



1

- Change 3.2 kg to grams.
- Change 450 cm to metres.
- Change 2.5 litres to millilitres.
- Leah buys 3 bags of flour. Each bag has a mass of 1.25 kg. Work out the total mass of the flour in grams.

(4 marks)

$$a) 1 \text{ kg} = 1000 \text{ g}$$

$$3.2 \times 1000 = 3200$$

$$3200 \text{ g}$$

$$b) 100 \text{ cm} = 1 \text{ m}$$

$$450 \div 100 = 4.5$$

$$4.5 \text{ m}$$

$$c) 1 \text{ Litre} = 1000 \text{ mL}$$

$$2.5 \times 1000 = 2500$$

$$2500 \text{ mL}$$

d)

$$3 \times 1.25 = 3.75 \text{ kg}$$

$$3.75 \times 1000 = 3750$$

$$3750 \text{ g}$$

2

Change 3.5 m^2 to cm^2 .

(1 mark)

$$1 \text{ m}^2 = 100 \text{ cm} \times 100 \text{ cm} = 10\,000 \text{ cm}^2$$

$$3.5 \times 10\,000 = 35\,000 \text{ cm}^2$$

$$35000 \text{ cm}^2$$

3

A model of a car is made to a scale of 1 : 24.

- The model is 18 cm long. Work out the length of the real car in metres.
- The real car is 1.44 m high. Work out the height of the model in centimetres.

(3 marks)

$$\text{Real} = 24 \times \text{model}$$

a)

$$18 \times 24 = 432 \text{ cm}$$

$$432 \div 100 = 4.32$$

$$4.32 \text{ m}$$

b)

$$1.44 \text{ m} = 144 \text{ cm}$$

$$144 \div 24 = 6$$

$$6 \text{ cm}$$

4

Here is part of a bus timetable.

Bus station	07:45	08:15	08:50
Market Square	07:58	08:28	09:03
Park Road	08:06	08:36	09:11
Oakfield School	08:19	08:49	09:24

- a. How many minutes does the 07:45 bus take to get from the Bus station to Oakfield School?
- b. Kemi gets on the bus at Market Square. She must be at Oakfield School by 08:45. Write down the time of the latest bus she can catch from Market Square.
- c. How many minutes are there between the first bus and the second bus at Park Road?

(3 marks)

a)

07:45 to 08:00 = 15 min

08:00 to 08:19 = 19 min

 $15 + 19 = 34$

34 minutes

b)

08:28 bus arrives 08:49: too late

07:58 bus arrives 08:19: in time

07:58

c)

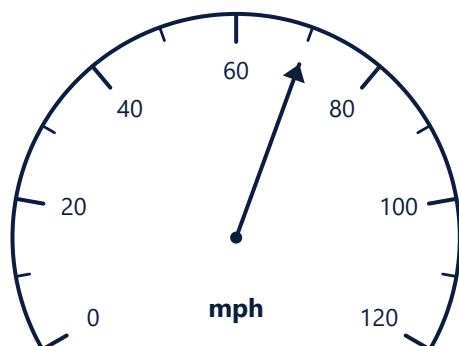
08:06 to 08:36 = 30 min

30 minutes

5

The diagram shows the speedometer of a car.

- Write down the speed shown on the speedometer.
- Use 5 miles = 8 kilometres to change this speed to km/h.



(3 marks)

a) Each small mark = 10 mph

Halfway between 60 and 80

70 mph

b)

$$70 \div 5 = 14$$

$$14 \times 8 = 112$$

112 km/h

6

A block of pine wood has a volume of 240 cm^3 .

The density of the pine wood is 0.65 g/cm^3 .

Work out the mass of the block.

(2 marks)

Use mass = density $\times$ volume

$$\text{Mass} = 0.65 \times 240 = 156 \text{ g}$$

156 g

7

Amber runs 15.6 km in 1 hour 30 minutes.

Work out her average speed in km/h.

(3 marks)

Convert the time to hours

$$1 \text{ hour } 30 \text{ minutes} = 1.5 \text{ hours}$$

$$\text{Use speed} = \text{distance} \div \text{time}$$

$$\text{Speed} = 15.6 \div 1.5 = 10.4 \text{ km/h}$$

$$10.4 \text{ km/h}$$

8

Mr Hussain drives 135 miles on a motorway at an average speed of 45 mph.

a. Work out how long this part of the journey takes.

He then drives for 1 hour 20 minutes at an average speed of 60 mph.

b. Work out the distance he drives in this part.

c. Work out his average speed for the whole journey. Give your answer correct to 1 decimal place.

(4 marks)

$$a) T = D \div S$$

$$135 \div 45 = 3$$

$$3 \text{ hours}$$

$$b) 20 \text{ minutes} = \frac{1}{3} \text{ hour}$$

$$D = S \times T$$

$$60 \times 1\frac{1}{3} = 80$$

$$80 \text{ miles}$$

c)

$$\text{Distance: } 135 + 80 = 215$$

$$\text{Time: } 3 + 1\frac{1}{3} = 4\frac{1}{3} \text{ hours}$$

$$215 \div 4\frac{1}{3} = 49.61...$$

$$49.6 \text{ mph}$$

9

A cheetah runs 150 m in 5 seconds.

a. Work out its average speed in metres per second.

b. Change your answer to kilometres per hour. Use speed in km/h = speed in m/s $\times \frac{60 \times 60}{1000}$

(3 marks)

$$a) S = D \div T$$

$$150 \div 5 = 30$$

$$30 \text{ m/s}$$

b)

$$30 \times 60 \times 60 = 108\,000 \text{ m per hour}$$

$$108\,000 \div 1000 = 108$$

$$108 \text{ km/h}$$

10

Water flows out of a pipe at a rate of 0.9 m^3 per minute.

$$1 \text{ m}^3 = 1000 \text{ litres}$$

Work out the rate of flow in litres per second.

(4 marks)

Change to litres

$$0.9 \text{ m}^3 = 0.9 \times 1000 = 900 \text{ litres per minute}$$

Change to seconds

$$900 \div 60 = 15 \text{ litres per second}$$

$$15 \text{ litres per second}$$

- 11 A go-kart is moving at 4 m/s. It speeds up with an acceleration of 2.5 m/s² for 6 seconds.

Use the formulae

$$v = u + at \quad s = ut + \frac{1}{2}at^2$$

where u is the starting speed, v is the final speed, a is the acceleration, t is the time and s is the distance travelled.

- Work out the speed of the go-kart after 6 seconds.
- Work out the distance it travels in the 6 seconds.

(4 marks)

$$u = 4, a = 2.5, t = 6$$

a)

$$v = 4 + 2.5 \times 6$$

$$v = 4 + 15 = 19$$

$$\boxed{19 \text{ m/s}}$$

b)

$$s = 4 \times 6 + \frac{1}{2} \times 2.5 \times 6^2$$

$$s = 24 + \frac{1}{2} \times 2.5 \times 36$$

$$s = 24 + 45 = 69$$

$$\boxed{69 \text{ m}}$$

- 12 A paperweight is made of brass with a volume of 60 cm³.

The density of brass is 8.4 g/cm³.

A delivery box can hold a total mass of at most 4.5 kg.

Work out the greatest number of these paperweights the box can hold.

(3 marks)

$$\text{Mass of one paperweight} = 8.4 \times 60 = 504 \text{ g}$$

Convert the limit

$$4.5 \text{ kg} = 4500 \text{ g}$$

$$4500 \div 504 = 8.92\dots, \text{ so the greatest number is } 8$$

$$\boxed{8}$$