

Fractions, decimals and percentages – GCSE Mathematics

1. No.9

In a house

the floor area of the living room is 26 m^2 the floor area of the kitchen is 16.4 m^2

Express the area of the living room as a fraction of the area of the kitchen.

Give your answer in its simplest form.

[3 marks]

$$\text{Area} = \frac{\text{Living room}}{\text{Kitchen}}$$

$$= \frac{26\text{ m}^2}{16.4\text{ m}^2}$$

$$= \frac{26 \times 10}{16.4 \times 10}$$

$$= \frac{260}{164}$$

$$\frac{260 \div 2}{164 \div 2}$$

$$= \frac{130 \div 2}{82 \div 2}$$

$$= \frac{65}{41}$$

Answer

$$\frac{65}{41}$$

2. No.21

Prove algebraically that $1.\dot{0}\dot{1}\dot{8} = \frac{56}{55}$

[3 marks]

$$100x = 101.818181$$

$$\text{Let } x = 1.0181818$$

$$100x - x = 101.8181$$

$$99x = 100.8$$

$$\frac{99x}{99} = \frac{100.8 \times 10}{99 \times 10}$$

$$x = \frac{1008 \div 18}{990 \div 18}$$

$$x = \frac{56}{55}$$

3. No.2

The mass of an iceberg is 2 200 000 kg

This value is a 12% reduction from the **original** mass of the iceberg.

Work out the **original** mass of the iceberg.

Give your answer in standard form.

$$100\% - 12\% = 88\%$$

[3 marks]

$$\text{Mass} = 2,200,000 \text{ kg} \rightarrow \text{represents } 88\%$$

$$\frac{2200000 \times 100}{88} = 2,500,000 \text{ kg}$$

$$2,500,000 \text{ kg} \rightarrow 2.5 \times 10^6 \text{ kg}$$

Answer 2.5×10^6 kg

4. No.6

Work out $(2.5 \times 10^4)^{-3}$

Give your answer in standard form.

$$\begin{aligned} & 2.5^{-3} \times (10^4)^{-3} \\ &= 2.5^{-3} \times 10^{-12} \\ &= 0.064 \times 10^{-12} \end{aligned}$$

Answer

$$\begin{aligned} & 6.4 \times 10^{-2} \times 10^{-12} \quad (\text{Add negative indices}) \\ & 6.4 \times 10^{-14} \end{aligned}$$

[1 mark]

$$6.4 \times 10^{-14}$$

5. No.10

A bus route had 90 000 passengers last year.

The number of passengers was predicted to increase

by 3% this year

and then

by 8% next year.

Is the predicted number of passengers for **next** year more than 100 000 ?

You **must** show your working.

[3 marks]

$$\begin{aligned}\text{By this year} &= 1.03 \times 90,000 \text{ (Increase)} \\ &= 92,700\end{aligned}$$

$$\text{Next year} = \frac{108}{100} \times 92700$$

$$= 100,116$$

100,116 is greater than 100,000
so the answer is yes.