

### 1 Time intervals

- a) A flight leaves Tokyo at 10:35 Tokyo time and lands in London at 15:10 London time, the same day. London is 8 hours behind Tokyo. How long is the flight?
- b) A clock loses 3 minutes every 2 hours. It is set right at 09:00. What is the real time when it shows 21:00? Give it to the nearest minute.

a) 10:35 in Tokyo is 02:35 in London

02:35 to 15:10 = 12 h 35 min

b) it shows 117 min for every 120 real

$$720 \times 120 \div 117 = 738.5 \text{ min}, 21:18$$

### 2 Converting metric units

- a) Write  $3.6 \times 10^5$  mg in kg.
- b) A hair is 0.08 mm wide. How many hairs side by side make 2.4 m? Give your answer in standard form.

$$a) \div 1000 = 360 \text{ g}, \div 1000 = 0.36 \text{ kg}$$

$$b) 2.4 \text{ m} = 2400 \text{ mm}$$

$$2400 \div 0.08 = 30\,000 = 3 \times 10^4$$

### 3 Converting units of area and volume

- a) 12 mm of rain falls on a flat roof 8 m by 5 m. How many litres of water is that?
- b) Write  $2.5 \text{ km}^2$  in  $\text{cm}^2$ , in standard form.

$$a) 0.012 \times 8 \times 5 = 0.48 \text{ m}^3$$

$$0.48 \times 1000 = 480 \text{ litres}$$

$$b) 1 \text{ km} = 10^5 \text{ cm}, 1 \text{ km}^2 = 10^{10} \text{ cm}^2$$

$$2.5 \times 10^{10} \text{ cm}^2$$

### 4 Speed, distance and time

Lily walks to school. At 5 km/h she is 6 minutes late. At 6 km/h she is 4 minutes early.

- a) How far does she walk?
- b) How long does she have to get there?

$$a) \frac{d}{5} - \frac{d}{6} = \frac{10}{60} \text{ h}, \frac{d}{30} = \frac{1}{6}$$

$$d = 5 \text{ km}$$

$$b) 5 \div 5 = 1 \text{ h}, 60 - 6 = 54 \text{ minutes}$$

### 6 Density

Brass is made from 300 g of copper (density  $8.96 \text{ g/cm}^3$ ) and 200 g of zinc (density  $7.13 \text{ g/cm}^3$ ).

- a) Work out the density of the brass, to 3 significant figures.
- b) Ali works out  $\frac{3 \times 8.96 + 2 \times 7.13}{5}$ . Explain his mistake.

$$a) \text{volumes } 300 \div 8.96 = 33.48, 200 \div 7.13 = 28.05$$

$$500 \div 61.53 = 8.13 \text{ g/cm}^3$$

b) it is mixed 3 : 2 by mass, not by volume

### 7 Pressure

This solid cylinder weighs 1200 N. It stands on its flat face.

- a) Work out the pressure on the floor, to 3 significant figures.
- b) A cylinder of the same height and metal has twice the radius. Show its pressure is the same.



$$a) 1200 \div (\pi \times 0.3^2) = 4240 \text{ N/m}^2$$

b) weight  $\times 4$  and area  $\times 4$ , so the same

### 5 Speed, distance and time

Two towns are 255 km apart. Train A leaves one at 11:00 at 90 km/h. Train B leaves the other at 11:30 at 80 km/h. They head towards each other.

- a) At what time do they meet, to the nearest minute?
- b) How far from its start is train A then, to 3 significant figures?

$$a) \text{ by 11:30 A has gone 45 km, gap 210 km}$$

$$210 \div 170 = 1.2353 \text{ h} = 74.1 \text{ min}, 12:44$$

$$b) 90 \times 1.7353 = 156 \text{ km}$$

### 8 Calculator answers: money and time

- a) Kim is paid £13.20 an hour, and time and a half for every hour after 37.5 hours. One week she works 42 hours 20 minutes. Work out her pay.
- b) A machine makes 7 bolts every 12 seconds. How long does it take to make 5000 bolts? Give your answer in hours, minutes and seconds.

$$a) \text{overtime } 4 \text{ h } 50 \text{ min} = 4.833... \text{ h}$$

$$37.5 \times 13.20 + 4.833... \times 19.80 = \text{£}590.70$$

$$b) 5000 \times 12 \div 7 = 8571.4 \text{ s}$$

$$2 \text{ h } 22 \text{ min } 51 \text{ s}$$

## Measure revision mat answers