

Percentages

Per cent means 'out of 100'

So 50% means $\frac{50}{100}$ which simplifies to $\frac{1}{2}$

Similarly:

$$1\% = \frac{1}{100} \quad 10\% = \frac{1}{10} \quad 25\% = \frac{1}{4} \quad 75\% = \frac{3}{4}$$

Ex 1. Find 10% of £23

$$\begin{aligned} &= \frac{1}{10} \text{ of } £23 \\ &= £23 \div 10 \\ &= £2.30 \end{aligned}$$

Ex 2. Find 35% of 480

first find 10% : $480 \div 10 = 48$

$$30\% = 3 \times 10\% \quad \text{so } 30\% = 3 \times 48 = 144$$

$$5\% = \frac{1}{2} \times 10\% \quad \text{so } 5\% = \frac{1}{2} \times 48 = 24$$

$$\text{Now } 35\% = 30\% + 5\% = 144 + 24 = \underline{168}$$

With a calculator:

Ex 1.

32% of 160

$$= \frac{32}{100} \times 160$$

$$= 32 \div 100 \times 160$$

$$= 51.2$$

Ex 2.

7% of £53

$$= 7 \div 100 \times 53$$

$$= £3.71$$

Finding a quantity as a percentage of another.

Ex.

495 students out of 900 are girls. What percentage are girls?

$$\frac{495}{900}$$

$$\times 100 = 495 \div 900 \times 100 = 55\%$$

% increase or decrease: $\frac{\text{difference}}{\text{initial value}} \times 100$

Ex 1.

A chocolate bar increases in price from 60p to 72p.

What is the percentage increase in price?

Difference = increase in price = 12p

Increase as a percentage of original price : $\frac{12}{60} \times 100 = 20\%$

Exercise

- | | | |
|---------------|---------------|---------------|
| 1. 25% of £20 | 2. 20% of £20 | 3. 40% of £40 |
| 4. 10% of £70 | 5. 30% of £70 | 6. 35% of £40 |
| 7. 10% of £90 | 8. 70% of £30 | 9. 45% of £30 |

Answers

- | | | | | | | | |
|----|--------|----|-----|----|-----|----|-----|
| 1. | £5 | 2. | £4 | 3. | £16 | 4. | £7 |
| 5. | £21 | 6. | £14 | 7. | £9 | 8. | £21 |
| 9. | £13.50 | | | | | | |