

RACES AND GAMES

1. **Races:** A contest of speed in running, riding, driving, sailing or rowing is called a race.
2. **Race Course:** The ground or path on which contests are made is called a race course.
3. **Starting Point:** The point from which a race begins is known as a starting point.
4. **Winning Point or Goal:** The point set to bound a race is called a winning point or a goal.
5. **Winner:** The person who first reaches the winning point is called a winner.
6. **Dead Heat Race:** If all the persons contesting a race reach the goal exactly at the same time, the race is said to be dead heat race.
7. **Start:** Suppose A and B are two contestants in a race. If before the start of the race, A is at the starting point and B is ahead of A by 12 metres, then we say that 'A gives B, a start of 12 metres'.

To cover a race of 100 metres in this case, A will have to cover 100 metres while B will have to cover only $(100 - 12) = 88$ metres.

In a 100 race, 'A can give B 12 m' or 'A can give B a start of 12 m' or 'A beats B by 12 m' means that while A runs 100 m, B runs $(100 - 12) = 88$ m.

8. **Games:** 'A game of 100, means that the person among the contestants who scores 100 points first is the winner'.
If A scores 100 points while B scores only 80 points, then we say that 'A can give B 20 points'.

Problems with solutions

1. A and B take part in 100 m race. A runs at 5 kmph. A gives B a start of 8 m and still beats him by 8 seconds. The speed of B is:

Solution

$$\text{A's speed} = \left(5 \times \frac{5}{18}\right) \text{m/sec} = \frac{25}{18} \text{ m/sec.}$$

$$\text{Time taken by A to cover 100 m} = \left(100 \times \frac{18}{25}\right) \text{sec} = 72 \text{ sec.}$$

$$\therefore \text{Time taken by B to cover 92 m} = (72 + 8) = 80 \text{ sec.}$$

$$\therefore \text{B's speed} = \left(\frac{92}{80} \times \frac{18}{5}\right) \text{kmph} = 4.14 \text{ kmph.}$$

2. In a 100 m race, A beats B by 10 m and C by 13 m. In a race of 180 m, B will beat C by:

Solution

$$\text{A: B} = 100 : 90.$$

$$\text{A: C} = 100 : 87.$$

$$\underline{\text{B}} = \underline{\text{B}} \times \underline{\text{A}} = \underline{90} \times \underline{100} = \underline{30}.$$

C A C 100 87 29

When B runs 30 m, C runs 29 m.

When B runs 180 m, C runs $\left(\frac{29}{30} \times 180\right)_m = 174$ m.

∴ B beats C by $(180 - 174)$ m = 6 m.

3. In 100 m race, A covers the distance in 36 seconds and B in 45 seconds. In this race A beats B by:

Solution

Distance covered by B in 9 sec. = $\left(\frac{100}{45} \times 9\right)_m = 20$ m.

A beats B by 20 metres.

4. In a 200 metres race A beats B by 35 m or 7 seconds. A's time over the course is:

Solution

B runs 35 m in 7 sec.

B covers 200 m in $\left(\frac{7}{35} \times 200\right) = 40$ sec.

B's time over the course = 40 sec.

A's time over the course $(40 - 7)$ sec = 33 sec.

5. In a 300 m race A beats B by 22.5 m or 6 seconds. B's time over the course is:

Solution

B runs $\frac{45}{2}$ m in 6 sec.

B covers 300 m in $\left(6 \times \frac{2}{45} \times 300\right)_{\text{sec}} = 80$ sec.