1 Convert 11.2 kilometres into miles.

Use 8 km = 5 miles

[2 marks]

$\frac{11.2}{8} \times 5 = 1.4 \times 5$ (1)

$= 7$ (1)

Answer 7 miles

2 The heel of a shoe exerts a pressure of 198 pounds per square inch.

Convert this pressure into kilograms per square centimetre.

Use

1 pound = 0.45 kilograms

1 square inch = 6.25 square centimetres

[3 marks]

$$\frac{198 \text{ pound}}{1 \text{ inch}^2} \times \frac{0.45 \text{ kg}}{1 \text{ pound}} \times \frac{1 \text{ inch}^2}{6.25 \text{ cm}^2}$$

$$= \frac{198 \times 0.45}{6.25} \quad (1)$$

$$= \frac{89.1}{6.25} \quad (1) \quad = 14.256 \quad (1)$$

Answer 14.256 kg/cm^2

3 Tom and Adil are the two runners in a 200-metre race.

Tom completes the race in 24 seconds.

Adil completes the race at an average speed of 28.8 kilometres per hour.

Who wins the race?

You **must** show your working.

[3 marks]

Speed in m/s :

$\text{Tom} = \frac{200\ \text{m}}{24\ \text{s}} = 8.33\ \text{ms}^{-1}$ (1)

$\text{Adil} = \frac{28.8\ \text{km}}{1\ \text{hour}} \times \frac{1000\ \text{m}}{1\ \text{km}} \times \frac{1\ \text{hour}}{3600\ \text{s}}$

$= 8\ \text{ms}^{-1}$ (1)

Tom wins. (1)

Answer Tom

4 Convert 7 gallons to litres.

Use 1 gallon = 4.5 litres

[2 marks]

$7 \times 4.5 = 31.5$ (1) (1)

Answer 31.5 litres

5 Jamil is on holiday in France.

5 (a) The cost of a room in a hostel is 27 euros.

Convert the cost to £

Use £1 = 1.2 euros

[2 marks]

$\frac{27}{1.2}$ (1) $= 22.50$ (1)

Answer £ 22.50

5 (b) Jamil rides a motorbike.

The motorbike uses one litre of petrol for every 14 miles.

How many litres of petrol does the motorbike use to go 168 kilometres?

Use 8 kilometres = 5 miles

[3 marks]

$\frac{168 \text{ km}}{8 \text{ km}} \times 5 \text{ miles} = 105 \text{ miles}$

$\frac{105 \text{ miles}}{14 \text{ miles}} = 7.5$ (3)

Answer 7.5 litres

6 (a) Complete the statement. **[1 mark]**

m → cm ×100

2m × 100 = 200 cm

2 metres = 200 centimetres

6 (b) Complete the statement. **[1 mark]**

kg → g ×1000

8 kg × 1000 = 8000 g

8 kilograms = 8000 grams

6 (c) Convert 24 kilometres to miles.

Use 8 kilometres = 5 miles

[2 marks]

$\frac{3}{24}$ km × $\frac{5 \text{ miles}}{\cancel{8}_{1} \text{ km}}$ = 15 miles

Answer 15 miles

7 Town A has

a population of 84 000

an area of 7 **square miles**.

Town B has a population density of 4695 people per **square kilometre**.

$$\text{Population density} = \frac{\text{population}}{\text{area}}$$

Which town has the greater population density?

Use 1 square mile = 2.6 square kilometres

Tick a box.

Town A ☐ Town B ☑

Show working to support your answer.

[3 marks]

Town A area = 7 × 2.6 square km

= 18.2 square km

Town A population density = $\frac{84000}{18.2}$ = 4615 people per square km (2)

∴ Town B has greater population density (1)