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.

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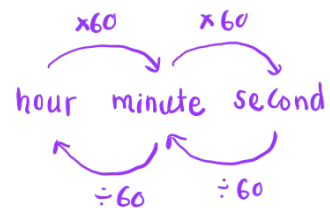
$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

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

Convert
h to s

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

$$= 12.6 \text{ s}$$

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

$$①$$

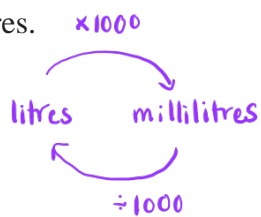×60   ×60

hour   minute   second

÷60   ÷60

13
.... seconds

(Total for Question 1 is 3 marks)

2 (a) Change 3 litres into millilitres.   ×1000

3×1000

$= 3000$ ①

litres   millilitres

÷1000

.....................................3000........................millilitres
(1)

(b) Change 6500 grams into kilograms.

$\dfrac{6500}{1000} = 6.5 \text{ kg}$ ①

÷1000

g   kg

×1000
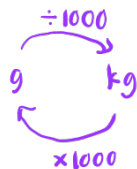
.....................................6.5........................kilograms
(1)

(Total for Question 2 is 2 marks)

3 (a) Complete the following sentences by writing a sensible metric unit on each of the dotted lines.

(i) The distance from Cairo to Nairobi is 5211 ...... *kilometres (km)* ①

(ii) The weight of an egg is 20 ...... *grams (g)* ① ......

(iii) The area of the floor of a classroom is 260 *square metres (m²)* ①

(3)
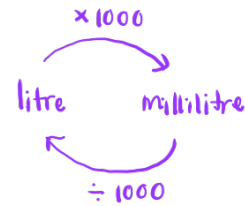
Cara has a bottle of juice.
There is 1 litre of juice in the bottle.

Cara makes some drinks.
She uses exactly 30 millilitres of this juice to make each drink.

Cara makes as many drinks as possible.

(b) How many drinks does Cara make?

× 1000

litre   millilitre

÷ 1000

1 litre × 1000 = 1000 ml   (convert ℓ to mℓ) ①

$\dfrac{1000}{30}$ = 33.3 ①

= 33 (convert to nearest whole number)
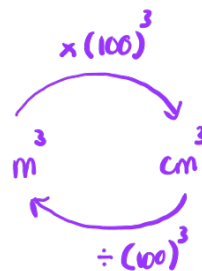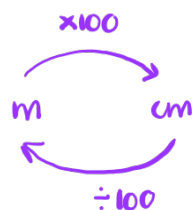
∴ Cara can make 33 drinks. ①

33

(3)

(Total for Question 3 is 6 marks)

4 Change 32.4 m^3 into cm^3

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

①

①

$\times 100$

m   cm

$\div 100$

$\times (100)^3$

m^3 cm^3

$\div (100)^3$

32 400 000

.... cm^3
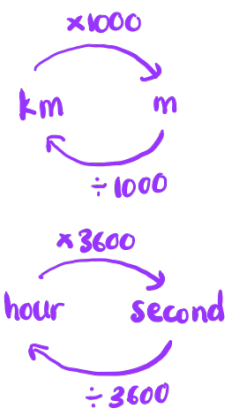
(Total for Question 4 is 2 marks)

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

convert metres to kilometres :

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

convert second to hour :

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

$$\times 1000$$

km ⟶ m

$$\div 1000$$

$$\times 3600$$

hour ⟶ second

$$\div 3600$$

180 .... kilometres per hour

(Total for Question 5 is 3 marks)

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

$\times 100$

m cm

$\div 100$

$\times (100)$

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

$\div (100)^3$

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

.................1·000·000............ cm^3

(1)

(Total for Question 6 is 1 marks)

7 (d) Complete the following sentence by writing a suitable metric unit on the dotted line.

The length of a pen is 16 .... **Centimetres** (1) ....

(1)

(Total for Question 7 is 1 marks)

8 Change a speed of 81 kilometres per hour to a speed in metres per second.

$$\frac{81 \text{ km}}{h} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 h}{60 \times 60 \text{ s}} \quad ①$$

$$= \frac{81\,000}{3600} \quad ①$$

$$= 22 \cdot 5 \quad ①$$

22·5 .... metres per second

(Total for Question 8 is 3 marks)

9 (a) Change 6 metres into centimetres.

$6 \times 100 = 600$

600 (1) centimetres

(1)

(b) Change 4500 grams into kilograms.

$4500 \div 1000 = 4.5$

4.5 (1) kilograms

(1)

Lauren has 3 litres of fruit juice.
She is going to use the fruit juice to make some drinks for a party.
Each cup of drink will contain 225 millilitres of fruit juice.

Lauren is going to make as many cups of drink as possible.

(c) Work out how much fruit juice Lauren has left when she has made as many cups of
drink as possible.
Give your answer in millilitres.

$3 \times 1000 = 3000$ (1)

$\dfrac{3000}{225} = 13.3$ (1)

≈ 13 cups

$3000 - (13 \times 225)$ (1)

$= 3000 - 2925$

$= 75$ (1)

75 millilitres

(4)

(Total for Question 9 is 6 marks)

10 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 $\times \dfrac{50}{60}$ 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 10 is 4 marks)

11   Mairi has a 2 metre length of string.
She cuts from the string as many lengths of 35 centimetres as possible.

Work out the length of string that she has left.
Give your answer in centimetres.

$$2m \times \frac{100 \text{ cm}}{1 \text{ m}} = 200 \text{ cm} \quad \text{①}$$

$$\frac{200 \text{ cm}}{35 \text{ cm}} = 5.714\ldots$$

$$= 5 \text{ strings}$$

$$5 \times 35 = 175 \text{ cm} \quad \text{①}$$

$$200 - 175 = 25 \quad \text{①}$$

25 .... cm

(Total for Question 11 is 3 marks)

12 Iman walked for 3 hours 15 minutes.
He walked a distance of 18.2 kilometres.

Work out Iman's average speed for his walk.
Give your answer in km/h

$$3 \text{ hours} \times \frac{15}{60} \text{ hours}$$

$$= 3.25 \text{ hours} \quad ①$$

$$\text{Speed} = \frac{18.2 \text{ km}}{3.25 \text{ hr}} \quad ①$$

$$= 5.6 \quad ①$$

5.6

.... km/h

(Total for Question 12 is 3 marks)

13 (d) Change 3.6 metres into centimetres.

$3.6 \times 100 = 360$

360

.... cm

(1)

(Total for Question 13 is 1 marks)

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

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

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

$$= \frac{90\ 000}{3\ 600}$$

$$= 25$$

25

.... m/s

(Total for Question 14 is 3 marks)

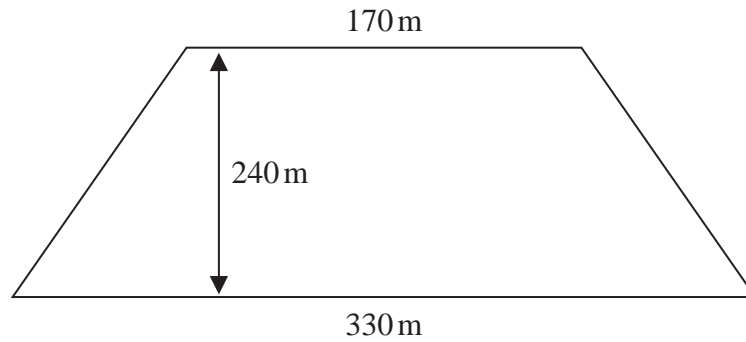**15** A field is in the shape of a trapezium.

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 m²

work out the average price of the field per hectare.

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

$$= 120 \times 500$$

$$= 60\,000 \text{ m}^2$$

$$\text{in hectare} = \frac{60\,000}{10000} \quad ①$$

$$= 6 \text{ hectares}$$

$$\text{price per hectare} = \frac{49\,650 \quad ①}{6} = 8275 \quad ①$$

8275

$ ....

(Total for Question 15 is 4 marks)

.... m / s

16 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 16 is 3 marks)