Race: A race is a contest of speed in running, riding, driving, sailing, rowing etc. over a praticular distance.

Race course: Race course is the ground or Path on which contests are conducted.

starting point: Starting point is the point from which a race starts.

winning point (or) goal: winning point is the where race finishes or end.

Dead- heat race: A race is said to be a dead heat race if all the persons contesting the race (each other) the winning point exactly at the same time.

winner: winner is the person who reaches the goal first.

* A game of 100 points means that the person who scroes 100 points first, is the winner.

general statements involed in races and games and their mathematical interpretations.

let A and B be two participants in a race. let examine some of general statements and their mathematical representation.

1) A beats B by 't' seconds means that

A finshes the races 't' seconds before B finishes. (if T·A = x sec)

2) A gives B a start of 't' seconds meuns that A starts the race 't' seconds after B from the same starting point

$$(\text{if } T \cdot B = x + y \text{ sec}). \quad T_B \; y \; \text{sec.}$$

$$T_A = y - t \; \text{sec.}$$

3) A gives a starts of B of 'x' meters means that while A strat from starting point, B starts 'y' means met ahead from the starting point at the same time $= (y - x)$ met.

4) A beats B by x meters means that when A reaches the goal B is x meters behind the goal. i.e., in a race of y meters A travels y meters in the same time B travels only $(y - x)$ meters

5) In a game of 100, A can give B 'x' Points means that while A scroes 100 points, B scores only $100 - x$ Points to win the game.

6) In a game of 100 points, A beats B by 'x' points means that when A scores 100 Points in the same time B scores only $100 - x$ points

7) If A is n times as fast B and A gives B a start of x meters, to B then the length of the race course, so that A and B will reaches the winning point (Dead Head) the same time $x\left(\dfrac{n}{n-1}\right)$ meters.

1) A runs $1\frac{2}{3}$ time as fast B. If A gives B a start of 80m, how far must the winning post must be so that A and B might reach it at the same time?

A)

$$n = \frac{5}{3} \qquad x = 80$$

$$80\left(\frac{\frac{5}{3}}{\frac{5}{3}-1}\right) \Rightarrow 80\left(\frac{\frac{5}{3}}{\frac{5-3}{3}}\right)$$

$$\overset{40}{\cancel{80}}\left(\frac{5}{\cancel{3}} \times \frac{\cancel{3}}{\cancel{2}}\right) \Rightarrow 200m$$

2) $\frac{7}{3}$ times.

$\times \left(\frac{n}{n-1} \right)$

$80 \left(\dfrac{\frac{7}{3}}{\frac{7}{3}-1} \right) \Rightarrow 80 \left(\dfrac{\frac{7}{3}}{\frac{7-3}{3}} \right) \Rightarrow 80 \left(\frac{7}{4} \times 3 \right)$

$\Rightarrow .140 \ mt.$

3) A runs $1\frac{3}{8}$ times as fast as B
If A give B a start of 90 m and
they reach the goal at the same time
The goal is at a distance of.

B) $\qquad n = \frac{11}{8} \qquad x = 90$

$\frac{11}{8} \left(\qquad \right) \quad 90 \left(\dfrac{\frac{11}{8}}{\frac{11}{8}-1} \right) \Rightarrow 90 \left(\frac{11}{8} \times \frac{8}{3} \right)$

$= 330 \ m.$

4) A can run 224 mt in 28 sec. B
in 32 sec. By what distance A beat
B ?

$\frac{x}{t_2}(t_2 - t_1)$

A) $x = 224$ $t_2 = 32.$

$t_1 = 28$

$\dfrac{224}{28}(32-28)$

$28, m.$

$\dfrac{224}{28}(4)$

$= 28 m$

5) In a 100 m race a can give B 10 m and C 28m. In the same race B can give C.

A) A1 = 100 m   B1 = 90 m   C1 = 72m.

$x \dfrac{8}{5}$) In the same race B can give x meters to C. Then B2 is 100m.

$$C_2 = (100 - x) \, m.$$

$$\frac{C_1}{B_1} = \frac{C_2}{B_2}$$

$$\frac{\overset{24}{\cancel{72}}}{\underset{3}{\cancel{90}}} \times = \frac{100 - x}{100}$$

$$240 = (100 - x) \, 3$$

$$240 = 300 - 3x$$

$$3x = 300 - 240$$

$$3x = 60$$

$$x = \underline{20}.$$

$$\begin{array}{r} \overset{10}{\cancel{300}} \\ \underline{240} \\ 60 \end{array}$$