Basic Use of Percentages

Equivalent Fractions, Percentages, Decimals

Fraction	Percentage	Decimal
1	100%	1.00
$\frac{1}{2}$	50%	0.5
$\frac{1}{4}$	25%	0.25
$\frac{1}{10}$	10%	0.1
$\frac{2}{10} = \frac{1}{5}$	20%	0.2
$\frac{1}{3}$	$33\frac{1}{3}\%$	$0.\dot{3}$
$\frac{2}{3}$	$66\frac{2}{3}\%$	$0.\dot{6}$
$\frac{23}{100}$	23%	0.23
$\frac{89}{100}$	89%	0.89
$\frac{7}{100}$	7%	0.07
$\frac{1}{100}$	1%	0.01
$\frac{129}{100}$	129%	1.29
$\frac{237}{100}$	237%	2.37

Per cent means parts per 100.

Finding Percentages

Ex 1 Non-calc

Find 15% of £64

10% = £6.40

5% = £3.20

15% = £9.60

Ex 2 Find 12½% of £84

= $\frac{1}{8}$ of £84 = $\frac{84}{8}$ = 10.5

= £10.50

Ex 3 Find 40% of 27 Km

10% = 2.7

40% = 10.8 Km

$$\begin{array}{r} 2.7 \\ \times\ 4 \\ \hline 10.8 \end{array}$$

Calculator

Ex 4 Find 83% of £125

125 × 0.83 = £103.75

Ex 5 Find 114% of £66

66 × 1.14 = £75.24

Increasing by a Given Percentage

Ex 1 Increase £63 by 7%

Method 1

Find 7% of £63

63 × 0.07 = £4.41

Method 2

Add 7% to 100%

= 107%

Add to original

£63 + £4.41

= £67.41

Find 107% of £63

63 × 1.07

= £67.41

Ex2 Decrease £46 by 9%

Method 1

Find 9% of £46

46 × 0.09 = £4.14

Subtract from original

£46 − £4.14

= £41.86

Method 2

100% − 9% = 91%

Find 91% of £46

46 × 0.91

= £41.86

Express One Number as a Percentage of Another

Ex1 Express 23 as a percentage of 37

$$\frac{23}{37} \times 100 \quad \%$$

$$= 62.162 \ \%$$

$$= 62.2 \ \%$$

We first express 23 as a fraction of 37 then multiply by 100 to convert a fraction into a percentage.

BASIC USE OF PERCENTAGES — EXERCISE

1. Draw and complete the following table to show equivalent fractions, percentages and decimals.

Fractions	Percentages	Decimals
1	100%	1.00
$\frac{1}{2}$	50%	0.50
	20%	
$\frac{2}{5}$		
		0.43
	6%	
$\frac{1}{3}$		
		0.55
	110%	
$\frac{3}{4}$		
		0.80
	15%	

2.

Non-Calculator	Calculator
a) Find 10% of 44kg	e) Find 17% of 62m
b) Find 5% of £32	f) Find 83% of £83
c) Find 20% of £18	g) Find 4% of 815kg
d) Find 75% of 26m	h) Find 123% of 75m

BASIC USE OF PERCENTAGES — EXERCISE

3. a) Increase £52 by 11%
   b) Decrease £93 by 14%
   c) Increase 77 kg by 7%
   d) Increase 125m by 3%
   e) Decrease £43 by 27%
   f) Increase 30m by 125%
   g) Decrease 85 kg by 1%
   h) Decrease £2500 by 42%

4. a) Express 16 as a percentage of 20

   b) Express 37 as a percentage of 83

   c) A sack contains 82 balls. 53 are red and the rest are blue. What percentage of the balls are red and what percentage are blue?

   d) 772 people take a driving test and 443 pass the test. What percentage of people pass and what percentage of people fail?

BASIC USE OF PERCENTAGES — EXERCISE

1.

Fractions	Percentages	Decimals
1	100%	1.00
$\frac{1}{2}$	50%	0.50
$\frac{2}{10}$ or $\frac{1}{5}$	20%	0.20
$\frac{2}{5}$	40%	0.40
$\frac{43}{100}$	43%	0.43
$\frac{6}{100}$ or $\frac{3}{50}$	6%	0.06
$\frac{1}{3}$	$33\frac{1}{3}\%$	$0.3\dot{3}$
$\frac{55}{100}$ or $\frac{11}{20}$	55%	0.55
$\frac{110}{100}$ or $\frac{11}{10}$	110%	1.10
$\frac{3}{4}$	75%	0.75
$\frac{80}{100}$ or $\frac{4}{5}$	80%	0.80
$\frac{15}{100}$ or $\frac{3}{20}$	15%	0.15

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2. a) 10% of $44\,kg$

$= 4.4\,kg$

b) 5% of £32

$10\% = £3.20$

$\Rightarrow 5\% = £1.60$

c) 20% of £18

$10\% = £1.80$

$\Rightarrow 20\% = £3.60$

d) 75% of $26\,m$

$50\% = 13\,m$

$25\% = 6.5\,m$

$\Rightarrow 75\% = 19.5\,m$

BASIC USE OF PERCENTAGES — EXERCISE

2 cont)

e) 17% of 62m

$62m \times 0.17 = 10.54m$

f) 83% of £83

$£83 \times 0.83 = £68.89$

g) 4% of 815 kg

$815kg \times 0.04 = 32.6kg$

h) 123% of 75m

$75m \times 1.23 = 92.25m$

3. a) $£52 \times 0.11 = £5.72$

$£52 + £5.72 = £57.72$

b) $£93 \times 0.14 = £13.02$

$£93 - £13.02 = £79.98$

c) $77kg \times 0.07 = 5.39kg$

$77kg + 5.39kg = 82.39kg$

d) $125m \times 0.03 = 3.75m$

$125m + 3.75m = 128.75m$

e) $£43 \times 0.27 = £11.61$

$£43 - £11.61 = £31.39$

f) $30m \times 1.25 = 37.5m$

$30m + 37.5m = 67.5m$

g) $85kg \times 0.01 = 0.85kg$

$85kg - 0.85kg = 84.15kg$

h) $£2500 \times 0.42 = £1050$

$£2500 - £1050 = £1450$

4. a) Express 16 as a percentage of 20

$$= \frac{16}{20} \times 100$$

$$= \frac{16}{\cancel{20}_{1}} \times \cancel{100}^{5} \quad = 16 \times 5 \quad = 80\%$$

BASIC USE OF PERCENTAGES — EXERCISE

4 cont) b) Express 37 as a percentage of 83

$$= \frac{37}{83} \times 100 = 44.6\ \%$$

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c) 82 balls, 53 red

Percentage of red $= \frac{53}{82} \times 100 = 64.6\ \%$

Percentage of blue $= 100\% - 64.6\% = 35.4\ \%$

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d) 772 people, 443 pass

Percentage that pass $= \frac{443}{772} \times 100 = 57.4\ \%$

Percentage that fail $= 100\% - 57.4\% = 42.6\ \%$
