

1

Mari is the presenter of a weekly radio show.

[2004]



She always plays **five** new songs for every **two** old songs.

Last week she played 15 **new** songs.

How many songs did she play **altogether**?

Show your method	NEW ; OLD	TOTAL	
	5 ; 2	5	
	$\downarrow \times 3$	$\downarrow \times 3$	
	15	6 \rightarrow 21	21

[2 marks]

2

Amina planted some seeds.

[2017]

For every 3 seeds Amina planted, only 2 seeds grew.

Altogether, 12 seeds grew.

How many seeds did Amina **plant**?

PLANTED :	GREW	
3 :	2	
$\downarrow \times 6$	$\downarrow \times 6$	
<u>18</u>	12	18

[1 mark]

3

David and his friends prepare a picnic.

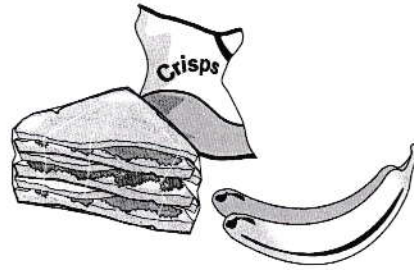
[2006]

Each person at the picnic will get:

3 sandwiches

2 bananas

1 packet of crisps

The children pack **45** sandwiches.How many **bananas** do they pack?

Show your method

S	:	B	:	C
3	:	2	:	1
$\downarrow \times 15$		$\downarrow \times 15$		
45		<u>30</u>		

30

[2 marks]

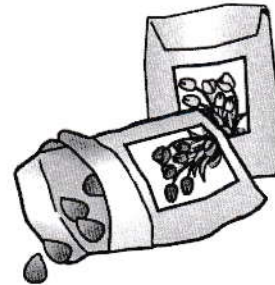
4

A gardener plants tulip bulbs in a flower bed.

[2012]

She plants 3 red bulbs for every 4 white bulbs.

She plants 60 red bulbs.

How many **white** bulbs does she plant?

Show your method

RED	:	WHITE
3	:	4
$\downarrow \times 20$		$\downarrow \times 20$
60		<u>80</u>

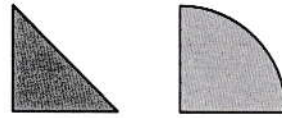
80

[2 marks]

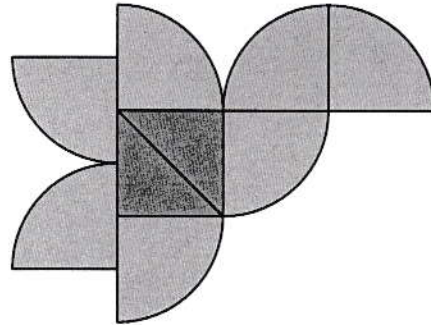
5

[2011]

Joe has some triangular tiles and some quarter-circle tiles.



He uses 2 triangles and 7 quarter-circles to make this 'flying bird' design.



Joe makes some more of these 'flying bird' designs.

He uses 56 quarter-circles.

How many **triangles** does he use?

Show your method

TRI	:	QUART-CIR.	
2	:	7	
$\times 8$		$\times 8$	
\downarrow		\downarrow	
<u>16</u>		56	16

[2 marks]

6

[Extra]

Two numbers are in the ratio 4 : 5

One of the numbers is 60

There are two possible values for the other number.

What are the two possible values?

4 : 5	OR	4 : 5	
$\times 15$		$\times 12$	
\downarrow		\downarrow	
60		<u>48</u>	75
<u>75</u>		60	48

[2 marks]

7

A dessert has both fruit and yoghurt inside.

[Extra]



Altogether, the mass of the fruit and yoghurt is **175g**.

The **ratio** of the mass of **fruit** to the mass of **yoghurt** is **2 : 5**

What is the mass of the yoghurt?

FRUIT : YOGHURT

2 : 5

↓ x25
125

TOTAL

7

↓ (x25)
175

125 g

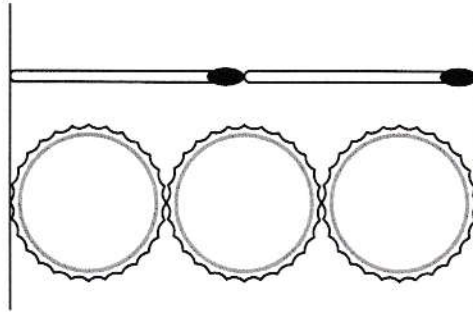
$$\left[\begin{array}{r} 25 \\ 7 \overline{) 175} \end{array} \right]$$

[1 mark]

8

Two matchsticks have the same length as three bottle tops.

[2007]



How many bottle tops will have the same length as 50 matchsticks?

Show your method

MATCHES : BOTTLE TOPS

2 : 3

(x25) ↓

50

↓ x25

75

75

[2 marks]

9

Rita buys a box of chocolates.

[Extra]

For every 2 plain chocolates there are 3 milk chocolates.

There are 30 chocolates in the box.

→ TOTAL = 30!

How many milk chocolates are there?

Show your method

PLAIN : MILK TOTAL

2 : 3

5

↓ ×6

↓ ×6

18

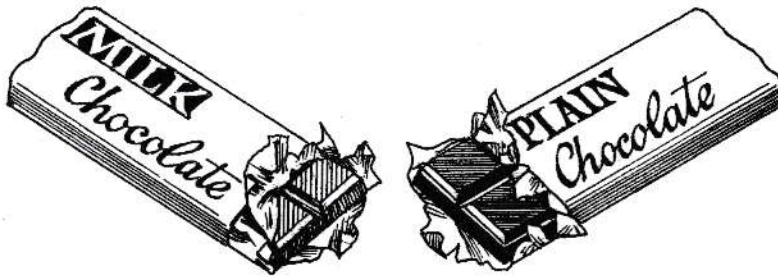
30

18

[2 marks]

10

[2001]



In a survey, the **ratio** of the number of people who preferred **milk chocolate** to those who preferred **plain chocolate** was **5 : 3**

46 more people preferred milk chocolate, to plain chocolate.

How many people were in the survey?

Show your method

MILK : PLAIN

TOTAL

5 : 3

8

2 [DIFFERENCE] ↓ ×23

↓ ×23
46

184

184

[2 marks]

11

There are 90 children in Year 6 at Woodland Junior School.

[Extra]

They are split into three classes.

Class	Number in class
6M	27
6P	33
6T	30

Each child chose football **or** netball **or** hockey.

In **6M**, 13 children chose hockey. $27 - 13 = 14$, $\frac{14}{2} = 7$

The rest of the class were split equally between football and netball.

In **6P**, 9 children chose netball. $33 - 9 = 24$

Twice as many children chose football as chose hockey. $2:1 \rightarrow 16:8$

In **6T**, the ratio of children who chose football to netball to hockey was 1:2:3

$$\begin{array}{r}
 F:N:H \quad \text{TOTAL} \\
 1:2:3 \quad 6 \\
 \times 5 \downarrow \downarrow \downarrow \quad \downarrow \textcircled{\times 5} \\
 5 \quad 10 \quad 15 \quad 30
 \end{array}$$

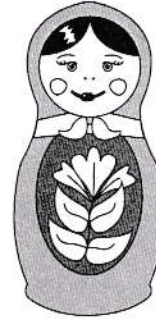
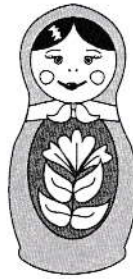
Complete this table.

Class	Number in class	Football	Netball	Hockey
6M	27	7	7	13
6P	33	16	9	8
6T	30	5	10	15

[3 marks]

The heights of Russian dolls are in the ratio 4 : 6 : 7

[Extra]



$$4 : 6 : 7$$

\downarrow \downarrow \downarrow
 6 9 10.5

$\times 1.5$
 \downarrow
 10.5

In a set of dolls, the height of the **middle** doll is **9cm**.

What are the heights of the other dolls?

..... 6 cm
smallest

..... 9 cm
middle

..... 10.5 cm
tallest

In another set of dolls, the height of the **tallest** doll is **9cm**.

What are the heights of the other dolls?

Show your working, and give your answers to **1 decimal place**.

$$4 : 6 : 7$$

\downarrow \downarrow \downarrow
 9

$\times 1.28$

1.28
 $\times 4$
 \hline
 5.12
 \hline
 1.3

1.28
 $\times 6$
 \hline
 7.68
 \hline
 1.4

1.28
 $7 \overline{) 9.00}$
 $\underline{7.68}$
 1.32

..... 5.1 cm
smallest

..... 7.7 cm
middle

..... 9 cm
tallest

[3 marks]

13

Work out the number of boys and girls in each class below.

[Extra]

In class 8M, there are **27 pupils**.There are **twice as many boys** as girls.

$$\begin{array}{l}
 B : G \\
 2 : 1 \\
 \times 9 \downarrow \quad \downarrow \times 9
 \end{array}$$

$$\begin{array}{l}
 \text{TOTAL} \\
 3 \\
 \downarrow \textcircled{\times 9} \\
 27
 \end{array}$$



Number of boys	Number of girls
18	9

In class 8K, there are **28 pupils**.There are **two more boys** than girls.

$$\begin{array}{l}
 B : G \\
 14 : 14 \\
 15 : 13 \quad \checkmark
 \end{array}$$



Number of boys	Number of girls
15	13

In class 8T, there are **9 boys**.The ratio of boys to girls is **1 : 2**

$$\begin{array}{l}
 B : G \\
 1 : 2 \\
 \textcircled{\times 9} \downarrow \quad \downarrow \times 9 \\
 9 \quad 18
 \end{array}$$



Number of boys	Number of girls
9	18

[3 marks]

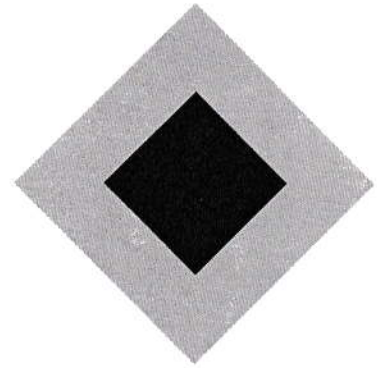
14

In this design, the ratio of grey to black is 3 : 1

[Extra]

What percentage of the design is black?

GREY :	BLACK	TOTAL
3 :	1	4
\downarrow	\downarrow	
$\frac{3}{4}$	$\frac{1}{4}$	
[75%]	[25%]	<u>25</u> %

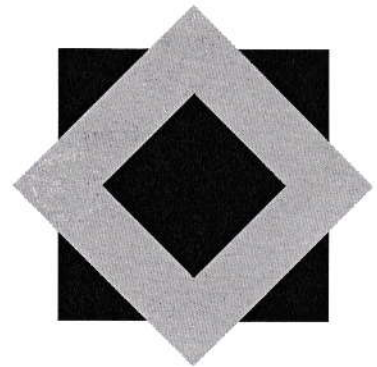


In this design, 60% is grey and the rest is black.

What is the ratio of grey to black?

Write your ratio in its simplest form.

GREY :	BLACK	[TOTAL IS
60% :	40%	100%!]
\downarrow	\downarrow	
60 :	40	
6 :	4	
3 : 2		
<u>3</u> :	<u>2</u>	



[2 marks]

15

Paul is 14 years old.

[Extra]

His sister is exactly **6 years younger**, so this year she is 8 years old.

This year, the ratio of Paul's age to his sister's age is 14 : 8


14 : 8 written as simply as possible is **7 : 4**

When Paul is **21**, what will be the ratio of Paul's age to his sister's age?

Write the ratio as simply as possible.

+7 YEARS

$$14 : 8 \rightarrow \begin{array}{l} 21 : 15 \\ \hline 7 : 5 \end{array}$$


 7 : 5

When his sister is **36**, what will be the ratio of Paul's age to his sister's age?

Write the ratio as simply as possible.

+28 YEARS

$$14 : 8 \rightarrow \begin{array}{l} 42 : 36 \\ \hline 7 : 6 \end{array}$$

 7 : 6

Could the ratio of their ages ever be 7 : 7?

Tick (✓) Yes or No.

Yes

No

Explain how you know.

TO GET TO 7:7 THEY WOULD
HAVE TO BE THE SAME AGE, BUT
PAUL WILL ALWAYS BE 6 YEARS OLDER!

[3 marks]

16

Teresa buys **two** packets of sweets.

[Extra]

In the **first packet** there are **three** strawberry sweets for every **five** lemon sweets.

In the **second packet** there are **three** strawberry sweets for every **two** lemon sweets.

Each packet contains the same number of sweets.

The first packet contains **15** strawberry sweets.

How many strawberry sweets are there in the second packet?

Show your method

1ST	TOTAL	2ND	TOTAL
S : L		S : L	
3 : 5	8	3 : 2	5
↓ (x5)	↓ x5	↓ x8	↓ (x8)
15	40	24	40
[SWEETS IN EACH PACKET]			
			24

[2 marks]

17

Two numbers are in the **ratio 3 : 2**

[2002]

One of the numbers is **0.6**

There are two possible answers for the other number.

What are the two possible answers?

3 : 2 OR 3 : 2

$\downarrow \div 5$ $\downarrow \div 5$ $\downarrow \div 10 \times 3$

0.6 0.4 0.9 0.6

0.4
0.9

[2 marks]

18

Susan mixes red and blue paint to make purple paint.

[Extra]

2 parts of red paint with 3 parts of blue paint make purple paint.

Susan has 50 ml of red and 100 ml of blue.



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

USING ALL THE RED PAINT

RED	BLUE	TOTAL
2	3	5
$\downarrow \times 25$	$\downarrow \times 25$	
50	75	125

125 ml

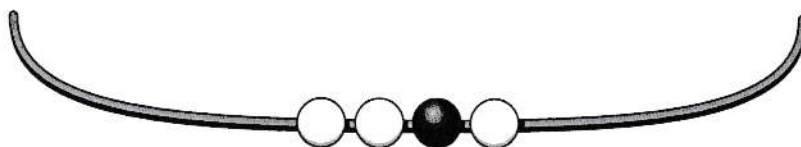
Show your method

[2 marks]

19

On this necklace the ratio of black beads to white beads is 1 : 3

[Extra]

How many **more** black beads do you need to add to make the ratio of black to white 3 : 1?

B : W

1 : 3

\downarrow \downarrow [STAYS THE SAME]

9 : 3

[3 : 1]

\downarrow +8

8 black beads

[1 mark]