

Answer on Question #63922-Physics-Other

A stone M is thrown vertically upward with velocity of 20 m/s at the same time and 30m vertical above a second stone N is left fall. After what time and what height do they collide take $g=10\text{m/s}^2$

Solution

The displacement of stone M is

$$y_M = v_M t - \frac{gt^2}{2}.$$

The displacement of stone N is

$$y_N = h - \frac{gt^2}{2}.$$

At the collision:

$$y_M = y_N$$

$$v_M t - \frac{gt^2}{2} = h - \frac{gt^2}{2}$$

The time is

$$t = \frac{h}{v_M} = \frac{30}{20} = 1.5 \text{ s}.$$

The height is

$$H = 30 - \frac{10(1.5)^2}{2} = 18.75 \text{ m}.$$

<https://www.AssignmentExpert.com>