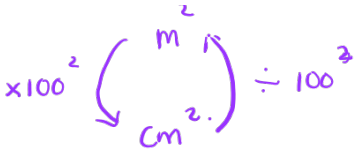
1 Change $1\,m^2$ into cm^2

$1\ m = 100\ cm$

$1\ m^2 = (100\ cm)^2$

$= 10000\ cm^2$ (1)



10 000 ..... cm^2

(Total for Question 1 is 1 mark)

2 A water tank is empty.
Anil needs to fill the tank with 2400 litres of water.

Company **A** supplies water at a rate of 8 litres in 1 minute 40 seconds.
Company **B** supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company **A** would take more time to fill the tank than Company **B** would take to fill the tank.

How much more time?
Give your answer in minutes correct to the nearest minute.

Rate of water supply per litre

Company A = 1 minute 40 second ÷ 8 litres

$= \frac{5}{24}$ minute per litre

Company B : 1 minute ÷ (2.2 × 4.54 ℓ)

$= \frac{250}{2497}$ minute per litre (1)

Time taken to fill the tank

Company A : $\frac{5}{24}$ minute per litre × 2400 litre

= 500 minutes (1)

Company B : $\frac{250}{2497}$ minute per litre × 2400 litre

= 240.28 minutes (1)

260 minutes

(Total for Question 2 is 4 marks)

Company A - Company B

= 500 - 240.28

= 259.71 minute (1)

≈ 260 minute

3 In Spain, Sam pays 27 euros for 18 litres of petrol.
In Wales, Leo pays £40.80 for 8 gallons of the same type of petrol.

1 euro = £0.85
4.5 litres = 1 gallon

Sam thinks that petrol is cheaper in Spain than in Wales.

Is Sam correct?
You must show how you get your answer.

convert Sam's 18 litres into gallons:

4.5 litres : 1 gallon ↓ ×4
18 litres : 4 gallons

scale factor: $\frac{18}{4.5} = 4$

so Sam pays for 4 gallons (1)

convert Sam's 27 euros into pounds:

1 euro : £0.85 ↓ ×27
27 euro : £22.95

scale factor: 27

so sam pays £22.95 for 4 gallons (1)

Sam in Spain:

£22.95 : 4 gallons ↓ ÷4
£5.74 (2dp) : 1 gallon
(1)

Leo in Wales:

£40.80 : 8 gallons ↓ ÷8
£5.10 : 1 gallon

NO, Sam is incorrect as 1 gallon costs £5.74 in spain but £5.10 in wales, which is cheaper. (1)

(Total for Question 3 is 4 marks)

4 Change 30 metres per second to kilometres per hour.

$\frac{30 \text{ metres}}{1 \text{ second}} \div 1000 = \frac{0.03 \text{ km}}{1 \text{ second}}$ (1)

Convert to km

$\frac{0.03 \text{ km}}{1 \text{ second}} \times 3600 = 0.03 \times 3600$

$= 108 \text{ km/h}$ (1)

convert to hour

÷1000

m → km

×1000

1 hour = 60 minutes

1 hour = 60 min × 60 secs

= 3600 secs

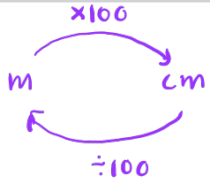
108 ..... kilometres per hour

(Total for Question 4 is 2 marks)

5 Change 9 metres into centimetres.

(9 × 100) cm

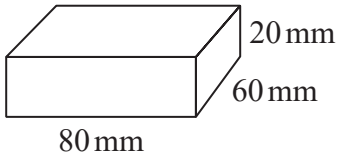
= 900 cm (1)



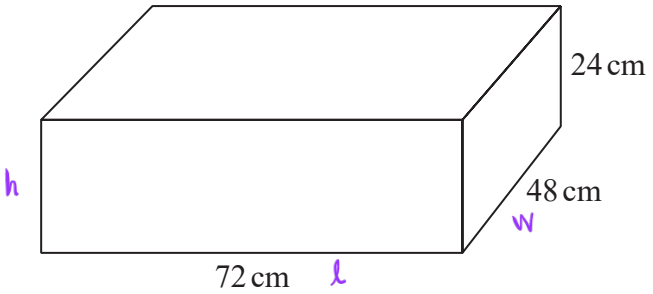
900 ..... centimetres

(Total for Question 5 is 1 mark)

6 Packets of sweets are put into boxes.



Packet

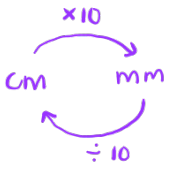


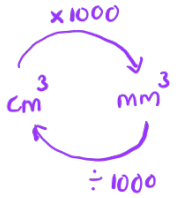
Box

Volume of cuboid = l x w x h

Each packet is a cuboid, 80 mm by 60 mm by 20 mm.
Each box is a cuboid, 72 cm by 48 cm by 24 cm.

Work out the greatest number of packets that can be put into each box.





Calculate volume of box :

$V_B = (72 \times 48 \times 24)$

$= 82\,944\ cm^3$ (1)

Calculate volume of packet :

$V_P = 80 \times 60 \times 20$

$= 96\,000\ mm^3$

Convert to cm^3 $= 96000\ mm^3 \times \frac{1\ cm^3}{1000\ mm^3}$ (1)

$= 96\ cm^3$

Calculate number of packets can fit in the box :

$N = \frac{V_B}{V_P} = \frac{82\,944\ cm^3}{96\ cm^3} = 864$ (1) (1)

864

(Total for Question 6 is 4 marks)

7 Paulo drives at an average speed of 56 km/h for 1 hour 45 minutes.

Work out the distance Paulo drives.

Speed = distance / time

speed = 56 km/h

time = 1 hour 45 minutes

= 1 hour + $\left(\frac{45}{60}\right)$ hour (1)

convert minute to hour

1 hour = 60 minutes

= 1.75 hour

distance = speed x time

= 56 km/h x 1.75 h (1)

= 98 km (1)

98 ..... km

(Total for Question 7 is 3 marks)