Fractions - Finding, Multiplying and Dividing

Finding fractions of quantities

Ex1   Find $\frac{1}{2}$ of £46

$2\overline{\smash{\big)}46}$ with 23 above

$= £23$

To find $\frac{1}{2}$ of something we divide by 2. The denominator tells us what to divide by

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Ex2   Find $\frac{2}{3}$ of £54

$3\overline{\smash{\big)}54}$ with 18 above

18
$\times 2$
36

£36

Denominator $\Rightarrow \div 3$
Numerator $\Rightarrow \times 2$

Ex3   Find $\frac{3}{4}$ of 120 kg

$4\overline{\smash{\big)}120}$ with 30 above

30
$\times 3$
90

90 kg

Ex4   Find $\frac{3}{5}$ of 80 kg

$5\overline{\smash{\big)}80}$ with 16 above

16
$\times 3$
48

48 kg

Multiplying Simple Fractions

Ex 1

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

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

Multiply the numerators and multiply the denominators

Ex 2

$$\frac{7}{8}_{2} \times \frac{4^{1}}{5}$$

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

Ex3

$$\frac{\cancel{14}^{2}}{15} \times \frac{3}{\cancel{7}_{1}}$$

$$= \frac{2 \times 3}{15 \times 1} = \frac{6}{15}$$

Ex4

$$\frac{\cancel{7}^{1}}{\cancel{18}_{6}} \times \frac{\cancel{15}^{5}}{\cancel{21}_{3}}$$

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

Dividing Simple Fractions

To divide by a fraction we simply turn it upside down and multiply instead

Ex1

$$\frac{14}{15} \div \frac{7}{10}$$

$$= \frac{\cancel{14}^{2}}{\cancel{15}_{3}} \times \frac{\cancel{10}^{2}}{\cancel{7}_{1}}$$

$$= \frac{2 \times 2}{3 \times 1} = \frac{4}{3}$$

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

Ex2

$$\frac{7}{18} \div \frac{7}{9}$$

$$= \frac{\cancel{7}^{1}}{\cancel{18}_{2}} \times \frac{\cancel{9}^{1}}{\cancel{7}_{1}}$$

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

Ex3

$$\frac{4}{15} \div \frac{3}{10}$$

$$= \frac{4}{\cancel{15}_{3}} \times \frac{\cancel{10}^{2}}{3}$$

$$= \frac{4 \times 2}{3 \times 3} = \frac{8}{9}$$

Ex 4 $\dfrac{7}{18} \div \dfrac{5}{12}$

$= \dfrac{7}{\underset{3}{\cancel{18}}} \times \dfrac{\cancel{12}^{2}}{5}$

$= \dfrac{7 \times 2}{3 \times 5} = \dfrac{14}{15}$

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

$\begin{array}{r} 36 \\ 4\overline{|14^{2}4} \end{array}$ 36
                        $\dfrac{3\times}{108}$

        108 kg

This section will show you how to:
- find one quantity as a fraction of another

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.

$\frac{2}{6} = \frac{1}{3}$

a 2 cm, 6 cm

$\frac{4}{20} = \frac{1}{5}$

b 4 kg, 20 kg

c £8, £20 $\frac{8}{20} = \frac{2}{5}$

d 5 hours, 24 hours $\frac{5}{24}$

$\frac{12}{30} = \frac{2}{5}$

e 12 days, 30 days

f 50p, £3 $\frac{50}{300} = \frac{1}{6}$

g 4 days, 2 weeks $\frac{4}{14} = \frac{2}{7}$

h 40 minutes, 2 hours $\frac{40}{120} = \frac{1}{3}$

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

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

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?

5 Frank gets a pay rise from £120 a week to £135 a weak. 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?