1 A train travels x miles in 2 hours.

miles is a unit for distance, hours is a unit for time

(b) Write down an expression, in terms of x, for the average speed of the train.

speed = distance / time

x miles ÷ 2 hrs

$= \frac{x}{2}$ miles per hour

(1) $\frac{x}{2}$ ..... miles per hour

(1)

(Total for Question 1 is 1 marks)

2 Jenny drives from London to Swindon at an average speed of 54 miles per hour.

She drives for $1\frac{1}{2}$ hours.

$1\frac{1}{2}$ h = 1.5 hours

(a) Work out the distance from London to Swindon.

distance = speed x time

distance = 54 miles/h x 1.5 h (1)

= 81 miles (1)

54 x 15 = 270 + 540 = 810

81 ..... miles

(2)

Aleksy is using a map.

The map has a scale of 1 : 25 000

On the map a road has a length of 6 cm.

(b) Work out the length, in kilometres, of the real road.

CONVERSION

km ×1000 m ×100 cm

km ÷1000 m ÷100 cm

1 cm : 25 000 cm

×6 ×6

6 cm : 150 000 cm (1)

$= \frac{150\,000 \text{ cm}}{100\,000 \frac{\text{cm}}{\text{km}}}$ (1)

= 1.5 km (1)

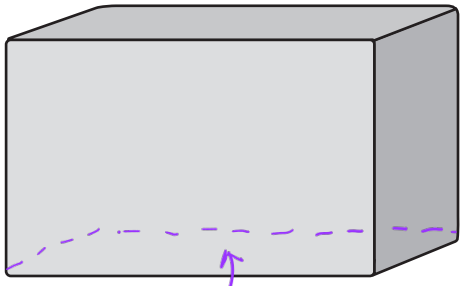
25 000 x 6 = 150 000

1.5 ..... kilometres

(3)

(Total for Question 2 is 5 marks)

3



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

A storage tank exerts a force of 10 000 newtons on the ground.

The base of the tank in contact with the ground is a 4 m by 2 m rectangle.

Work out the pressure on the ground due to the tank.

Method of finding area of base of the tank

$4\text{ m} \times 2\text{ m} = 8\text{ m}^2$

Pressure on the ground : $\frac{10\,000\text{ N}}{8\text{ m}^2}$ (1)

$= 1250\text{ Nm}^{-2}$ (1)

$$\begin{array}{r} 1250 \\ 8\overline{)10\,000} \\ -8 \\ \hline 20 \\ -16 \\ \hline 40 \\ -40 \\ \hline \end{array}$$

1250 ..... newtons / m^2

(Total for Question 3 is 2 marks)

4 A solid cuboid is made of metal.

density = mass / volume

The metal has a density of 9 g/cm^3
The volume of the cuboid is 72 cm^3

Work out the mass of the cuboid.

mass = density x volume

= 9 g/cm^3 x 72 cm^3 (1)

= 648 g (1)

648 ..... g

(Total for Question 4 is 2 marks)