



- 1 A pair of trainers costs £60.

In a sale the price is decreased by 20%.

Work out the sale price. You may use the multiplier 0.8

(2 marks)

20% off leaves 80%: multiplier 0.8

$$60 \times 0.8 = 48$$

£48

- 2 The value of a van is multiplied by 0.88 each year.

Write down the percentage decrease in the value of the van each year.

(1 mark)

A multiplier of 0.88 means the van keeps 88% of its value

$$100\% - 88\% = 12\% \text{ decrease each year}$$

12%

- 3 A coat was £80. In a sale its price is £68.

Work out the percentage reduction in the price.

(3 marks)

$$80 - 68 = £12$$

Percentage change = change $\div$ original $\times 100$

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

$$= 15\%$$

15%

- 4 Dan says, "The multiplier for an 8% increase is 0.08."

Dan is wrong.

- a. Write down the correct multiplier for an 8% increase.
b. Write down the multiplier for an 8% decrease.

(2 marks)

a)

$$100\% + 8\% = 108\%$$

1.08

b)

$$100\% - 8\% = 92\%$$

0.92

- 5 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

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

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

7.5%

- 6 A park had 250 visitors in May and 310 visitors in June.

Work out the percentage increase in the number of visitors.

(3 marks)

$$310 - 250 = 60$$

Percentage change = change ÷ original × 100

$$= \frac{60}{250} \times 100$$

$$= 24\%$$

24%

- 7 Ben's rent is £240 each week.
His rent is increased by 35%.
Work out Ben's new weekly rent.

(3 marks)

10% of 240 is 24, so 30% is $3 \times 24 = 72$

5% is half of 10%, so 5% of 240 is 12

The increase is $72 + 12 = 84$ pounds, so the new rent is $240 + 84 = 324$ pounds

£324

- 8 Jo says, "A reduction of 20% followed by a further reduction of 10% is the same as a single reduction of 30%."

Is Jo correct? You must show your working.

(3 marks)

Start with £100

After 20% off: $100 \times 0.8 = 80$

After 10% off: $80 \times 0.9 = 72$

$100 - 72 = 28\%$ off, not 30%

No, it is 28% off

- 9 The population of a village is 5000.

It increases by 10% in one year. The next year it decreases by 10%.

Gina says the population is now back to 5000. Is she right? Show how you decide.

(3 marks)

$$5000 \times 1.1 = 5500$$

$$5500 \times 0.9 = 4950$$

4950 is not 5000

No, it is 4950

- 10 Ben's monthly electricity bill was £96. It went up by 15%.

Ben's monthly broadband bill was £30. It went up by 40%.

Ben says, "My broadband bill went up by more money than my electricity bill."

Is Ben correct? You must show your working.

(4 marks)

Electricity increase = 15% of £96 = $0.15 \times 96 = £14.40$

Broadband increase = 40% of £30 = $0.4 \times 30 = £12$

$£14.40 > £12$, so Ben is not correct

11 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

12 A jacket costs £220.

In a sale the price is reduced by $\frac{1}{4}$. At the end of the sale the new price is then reduced by a further 20%.

Mia has £130.

Does she have enough money to buy the jacket at the final price? You must show your working.

(4 marks)

First reduction: $\frac{1}{4}$ off

$$220 \div 4 = 55$$

$$220 - 55 = £165$$

Second reduction: 20% off, so $\times 0.8$

$$165 \times 0.8 = £132$$

£132 is more than £130

No, she is £2 short

13

A shop's takings in 2025 were 15% less than its takings in 2024

The shop's takings in 2025 were £61,200

- Work out the shop's takings in 2024
- In 2024, the manager was paid a bonus of 2.5% of the 2024 takings.

Work out the manager's bonus for 2024

(6 marks)

a) A 15% decrease means the 2025 takings are 85% of the 2024 takings

$$\text{a) } 2024 \text{ takings} = 61,200 / 0.85 = 72,000 \text{ pounds}$$

$$\text{b) Bonus} = 2.5\% \text{ of } 72,000 = 0.025 \times 72,000 = 1,800 \text{ pounds}$$