1 A rocket travelled $100\,\text{km}$ at an average speed of $28\,440\,\text{km/h}$.

Work out how long it took the rocket to travel the $100\,\text{km}$.
Give your answer in seconds, correct to the nearest second.

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$
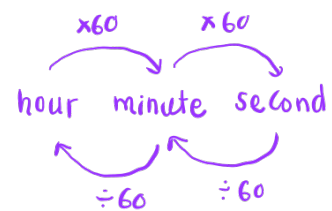
$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

$$= \frac{100\ \text{km}}{28\ 440\ \text{km/h}} \quad ①$$

Convert
✓ h to s

$$= 0.0035\ \text{h} \times \frac{3600\ \text{s}}{1\ \text{h}} \quad ①$$

×60   ×60

hour   minute   second

÷60   ÷60

$$= 12.6\ \text{s}$$

$$= 13\ \text{s} \quad (\text{nearest second})$$
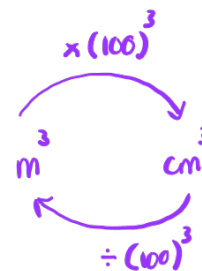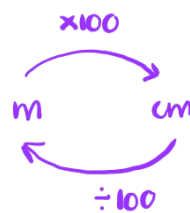
①

.... 13 .... seconds

(Total for Question 1 is 3 marks)

2 Change 32.4 m³ into cm³

$$32.4 \text{ m}^3 \times \frac{(100)^3 \text{ cm}^3}{(1)^3 \text{ m}^3} = 32\ 400\ 000$$

①

①

×100

m ⟶ cm

÷100

×(100)³

m³ ⟶ cm³

÷(100)³

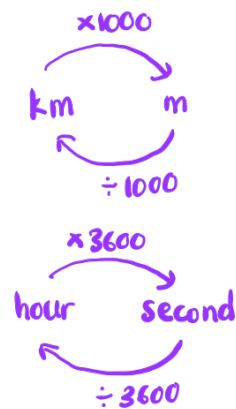32 400 000 cm³

(Total for Question 2 is 2 marks)

3 Change a speed of 50 metres per second to a speed in kilometres per hour.

Convert metres to kilometres :

$$50 \text{ m/s} \times \frac{1 \text{ km}}{1000 \text{ m}} = 0.05 \text{ km/s} \quad ①$$

×1000

km   m

÷1000

Convert second to hour :

$$\frac{0.05 \text{ km}}{1 \text{ s}} \quad ① \quad \times \frac{3600 \text{ s}}{1 \text{ hour}} = 180 \text{ km/h} \quad ①$$
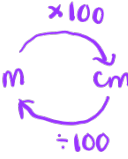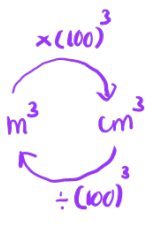
×3600

hour   second

÷3600

180
.... kilometres per hour

(Total for Question 3 is 3 marks)

4 (b) Change $1\,\text{m}^3$ to cm^3

$\times 100$

m $\quad$ cm

$\div 100$

$\times (100)^3$

$\text{m}^3 \quad \text{cm}^3$

$\div (100)^3$

$1\,\text{m}^3 \times \dfrac{(100)^3\,\text{cm}^3}{(1)^3\,\text{m}^3} = 1\ 000\ 000$ ①

.... cm^3

1 000 000

(1)

(Total for Question 4 is 1 marks)

5 Milly went on a car journey.
She travelled from Anesey to Breigh to Clando and then to Duckbridge.

For Anesey to Breigh, Milly drove the 245 km in 2.5 hours.
For Breigh to Clando, Milly drove the 220 km at an average speed of 80 km/h
For Clando to Duckbridge, Milly drove at an average speed of 72 km/h in 50 minutes.

Work out Milly's average speed, in km/h, for the journey from Anesey to Duckbridge.
Give your answer correct to one decimal place.

Breigh to Clando: $\dfrac{220 \text{ km}}{80 \text{ km/h}}$ = 2.75 h ①

Clando to Duckbridge: 72 km/h × $\dfrac{50}{60}$ h

= 60 km ①

Total: $\dfrac{245 + 220 + 60}{2.5 + 2.75 + \dfrac{50}{60}}$ ① = $\dfrac{525}{73/12}$

= 86.3 ①

.... 86.3 .... km/h

(Total for Question 5 is 4 marks)

6 Change a speed of 90 kilometres per hour to a speed in metres per second.
Show your working clearly.

$$90 \ \frac{km}{h} \ \times \ \frac{1000 \ m}{1 \ km} \ \times \ \frac{1 \ h}{3600 \ s}$$

①

$$= \frac{90 \times 1000}{3600}$$

$$= \frac{90 \ 000}{3 \ 600}$$ ①

$$= 25$$ ①

25
.... m/s

(Total for Question 6 is 3 marks)

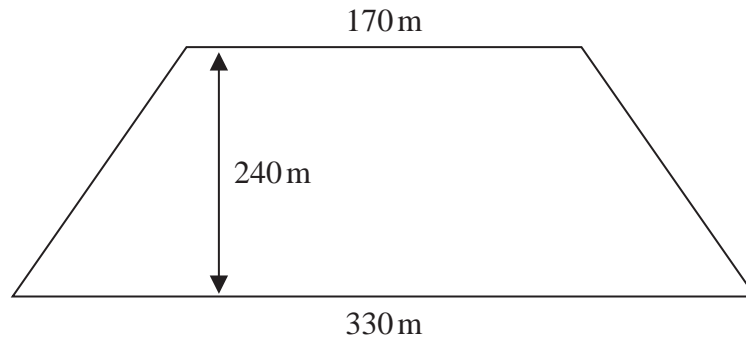**7**   A field is in the shape of a trapezium.

170 m

Diagram **NOT**
accurately drawn

240 m

330 m

The field is sold for a price of $49 650

Given that 1 hectare = $10 000 \, m^2$

work out the average price of the field per hectare.

$$Area = \frac{1}{2} \times 240 \times (170 + 330) \quad ①$$

$$= 120 \times 500$$

$$= 60 \, 000 \, m^2$$

in hectare : $\dfrac{60 \, 000}{10000}$ ①

$$= 6 \, hectares$$

price per hectare = $\dfrac{49 \, 650 \, ①}{6}$ = 8275 ①

$ ____8275____

(**Total for Question 7 is 4 marks**)

8 Change a speed of 27 kilometres per hour to a speed in metres per second.

$$\frac{27 \text{ km}}{1 \text{ hour}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ hour}}{3600 \text{ s}} \quad ①$$

$$= \frac{27\,000 \text{ m}}{3600 \text{ s}} \quad ① \qquad = 7.5 \text{ m/s} \quad ①$$

7.5

.... m / s

(Total for Question 8 is 3 marks)