SNS COLLEGE OF TECHNOLOGY

An Autonomous Institution

Coimbatore-35

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19GET276 – VQAR II

II YEAR/ IV SEMESTER

UNIT 1 – QUANTITATIVE ABILITY III

TOPIC – RACES

RACES

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.

RACES

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'.

RACES

In a 100 m race, A can give B 10 m and C 28 m. In the same race B can give C:

A. 18 m

B. 20 m

C. 27 m

D. 9 m

Answer: Option **B**

Explanation:

A : B = 100 : 90.

A : C = 100 : 72.

$$B : C = \frac{B}{A} \times \frac{A}{C} = \frac{90}{100} \times \frac{100}{72} = \frac{90}{72}.$$

When B runs 90 m, C runs 72 m.

When B runs 100 m, C runs $\left(\frac{72}{90} \times 100\right)$ m = 80 m.

∴ B can give C 20 m.

RACES

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:

A. 5.15 kmph

B. 4.14 kmph

C. 4.25 kmph

D. 4.4 kmph

Answer: Option **B**

Explanation:

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

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

∴ Time taken by B to cover 92 m = (72 + 8) = 80 sec.

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

RACES

In a 500 m race, the ratio of the speeds of two contestants A and B is 3 : 4. A has a start of 140 m. Then, A wins by:

A. 60 m

B. 40 m

C. 20 m

D. 10 m

Answer: Option **C**

Explanation:

To reach the winning post A will have to cover a distance of (500 - 140)m, *i.e.*, 360 m.

While A covers 3 m, B covers 4 m.

While A covers 360 m, B covers $\left(\frac{4}{3} \times 360\right)$m = 480 m.

Thus, when A reaches the winning post, B covers 480 m and therefore remains 20 m behind.

∴ A wins by 20 m.

RACES

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:

A. 5.4 m

B. 4.5 m

C. 5 m

D. 6 m

Answer: Option **D**

Explanation:

A : B = 100 : 90.

A : C = 100 : 87.

$$\frac{B}{C} = \frac{B}{A} \times \frac{A}{C} = \frac{90}{100} \times \frac{100}{87} = \frac{30}{29}.$$

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.

RACES

At a game of billiards, A can give B 15 points in 60 and A can give C to 20 points in 60. How many points can B give C in a game of 90?

A. 30 points

B. 20 points

C. 10 points

D. 12 points

Answer: Option **C**

Explanation:

A : B = 60 : 45.

A : C = 60 : 40.

$$\therefore \frac{B}{C} = \left(\frac{B}{A} \times \frac{A}{C}\right) = \left(\frac{45}{60} \times \frac{60}{40}\right) = \frac{45}{40} = \frac{90}{80} = 90 : 80.$$

∴ B can give C 10 points in a game of 90.

RACES

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

A. 20 m

B. 25 m

C. 22.5 m

D. 9 m

Answer: Option **A**

Explanation:

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

∴ A beats B by 20 metres.

RACES

In a game of 100 points, A can give B 20 points and C 28 points. Then, B can give C:

A. 8 points

B. 10 points

C. 14 points

D. 40 points

Answer: Option **B**

Explanation:

A : B = 100 : 80.

A : C = 100 : 72.

$$\therefore \quad \frac{B}{C} = \left(\frac{B}{A} \times \frac{A}{C}\right) = \left(\frac{80}{100} \times \frac{100}{72}\right) = \frac{10}{9} = \frac{100}{90} = 100 : 90.$$

∴ B can give C 10 points.

RACES

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

A. 40 sec

B. 47 sec

C. 33 sec

D. None of these

Answer: Option **C**

Explanation:

B runs 35 m in 7 sec.

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

B's time over the course = 40 sec.

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

RACES

In a 100 m race, A can beat B by 25 m and B can beat C by 4 m. In the same race, A can beat C by:

A. 21 m

B. 26 m

C. 28 m

D. 29 m

Answer: Option **C**

Explanation:

A : B = 100 : 75

B : C = 100 : 96.

$$\therefore \text{ A : C} = \left(\frac{A}{B} \times \frac{B}{C}\right) = \left(\frac{100}{75} \times \frac{100}{96}\right) = \frac{100}{72} = 100 : 72.$$

∴ A beats C by (100 - 72) m = 28 m.

RACES

In a race of 200 m, A can beat B by 31 m and C by 18 m. In a race of 350 m, C will beat B by:

A. 22.75 m

B. 25 m

C. 19.5 m

D. $7\frac{4}{7}$ m

Answer: Option **B**

Explanation:

A : B = 200 : 169.

A : C = 200 : 182.

$$\frac{C}{B} = \left(\frac{C}{A} \times \frac{A}{B}\right) = \left(\frac{182}{200} \times \frac{200}{169}\right) = 182 : 169.$$

When C covers 182 m, B covers 169 m.

When C covers 350 m, B covers $\left(\frac{169}{182} \times 350\right)$ m = 325 m.

Therefore, C beats B by (350 - 325) m = 25 m.

RACES

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

A. 86 sec

B. 80 sec

C. 76 sec

D. None of these

Answer: Option **B**

Explanation:

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

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

THANK YOU