

Knowledge Organiser

DIVIDING AN AMOUNT INTO RATIOS

Key Concepts

An amount can be divided into a given ratio.

Red : Green
1 : 3

For every 1 red there are 3 greens.

A ratio can be converted into fractions.

Red : Green
1 : 3

$\frac{1}{4}$ are red and $\frac{3}{4}$ are green.

A woman has £400. She is going to split her money between her two children in the ratio 2:3. How much does each child receive?

No. of boxes (2+3)	↓	$2 : 3$										
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80	:	80										
80		80										
80		80										
		£160	£240									

Child 1 receives £160 and Child 2 receives £240.

There are boys and girls at a party in the ratio 5:2.

There are 15 more boys than girls. Calculate the number of people at the party.

No. of extra Boxes (5-2)	↓	$5 : 2$																
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5	:	2																
5		5																
5		5																
5		5																
5		5																
		15 ÷ 3																
		= 5																
		7 × 5																
		= 35 people																

Examples

Key Words

Ratio
Divide
Parts

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RATIO AND DIRECT PROPORTION

Key Concepts

To calculate the **value** for a single item we can use the **unitary method**.

When working with best value in monetary terms we use:

$$\text{Price per unit} = \frac{\text{price}}{\text{quantity}}$$

In recipe terms we use:

$$\text{Weight per unit} = \frac{\text{weight}}{\text{quantity}}$$

If 20 apples weigh 600g. How much would 28 apples weigh?

$$600 \div 20 = 30\text{g} \quad \text{weight of 1 apple}$$

$$28 \times 30 = \mathbf{840\text{g}}$$

Box A has 8 fish fingers costing £1.40.
Box B has 20 fish fingers costing £ 3.40.
Which box is the better value?



$$A = \frac{\pounds 1.40}{8} = \pounds 0.175$$

$$B = \frac{\pounds 3.40}{20} = \pounds 0.17$$

Therefore Box B is better value as each fish finger costs less.

Examples

The recipe shows the ingredients needed to make 10 Flapjacks.
How much of each will be needed to make 25 flapjacks?

Ingredients for 10 Flapjacks

80 g rolled oats

60 g butter

30 ml golden syrup

36 g light brown sugar

Method 1: Unitary

$$80 \div 10 = 8 \qquad 30 \div 10 = 3$$

$$8 \times 25 = \mathbf{200\text{g}} \qquad 3 \times 25 = \mathbf{75\text{g}}$$

$$60 \div 10 = 6 \qquad 36 \div 10 = 3.6$$

$$6 \times 25 = \mathbf{150\text{g}} \qquad 3.6 \times 25 = \mathbf{90\text{g}}$$

Method 2: 5 flapjacks

$$80 \div 2 = 40 \qquad 30 \div 2 = 15$$

$$40 \times 5 = \mathbf{200\text{g}} \qquad 15 \times 5 = \mathbf{75\text{g}}$$

$$60 \div 2 = 30 \qquad 36 \div 2 = 18$$

$$30 \times 5 = \mathbf{150\text{g}} \qquad 18 \times 5 = \mathbf{90\text{g}}$$

Key Words

Unitary
Best Value
Proportion
Quantity

Ingredients to make 16 gingerbread men

180 g flour
40 g ginger
110 g butter
30 g sugar

1) How much will we need to make 24 gingerbread men?

2) Packet A has 10 toilet rolls costing £3.50.
Packet B has 12 toilet rolls costing £3.60.
Which is better value for money?

3) If 15 oranges weigh 300g. What will 25 oranges weigh?

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DIRECT AND INVERSE PROPORTION

Key Concepts

Variables are **directly proportional** when the **ratio is constant** between the quantities.

Variables are **inversely proportional** when **one quantity increases in proportion to the other decreasing**.

Key Words

Direct
Inverse
Proportion
Divide
Multiply
Constant

Examples

Direct proportion:

Value of A	32	P	56	20	72
Value of B	20	30	35	R	45

Ratio constant: $20 \div 32 = \frac{5}{8}$

From A to B we will multiply by $\frac{5}{8}$.

From B to A we will divide by $\frac{5}{8}$.

$$P = 30 \div \frac{5}{8} = 48$$

$$R = 20$$

$$\times \frac{5}{8} = 12.5$$

Inverse proportion:

Value of A	10	20	14	R	28
Value of B	14	P	10	70	5

$$P = 7$$

$$\times 5$$

$$R = 2$$

Complete each table:

1) Direct proportion

Value of A	5	P	22
Value of B	9	28.8	Q

2) Inverse proportion

Value of A	4	P	18
Value of B	9	3	Q