

A baseball is hit so that it travels straight upward after being struck by the bat. A fan observes that it takes 3.20 s for the ball to reach its maximum height.

- (a) Find its initial velocity.
- (b) Find the height it reaches.

When the ball is reached its maximum height, the velocity is equal to 0. So, assuming that the ball's final velocity is 0:

$$g = \frac{v_0}{t} \rightarrow v_0 = gt$$
$$v_0 = 9.8m/s^2 * 3.2s = 31.36m/s$$

Maximum height, which ball can reach:

$$H = \frac{gt^2}{2} = \frac{9.8m/s^2 * (3.2s)^2}{2} = 50.18m$$

Answer: $v_0 = 31.36m/s$, $H = 50.18m$