

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