

Fractions - Finding, Multiplying and Dividing

1. Finding fractions of quantities
2. Multiplying simple fractions
3. Dividing simple fractions

1. Finding a fraction of a quantity

Ex 1 Find $\frac{1}{2}$ of £46

$$\begin{array}{r} 23 \\ 2 \overline{)46} \end{array}$$

£23

To find $\frac{1}{2}$ of a quantity we divide by 2.

The denominator tells us what to divide by

Ex 2 Find $\frac{2}{3}$ of £54

$$\begin{array}{r} 18 \\ 3 \overline{)54} \end{array}$$

$$\begin{array}{r} 18 \\ 2 \times \\ \hline 36 \end{array}$$

= £36

The numerator tells us what to multiply by.

Ex 3

Find $\frac{3}{4}$ of 120 kg

$$\begin{array}{r} 30 \\ 4 \overline{)120} \end{array}$$

$$\begin{array}{r} 30 \\ 3 \times \\ \hline 90 \end{array}$$

90 kg

Ex 4 Find $\frac{3}{5}$ of 80 kg

$$\begin{array}{r} 16 \\ 5 \overline{)80} \end{array}$$

$$\begin{array}{r} 16 \\ 3 \times \\ \hline 48 \end{array}$$

48 kg

2.1

One quantity as a fraction of another

This section will show you how to:

- find one quantity as a fraction of another

Key words

cancel
fraction

An amount often needs to be given as a **fraction** of another amount.

EXAMPLE 1

Write £5 as a fraction of £20.

As a fraction this is written $\frac{5}{20}$. This **cancels** down to $\frac{1}{4}$.

EXERCISE 2A

1 Write the first quantity as a fraction of the second.

- | | |
|--------------------|-----------------------|
| a 2 cm, 6 cm | b 4 kg, 20 kg |
| c £8, £20 | d 5 hours, 24 hours |
| e 12 days, 30 days | f 50p, £3 |
| g 4 days, 2 weeks | h 40 minutes, 2 hours |

2 In a form of 30 pupils, 18 are boys. What fraction of the form consists of boys?

$$\frac{18}{30} = \frac{3}{5}$$

3 During March, it rained on 12 days. For what fraction of the month did it rain?

$$\frac{12}{31}$$

4 Linda wins £120 in a competition. She keeps some to spend and puts £50 into her bank account. What fraction of her winnings does she keep to spend?

$$120 - 50 = £70$$

$$\frac{70}{120} = \frac{7}{12}$$

5 Frank gets a pay rise from £120 a week to £135 a week. What fraction of his original pay was his pay rise?

6 When she was born Alice had a mass of 3 kg. After a month she had a mass of 4 kg 250 g. What fraction of her original mass had she increased by?

7 After the breeding season a bat colony increased in size from 90 bats to 108 bats. What fraction had the size of the colony increased by?

8 After dieting Bart went from 80 kg to 68 kg. What fraction did his weight decrease by?

1a) what Fraction is

$$2\text{cm of } 6\text{cm} = \frac{2}{6} = \frac{1}{3}$$

$$1b) \quad 4\text{kg of } 20\text{kg} = \frac{4}{20} = \frac{1}{5}$$

$$1c) \quad £8 \text{ of } £20 = \frac{8}{20} = \frac{2}{5}$$

$$1d) \quad 5\text{hrs of } 24\text{hrs} = \frac{5}{24}$$

$$1e) \quad 12\text{ days of } 30\text{ days} = \frac{12}{30} = \frac{2}{5}$$

$$1f) \quad \begin{array}{l} 50p \text{ of } £3 \\ = 50p \text{ of } 300p \end{array} = \frac{50}{300} = \frac{5}{30} = \frac{1}{6}$$

$$1g) \quad \begin{array}{l} 4\text{ days of } 2\text{ weeks} \\ = 4\text{ days of } 14\text{ days} \end{array} = \frac{4}{14} = \frac{2}{7}$$

$$1h) \quad \begin{array}{l} 40\text{ mins of } 2\text{ hrs} \\ = 40\text{ mins of } 120\text{ mins} \end{array} = \frac{40}{120} = \frac{4}{12} = \frac{1}{3}$$

Multiplying Simple Fractions

Ex1 $\frac{4}{5} \times \frac{3}{7}$

$$= \frac{4 \times 3}{5 \times 7} = \frac{12}{35}$$

Multiply the numerators
Multiply the denominators

Ex2 $\frac{7}{\cancel{8}_2} \times \frac{\cancel{4}^1}{5}$

$$= \frac{7 \times 1}{2 \times 5} = \frac{7}{10}$$

If possible cancel by a
factor common to a numerator
and a denominator

Ex3 $\frac{\cancel{14}^2}{\cancel{15}_5} \times \frac{\cancel{3}^1}{\cancel{7}_1}$

$$= \frac{2 \times 1}{5 \times 1} = \frac{2}{5}$$

Ex4 $\frac{\cancel{7}^1}{\cancel{18}_6} \times \frac{\cancel{15}^5}{\cancel{21}_3}$

$$= \frac{1 \times 5}{6 \times 3} = \frac{5}{18}$$

Exercise

1) $\frac{\cancel{2}^1}{3} \times \frac{7}{\cancel{10}_5}$

$$= \frac{1 \times 7}{3 \times 5} = \frac{7}{15}$$

2) $\frac{\cancel{10}^5}{17} \times \frac{1}{\cancel{2}_1}$

$$= \frac{5 \times 1}{17 \times 1} = \frac{5}{17}$$

3) $\frac{\cancel{4}^1}{\cancel{8}_1} \times \frac{\cancel{5}^1}{\cancel{8}_2}$

$$= \frac{1 \times 1}{1 \times 2} = \frac{1}{2}$$

4) $\frac{3}{\cancel{8}_4} \times \frac{\cancel{6}^3}{7}$

$$= \frac{3 \times 3}{4 \times 7} = \frac{9}{28}$$

5) $\frac{\cancel{3}^1}{\cancel{4}_1} \times \frac{\cancel{8}^2}{\cancel{15}_5}$

$$= \frac{1 \times 2}{1 \times 5} = \frac{2}{5}$$

You should not use a calculator for this exercise

- 1) Find $\frac{3}{4}$ of 144 kg
- 2) Find $\frac{1}{5}$ of £72.00
- 3) Find $\frac{2}{7}$ of 357 m
- 4) Find $\frac{5}{8}$ of 2000 kg
- 5) Find $\frac{8}{9}$ of £171
- 6) $\frac{4}{5} \times \frac{3}{8}$
- 7) $\frac{6}{7} \times \frac{7}{8}$
- 8) $\frac{9}{10} \times \frac{5}{6}$
- 9) $\frac{3}{4} \times \frac{5}{7}$
- 10) $\frac{2}{3} \times \frac{6}{7}$

FRACTIONS: FINDING, MULTIPLYING AND DIVIDING EXERCISE

- 1) Find $\frac{3}{4}$ of 144 kg

$$4 \overline{) 144}$$

$$\begin{array}{r} 36 \\ 4 \times \\ \hline 108 \end{array}$$

Ans = 108 kg

- 2) Find $\frac{1}{5}$ of £72.00

$$5 \overline{) 72.00}$$

Ans = £14.40

- 3) Find $\frac{2}{7}$ of 357 m

$$7 \overline{) 357}$$

$$\begin{array}{r} 51 \\ 2 \times \\ \hline 102 \end{array}$$

Ans = 102 m

- 4) Find $\frac{5}{8}$ of 2000 kg

$$8 \overline{) 2000}$$

$$\begin{array}{r} 250 \\ 5 \times \\ \hline 1250 \end{array}$$

Ans = 1250 kg

- 5) Find $\frac{8}{9}$ of £171

$$9 \overline{) 171}$$

$$\begin{array}{r} 19 \\ 8 \times \\ \hline 152 \end{array}$$

Ans = £152

$$6) \quad \frac{4}{5} \times \frac{3}{8}$$

$$\frac{\overset{1}{\cancel{4}}}{5} \times \frac{3}{\cancel{8}_2} = \frac{1 \times 3}{5 \times 2} = \frac{3}{10}$$

$$7) \quad \frac{6}{7} \times \frac{7}{8}$$

$$\frac{\overset{3}{\cancel{6}}}{7} \times \frac{\overset{1}{\cancel{7}}}{\cancel{8}_4} = \frac{3 \times 1}{1 \times 4} = \frac{3}{4}$$

$$8) \quad \frac{9}{10} \times \frac{5}{6}$$

$$\frac{\overset{3}{\cancel{9}}}{\cancel{10}_2} \times \frac{\overset{1}{\cancel{5}}}{\cancel{6}_2} = \frac{3 \times 1}{2 \times 2} = \frac{3}{4}$$

$$9) \quad \frac{3}{4} \times \frac{5}{7}$$

$$\frac{3}{4} \times \frac{5}{7} = \frac{3 \times 5}{4 \times 7} = \frac{15}{28}$$

$$10) \quad \frac{2}{3} \times \frac{6}{7}$$

$$\frac{\overset{2}{\cancel{2}}}{3} \times \frac{\overset{2}{\cancel{6}}}{7} = \frac{2 \times 2}{1 \times 7} = \frac{4}{7}$$