

## Finding Percentage Increase and Decrease

### Starter

1. **(Review of last lesson)** A quantity, 60 m, is increased by 12.7%. Find the new value of the quantity.

**Working:**  $100\% + 12.7\% = 112.7\% \equiv 1.127$   
 $1.127 \times 60 = 67.62 \text{ m}$

- 2.\* A quantity,  $x$ , is increased by  $p\%$ . The new value of the quantity is  $y$ . Write down an equation involving  $p$ ,  $x$  and  $y$ .

**Hint:** use the fraction multiplier method or the “find  $p\%$  and add it to the original value method”

**Working:**  $100\% + p\% \equiv \frac{100 + p}{100}$

**Fraction multiplier method:**  $y = \frac{(100 + p)}{100} \times x = \frac{x(100 + p)}{100}$

**Find  $p\%$  and add it to original value:**  $y = \left( \frac{p}{100} \times x \right) + x = \frac{px}{100} + x$

- E.g. 1** Find the percentage change from: (a) 50 km to 54 km (b) 54 km to 50 km.

**Working:** (a)  $\% \text{ change} = \frac{\text{Difference}}{\text{Original}} \times 100\%$   
 $= \frac{54 - 50}{50} \times 100\%$   
 $= 8\%$

(b)  $\% \text{ change} = \frac{\text{Difference}}{\text{Original}} \times 100\%$   
 $= \frac{54 - 50}{54} \times 100\%$   
 $= 7.41\%$

- E.g. 2** Over a two year period a house increases in value from £145 000 to £205 000. Find the percentage increase.

**Working:**  $\% \text{ increase} = \frac{\text{Difference}}{\text{Original}} \times 100\%$   
 $= \frac{205000 - 145000}{145000} \times 100\%$   
 $= 41.4\%$

**E.g. 3** A motorbike depreciated from £4500 to £3200. Find the percentage depreciation.

**Working:**

$$\begin{aligned}\% \text{ decrease} &= \frac{\text{Difference}}{\text{Original}} \times 100 \% \\ &= \frac{4500 - 3200}{4500} \times 100 \% \\ &= 28.9 \%\end{aligned}$$

**E.g. 4** The Smiths lounge measures 4 m by 3.5 m. They decide to increase its size by extending the longer sides by 2 m and the shorter sides by 1.5 m. Calculate the percentage increase in the area.

**Working:**

$$\begin{aligned}\text{Old area} &= 4 \times 3.5 = 14 \text{ m} \\ \text{New area} &= 6 \times 5 = 30 \text{ m} \\ \% \text{ increase} &= \frac{\text{Difference}}{\text{Original}} \times 100 \% \\ &= \frac{30 - 14}{14} \times 100 \% \\ &= 114 \%\end{aligned}$$

**Video:** [Finding the percentage change](#)

[Solutions to Starter and E.g.s](#)

### Exercise

p162 Ex 9.6 Qu 1-10

[Textbook answers \(only available during a lockdown\)](#)