

## Year 9 Higher – Percentages

### 1. Non-Calculator – show all workings

a) Find 15% of 80

$$\begin{aligned} 10\% &= 80 \div 10 \\ &= 8 \\ 5\% &= 8 \div 2 \\ &= 4 \\ 15\% &= 8 + 4 = 12 \end{aligned}$$

b) Find 40% of 80

$$\begin{aligned} 10\% &= 8 \\ 40\% &= 4 \times 8 \\ &= 32 \end{aligned}$$

c) Find 65% of 80

$$\begin{aligned} 50\% &= 40 \\ 10\% &= 8 \\ 5\% &= 4 \\ \therefore 65\% &= 40 + 8 + 4 = 52 \end{aligned}$$

d) Find 103% of 80

$$\begin{aligned} 1\% &= 0.8 \\ 3\% &= 2.4 \\ 103\% &= 80 + 2.4 \\ &= 82.4 \end{aligned}$$

---

### 2. Calculator - but you must write down what you input into your calculator

a) Calculate 20% of £340

$$340 \times 0.2 = \pounds 68$$

b) Calculate 33% of £340

$$340 \times 0.33 = \pounds 112.20$$

c) Calculate 12.5% of £340

$$340 \times 0.125 = \pounds 42.50$$

d) Calculate 0.5% of £340

$$340 \times 0.005 = \pounds 1.70$$

3.

Lydia is buying a ring.  
 The ring costs £60  
 She pays a deposit of 40%.  
 Work out how much she pays as the deposit.

Calculator method

$$60 \times 0.4 = \text{£}24.$$

or

$$10\% = 60 \div 10 = 6$$

$$40\% = 6 \times 4 = 24$$

She pays £24 as a deposit

4.

A set of tyres normally costs £500  
 In a sale there is a 30% discount.  
 Work out the sale price of the set of tyres.

Calculator method

$$500 \times 0.7 = \text{£}350$$

or

$$10\% = 50$$

$$30\% = 50 \times 3 = 150$$

$$500 - 150 = \text{£}350$$

5.

There are men and women at a meeting.  
 There are 28 women.  
 30% of the people at the meeting are men.  
 Work out the total number of people at the meeting.

If 30% are men

70% are women

$$\therefore 70\% = 28$$

$$10\% = 4$$

$$\text{and } 100\% = 4 \times 10$$

$$= 40$$

There are 40 people at the meeting

6.

Franco buys a house for £146 500  
 He sells the house for £158 220  
 Calculate the percentage profit Franco makes.

$$\begin{aligned} \% \text{ profit} &= \frac{158220 - 146500}{146500} \times 100 \\ &= 8\% \end{aligned}$$

7

Last year Jo paid £245 for her car insurance.  
 This year she has to pay £883 for her car insurance.  
 Work out the percentage increase in the cost of her car insurance.

$$\begin{aligned} \% \text{ inc} &= \frac{883 - 245}{245} \times 100 \\ &= 260.40816 \dots \\ &= 260\% \end{aligned}$$

- 8 The price of all rail tickets increased by 5%.  
The price of a rail ticket from London to Ipswich increased by £2.30

Work out the price of the ticket before the increase.

$$\begin{aligned} 5\% &= 2.30 \\ 100\% &= 2.30 \times 20 \\ &= \underline{\underline{£46.00}} \end{aligned}$$

9.

In a sale, the price of a TV is reduced by 25%

A week later, the sale price of the TV is reduced by 15%  
The price of the TV is now £293.25

What was the price of the TV before the sale?

$$\begin{aligned} 75\% &= 293.25 \\ 1\% &= 3.45 \\ 100\% &= 345 \\ \hline 75\% &= 345 \\ \therefore 25\% &= 115 \\ 100\% &= 115 \times 4 = \underline{\underline{£460.00}} \end{aligned}$$

Hard Question!

$$\begin{aligned} 293.25 \div 0.85 \div 0.75 \\ = \underline{\underline{£460.00}} \end{aligned}$$

10.

- In a sale, normal prices are reduced by 20%.  
The normal price of a coat is reduced by £15

Work out the normal price of the coat.

$$\begin{aligned} 20\% &= £15 \\ 100\% &= £75 \\ \text{normal price} &= \underline{\underline{£75}} \end{aligned}$$

11.

- In a sale, the normal price of a book is reduced by 30%.  
The sale price of the book is £2.80

Work out the normal price of the book.

$$\begin{aligned} 70\% &= 2.80 \\ 10\% &= 0.40 \\ 100\% &= \underline{\underline{£4.00}} \end{aligned}$$

Two methods -

$$\begin{aligned} 2.8 \div 0.7 \\ = \underline{\underline{£4}} \end{aligned}$$