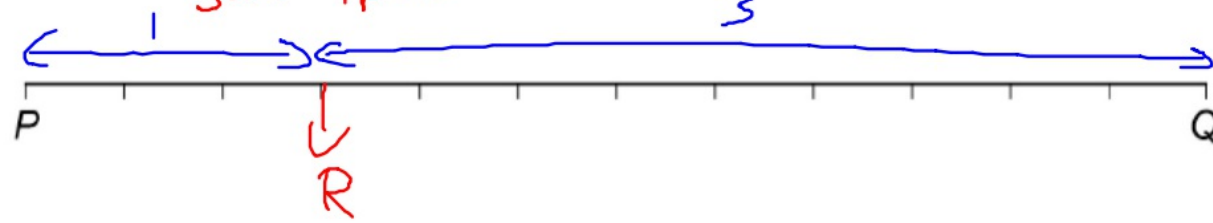
17 (b) $PR : RQ = 1 : 3$ 4 parts

R15a

Mark point R on the line with a cross.

12cm $\frac{3}{1} + \frac{9}{3}$
 $\div 4 \rightarrow 12\text{cm} = 4 \text{ parts} \rightarrow 3\text{cm} \text{ 1 part} \rightarrow 9$
 3

[1 mark]



- 21 Purple paint is made by mixing red paint and blue paint in the ratio 5 : 2
Yan has 30 litres of red paint and 9 litres of blue paint.

What is the **maximum** amount of purple paint he can make?

[3 marks]

Answer _____ litres

21 Purple paint is made by mixing red paint and blue paint in the ratio 5 : 2

Yan has 30 litres of red paint and 9 litres of blue paint.

R15a

What is the maximum amount of purple paint he can make?

[3 marks]

Red : Blue

Purple = 5 : 2

has = 30 : 9

(Handwritten arrows show 5 multiplied by 6 to get 30, and 2 multiplied by 4.5 to get 9)

X R : B

5 : 2

x6 () x6

30 : 12

Red Blue

5 : 2

x4.5 () x4.5

22.5L + 9

Answer 31.5 litres ✓

or 31 Litres ✓

22 $x : y = 7 : 4$

R15a $x + y = 88$

Work out the value of $x - y$

[3 marks]

Answer _____

22 $x : y = \underline{7 : 4}$

R15a $x + y = 88$

Work out the value of $x - y$

[3 marks]

$$88 = 11 \text{ parts}$$

$$8 = 1 \text{ part}$$

$$\begin{array}{r} \text{x8} \swarrow \\ 7 : 4 \\ \swarrow \quad \searrow \\ 56 \quad 32 \\ \text{x} \quad \quad \text{y} \end{array}$$

$$\begin{array}{r} \text{x} - \text{y} \\ 56 - 32 \\ = \end{array}$$

Answer _____

24 ✓

19 (a) Divide 120 in the ratio 1 : 4

[2 marks]

R15a

Answer _____ : _____

24 Divide 405 in the ratio 4 : 11

[3 marks]

R15a

Answer _____ and _____

24 Divide 405 in the ratio 4 : 11

[3 marks]

R15a

$$\begin{array}{l} \div 15 \hookrightarrow 405 = 15 \text{ parts} \\ \div 15 \hookrightarrow 27 = 1 \text{ part} \end{array}$$

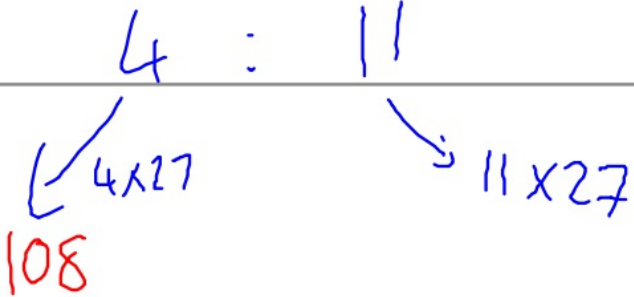
- 15
- 30
- 45
- 60
- 75
- 90
- 105

$$15 \overline{) 405}$$

check

$$\begin{array}{r} 297 \\ 108 \\ \hline 405 \end{array} \checkmark$$

$$\begin{array}{r} 27 \\ \times 4 \\ \hline 108 \end{array}$$



$$\begin{array}{r} 27 \\ \times 11 \\ \hline 27 \\ 270 \\ \hline 297 \end{array}$$

Answer 108 and 297

18 There are 240 cows on a farm.

18 (a) On the farm,

R13

number of bulls : number of cows = 1 : 30

How many bulls are there?

[1 mark]

Answer

18 There are 240 cows on a farm.

18 (a) On the farm,

R13

number of bulls : number of cows = 1 : 30

How many bulls are there?

B : C

[1 mark]

$$\begin{array}{ccc} \times 8 & \left(\begin{array}{c} 1 : 30 \\ 8 : 240 \end{array} \right) & \times 8 \end{array}$$

Answer 8 Bulls

18 (b)

Assume

N28

the 240 cows produce milk for 10 months each year
each cow produces an average of 25 litres of milk per **day**.

Estimate the total milk production, in litres, of the 240 cows in one year.

You **must** show your working.

[4 marks]

Answer _____ litres

18 (b) Assume

the 240 cows produce milk for 10 months each year
each cow produces an average of 25 litres of milk per **day**.

N28

Estimate the total milk production, in litres, of the 240 cows in one year.

You **must** show your working.

Per day

$$240 \times 25 \text{ litres}$$

6000 litres
per day

Per month (30 days)

$$\underline{6000} \times \underline{30}$$

180000 litres

10 months

$$\times 10$$

[4 marks]

Answer 1800000 litres

- 19 Rana sells 192 cakes in the ratio small : medium : large = 7 : 6 : 11
The profit for one medium cake is twice the profit for one small cake.
The profit for one large cake is three times the profit for one small cake.
Her total profit is £532.48

Work out the profit for one small cake.

[5 marks]

Answer £ _____

19 Rana sells 192 cakes in the ratio small : medium : large = 7 : 6 : 11

The profit for one medium cake is twice the profit for one small cake.

The profit for one large cake is three times the profit for one small cake.

Her total profit is £532.48

Work out the profit for one small cake.

192 cakes = 24 parts
8 cake = 1 part

S M L
7 : 6 : 11

= Cakes 56 : 48 : 88

S M L
Cakes 56 : 48 : 88
x \downarrow \circledast : 2x : 3x
56x 96x 264x

Total profit = 416x = £532.48
 $\div 416$
x = £1.28

Answer £ 1.28 ✓

- 14 (b)** A different pattern is made using 20 straight lines and 16 arcs.
The straight lines and arcs are made from metal.

R15a

20 straight lines cost £12

cost of one straight line : cost of one arc = 2 : 3

Work out the **total** cost of the metal in the pattern.

[3 marks]

Answer £ _____

14 (b) A different pattern is made using 20 straight lines and 16 arcs.

The straight lines and arcs are made from metal.

R15a

20 straight lines cost £12

cost of one straight line : cost of one arc = 2 : 3

Work out the **total** cost of the metal in the pattern.

$$1 \text{ SL} = 60\text{p}$$

$$1 \text{ ARC} = 90\text{p}$$

$$20 \text{ SL} = \text{£}12$$

$$1 \text{ SL} = \frac{\text{£}12}{20} = \frac{1200\text{p}}{20}$$

$$= 60\text{p}$$

1 straight line = 60p

2 parts
= 60p

1 part
= 30p

SL : ARC

2 : 3

↙
60p

↘
90p

$$\text{SL} \dots 20 \times 60\text{p} = \text{£}12$$

$$1 \text{ Arc} \dots 16 \times 90\text{p} = 1440\text{p}$$

$$= \text{£}14.40$$

$$\begin{array}{r} 16 \\ \times 9 \\ \hline 144 \end{array}$$

Total cost

14.40

+ 12

26.40 ✓

Answer £

26.40 ✓