

Chapter 6 Ratio and Proportion Ex 6.4

Question 1.

Convert the following speeds into m/sec:

(i) 72 km/h

(ii) 9 km/h

(iii) 1.2 km/minutes

(iv) 600 m/hour

Solution:

(i) 72 km/h

1 km = 1000 m

and 1 h = 3600 sec.

$$\frac{1 \text{ km}}{h} = \frac{1000}{3600} = \frac{5}{18} \text{ m/s}$$

$$\therefore 72 \text{ km/h} = \frac{5}{18} \times 72 \text{ m/sec}$$

$$= 20 \text{ m/sec}$$

(ii) 9 km/h

1 hour = 3600 sec.

1 km = 1000 m

$$\frac{1 \text{ km}}{m} = \frac{1000}{3600} = \frac{5}{18} \text{ m/s}$$

$$\therefore 9 \text{ km/h} = \frac{5}{18} \times 9 \text{ m/sec}$$

$$= \frac{5}{2} \text{ or } 2.5 \text{ m/sec}$$

(iii) 1.2 km/minutes

1 hour = 60 minutes

1.2 km/min. = 1.2×60 km/hr

Now, $\frac{1 \text{ km}}{h} = \frac{5}{18} \text{ m/s}$

$$1.2 \times 60 \text{ km/h} = 1.2 \times 60 \times \frac{5}{18} \text{ m/sec}$$

$$= 72 \times \frac{5}{18} \text{ m/sec} = 20 \text{ m/sec}$$

(iv) 600 m/hour

$$= \frac{600}{1000} \text{ km/h} = \frac{600 \times 5}{1000 \times 18} \text{ m/sec}$$

$$= \frac{1}{6} \text{ m/sec}$$

Question 2.

Convert the following speeds into km/h:

(i) 15 m/sec

(ii) 1.5 m/sec

Solution:

(i) 15 m/sec

$$1 \text{ m} = \frac{1}{1000} \text{ km}$$

$$1 \text{ sec.} = \frac{1}{3600} \text{ hours}$$

$$\frac{1 \text{ m}}{\text{s}} = \frac{1}{1000} \div \frac{1}{3600} = \frac{3600}{1000}$$

$$= \frac{18}{5} \text{ km/h}$$

$$\therefore 15 \text{ m/s} = 15 \times \frac{18}{5} \text{ km/h} = 54 \text{ km/h}$$

(ii) 1.5 m/sec

$$1 \text{ m} = \frac{1}{1000} \text{ km}$$

$$1 \text{ sec.} = \frac{1}{3600} \text{ hours}$$

$$\frac{1 \text{ m}}{\text{s}} = \frac{1}{1000} \div \frac{1}{3600} = \frac{3600}{1000}$$

$$= \frac{18}{5} \text{ km/h}$$

$$\therefore 1.5 \text{ m/s} = 1.5 \times \frac{18}{5} \text{ km/h} = 5.4 \text{ km/h}$$

Question 3.

Which is greater- the speed of 30 m/sec or 30 km/h?

Solution:

Which is greater

$$m/s = \frac{18}{5} \text{ km/h}$$

$$30 \text{ km/h} = \frac{18}{5} \times 30 = 108 \text{ km/h}$$

That means 108 km cover in 1 hour 30 m/sec is greater

Question 4.

An aeroplane is flying at a speed of 720 km/h.

(i) If the aerial distance between two cities is 1800 km, how much time will the aeroplane take in crossing these cities?

(ii) How much distance does the aeroplane cover in 40 minutes?

(iii) How far will it fly in 15 seconds?

Solution:

Speed of an aeroplane = 720 km/h

(i) Distance between two cities = 1800 km

$$\text{Time taken} = \frac{D}{S}$$

$$= \frac{1800}{720} \text{ hours}$$

$$= \frac{5}{2} \text{ hours}$$

$$= 2\frac{1}{2} \text{ hours}$$

(ii) Time = 40 min

$$= \frac{40}{60}$$

$$= \frac{2}{3} \text{ h}$$

Distance travelled = Time \times Speed

$$= \frac{2}{3} \times 720$$

$$= 480 \text{ km}$$

(iii) Distance travelled in 15 sec = $\frac{15}{3600} = \frac{1}{240} \text{ h}$

$$= \frac{1}{240} \times 720$$

$$= 3 \text{ km}$$

Question 5.

A dog is walking at a speed of 6 km/h.

(i) How much distance does it cover in 5 minutes?

(ii) How much time would it take to cover 200 metres?

Solution:

Speed of a dog = 6 km/h

$$(i) \text{ Distance travelled in 5 min.} = \frac{5}{60} \times 6 \text{ km} \\ = \frac{1}{2} \text{ km}$$

$$= 500 \text{ m}$$

(ii) Time taken to cover 200 m

$$= \frac{200}{1000} \text{ km} \times \frac{1}{6} \text{ h}$$

$$= \frac{1}{30} \text{ h}$$

$$= \frac{1}{30} \times 60$$

$$= 2 \text{ minutes}$$

Question 6.

A swimming pool is 50 metres long. A boy can swim across the length and then return to his starting position in 5 minutes. What is his swimming speed in km/h?

Solution:

Length of a swimming pool = 50 m

A boy crosses it and then come back

Total distance covered = $50 \times 2 = 100 \text{ m}$

Time taken = 5 minutes

$$\therefore \text{ Speed in km/h} = \frac{D}{T} = \frac{100 \times 60}{1000 \times 5}$$

$$= 1 \frac{1}{5} \text{ km/h} = 1.2 \text{ km/h}$$

Question 7.

A bus takes 48 minutes to cover a certain distance when travelling at a speed of 50 km/h. How much time will it take to cover the same distance when travelling at a speed of 30 km/h?

Solution:

Speed of a bus = 50 km/h

Time taken = 48 minutes

Distance = Speed \times Time

$$= 50 \times \frac{48}{60} \text{ km} = 40 \text{ km}$$

In second time speed = 30 km/h

Time taken = $\frac{D}{S}$

$$= \frac{40}{30}$$

$$= \frac{4}{3} \text{ h}$$

$$= 1 \text{ hours } \frac{1}{3} \text{ min.}$$

$$= 1 \text{ hours } \frac{1}{3} \times 60 \text{ min.}$$

$$= 1 \text{ hour } 20 \text{ minutes}$$