

## Answer on Question # 68805 – Physics – Mechanics- Relativity:

Question: A baseball player wants to hit a ball “out of the park.” The player hits the ball at 48.2 m/s at an angle of  $29.0^\circ$  above the horizontal. The outfield bleachers are 145 m away from home plate. What is the maximum height, above the where the player hits the ball, that the bleachers can be and have the ball still go over them?

Solution: Initial horizontal velocity:  $V_{xi} = (48.2) \cdot \cos(29)^\circ = 42.16$  m/sec.

Initial vertical velocity :  $V_{yi} = (48.2) \cdot \sin(29)^\circ = 23.37$  m/ sec.

Time of flight :  $T_f = \frac{145}{42.16} = 3.44$  sec.

$$\begin{aligned} \text{Maximum height } H_f &= \frac{1}{2} \cdot g \cdot T_f^2 + V_{yi} \cdot T_f = \left(\frac{1}{2}\right) \cdot (-9.8) \cdot (3.44)^2 + (23.37) \cdot (3.44) = - 57.98 + 80.39 \\ &= 22.41 \text{ meter.} \end{aligned}$$

(-) ve sign indicates g in upward direction.

Answer: So, maximum height will be 22.41 m.

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