

## Finding the percentage increase or decrease

### Starter

1. **(Review of last lesson)** Using a calculator:

- (a) increase 839 by 4.7 %                      (f) decrease 194 by 13.6 %

*Do not round your answers.*

**Working:** (a) **Increase** by 4.7 % :  $100\% + 4.7\% = 104.7\% = \frac{104.7}{100} = 1.047$   
 Increase 839 by 4.7 % =  $839 \times 1.047 = 878.433$

(b) **Decrease** by 13.6 % :  $100\% - 13.6\% = 86.4\% = \frac{86.4}{100} = 0.864$   
 Decrease 194 by 13.6 % =  $194 \times 0.864 = 167.616$

2. **(Review of last lesson)** In a long jump competition, Mary's first jump was 6.75 m. Her second jump was a decrease of 7 % on her first jump. Her third jump is an increase of 9 % on her second jump. How far was her third jump? Give your answer to 3 s.f..

**Working:** Decrease by 7 %  $\Rightarrow \times 0.93$   
 Length of second jump =  $6.75 \times 0.93 = 7.2225$  *do not round*  
 Increase by 9 %  $\Rightarrow \times 1.09$   
 Length of third jump =  $6.75 \times 0.93 \times 1.09 = 6.84$  m or 684 cm

3. **(Review of previous material)** Find the percentage change when:

- (a) a price of £10 is increased to £12.  
 (b) a weight of 80 kg is decreased to 68 kg.

**N.B.** Percentage change is worked out *from the original value*.

**Working:** (a) The change is  $12 - 10 = 2$ .  
 The original value is £10.  
 The percentage change =  $\frac{2}{10} \times 100\% = 20\%$

(b) The change is  $80 - 68 = 12$   
 This time the original weight is the larger number i.e. 80 kg  
 The percentage change =  $\frac{12}{80} \times 100\% = 15\%$

**E.g. 1** A car dealer buys a car for £500, gives it a clean, and then sells it for £640. What is the percentage profit?

**Working:** % profit =  $\frac{\text{Change}}{\text{Original}} \times 100\% = \frac{640 - 500}{500} \times 100\% = 28\%$

**E.g. 2** A damaged carpet which cost £180 when new is sold for £100. What is the percentage loss? Give your answer to 3 s.f..

**Working:**  $\% \text{ profit} = \frac{\text{Change}}{\text{Original}} \times 100 \% = \frac{180 - 100}{180} \times 100 \% = 44.4 \% \text{ (3 s.f.)}$

**E.g. 3** A picture has dimensions 20 cm by 10 cm. Calculate the percentage increase in the area of the picture after both length and width are increased by 20 % .

**Working:** Old dimensions are 20 cm by 10 cm so old area is 200 cm<sup>2</sup>.  
Increase by 20 %  $\Rightarrow \times 1.2$   
New length = 20  $\times$  1.2 = 24  
New width = 10  $\times$  1.2 = 12  
New area = 24  $\times$  12 = 288  
 $\% \text{ profit} = \frac{\text{Change}}{\text{Original}} \times 100 \% = \frac{288 - 200}{200} \times 100 \% = 44 \%$

**Video:** [Finding the percentage increase or decrease](#)

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

### Exercise

9-1 class textbook: p29 M2.2 Qu 1-10  
A\*-G class textbook: p27 M2.2 Qu 1-12  
9-1 homework book: p8 M2.2 Qu 1-10  
A\*-G homework book: p6 M2.2 Qu 1-9