



- 1 Write 7 as a fraction of 20.

(1 mark)

7 out of 20 is written as the fraction $\frac{7}{20}$

$$\boxed{\frac{7}{20}}$$

- 2 In a class of 30 pupils, 12 walk to school.
Write 12 as a percentage of 30.

(2 marks)

$$\frac{12}{30} = 0.4$$

$$\boxed{40\%}$$

- 3 Last year a rail season ticket cost £640.
This year the same season ticket costs £688.
Work out the percentage increase in the cost of the season ticket.

(3 marks)

$$\text{Increase} = 688 - 640 = £48$$

Compare the increase with the original £640, which represents 100%. Using the new price as the denominator would answer a different question

$$\text{Percentage increase} = 48 \div 640 = 0.075$$

$$0.075 \times 100 = 7.5\%$$

$$\boxed{7.5\%}$$

- 4 Imani scored 18 out of 40 in a science test.
Work out her score as a percentage.

(2 marks)

$$\frac{18}{40} = 0.45$$

$$\boxed{45\%}$$

- 5 Kane buys a bike for £250.
A year later he sells the bike for £210.
Work out his percentage loss.

(3 marks)

$$\text{Loss} = 250 - 210 = £40$$

$$\text{Percentage Loss} = 40 \div 250 = 0.16$$

$$0.16 \times 100 = 16\%$$

$$\boxed{16\%}$$

- 6 Ayesha buys a second-hand guitar for £80. She sells it for £92.
Work out her percentage profit.

(2 marks)

$$92 - 80 = 12$$

$$\frac{12}{80} \times 100 = 15\%$$

$$\boxed{15\%}$$

- 7 A trader buys a table for £68.
She sells the table for £85.
Work out her percentage profit.

(3 marks)

$$\text{Profit} = 85 - 68 = £17$$

$$\text{Percentage profit} = 17 \div 68 = 0.25$$

$$0.25 \times 100 = 25\%$$

$$\boxed{25\%}$$

- 8 In 2019 Femi bought a flat for £180 000.
In 2026 he sold the flat for £207 000.
Work out his percentage profit.

(3 marks)

$$\text{Profit} = 207000 - 180000 = £27000$$

$$\text{Percentage profit} = 27000 \div 180000 = 0.15$$

$$0.15 \times 100 = 15\%$$

$$\boxed{15\%}$$

- 9 A shop buys phone cases for £3.20 each.
The shop sells each phone case for £4.40.
Show that the shop's percentage profit on each phone case is 37.5%.

(3 marks)

$$\begin{aligned}\text{Profit on each case} &= 4.40 - 3.20 = \text{£}1.20 \\ \text{Percentage profit} &= 1.20 \div 3.20 = 0.375 \\ 0.375 \times 100 &= 37.5\%, \text{ as required}\end{aligned}$$

- 10 Lucy buys plants for £90 and compost for £30. She sells all the plants for a total of £150.
Work out her percentage profit.

(3 marks)

$$\begin{aligned}90 + 30 &= 120 \\ 150 - 120 &= 30 \\ \frac{30}{120} \times 100 &= 25\%\end{aligned}$$

$$\boxed{25\%}$$

- 11 In a quiz, team A scored 36 out of 45 and team B scored 41 out of 50.
Which team scored the higher percentage? You must show your working.

(3 marks)

$$\begin{aligned}\text{A: } \frac{36}{45} &= 0.8 = 80\% \\ \text{B: } \frac{41}{50} &= 0.82 = 82\%\end{aligned}$$

$$\boxed{\text{Team B}}$$

- 12 There are 32 students in a class.
20 of the students walk to school.
Write the fraction of the students who walk to school. Give your fraction in its simplest form.

(2 marks)

$$20 \text{ out of } 32 \text{ students walk, giving } \frac{20}{32}$$

Divide top and bottom by 4

$$\frac{20}{32} = \frac{5}{8}$$

$$\boxed{\frac{5}{8}}$$

- 13 Write $\frac{3}{20}$ as a percentage.

(1 mark)

$$\frac{3}{20} = \frac{15}{100}, \text{ multiplying top and bottom by 5}$$
$$\frac{15}{100} = 15\%$$

15%

- 14 Write 45 minutes as a percentage of 3 hours.

(3 marks)

$$3 \text{ hours} = 180 \text{ minutes}$$

$$\frac{45}{180} = \frac{1}{4}$$

25%

- 15 Dev has 30 pens.

He gives away 12 of the pens.

Write the fraction of the pens that Dev has left. Give your fraction in its simplest form.

(2 marks)

$$\text{Pens Left} = 30 - 12 = 18$$

$$\text{Fraction Left} = \frac{18}{30}$$

Divide top and bottom by 6

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

$\frac{3}{5}$

- 16 Callum buys a house for £150 000. He spends £20 000 on repairs. He then sells the house for £204 000.

Work out his percentage profit.

(4 marks)

$$150000 + 20000 = 170000$$

$$204000 - 170000 = 34000$$

$$\frac{34000}{170000} \times 100 = 20\%$$

20%

17

The membership of running club A increased from 1500 to 1725.

The membership of running club B increased from 2400 to 2700.

Cam says, "Club B had the greater percentage increase because its membership went up by more people."

Show that Cam is wrong.

(4 marks)

$$\text{Club A increase} = 1725 - 1500 = 225, \text{ and } 225 \div 1500 = 0.15 \\ = 15\%$$

$$\text{Club B increase} = 2700 - 2400 = 300, \text{ and } 300 \div 2400 = \\ 0.125 = 12.5\%$$

$15\% > 12.5\%$, so club A had the greater percentage increase and Cam is wrong

18

Freya has 45 marbles.

She gives 9 marbles to her brother.

She then loses 6 marbles.

Work out the fraction of her marbles that Freya has left. Give your fraction in its simplest form.

(3 marks)

$$\text{Marbles left} = 45 - 9 - 6 = 30$$

$$\text{Fraction left} = \frac{30}{45}$$

Divide top and bottom by 15

$$\frac{30}{45} = \frac{2}{3}$$

$$\boxed{\frac{2}{3}}$$