

Question #77213, Physics / Other

A ball is thrown horizontally from the top of a cliff 20m high. if the initial horizontal velocity is 8.0 m/s find the speed which its strike the ground.

b. How long it takes to reach the horizontal plane at the foot of the cliff

c. How far from the foot of the cliff it strikes the ground

**Solution**

a. Assuming negligible air drag, the horizontal velocity remains constant.

The final vertical velocity is calculated as follows.

$$v_y = \sqrt{2gh} = \sqrt{2 \times 9.8 \times 20} = 19.8 \text{ m/s}$$

The final speed is calculated as follows.

$$v = \sqrt{v_x^2 + v_y^2} = \sqrt{8^2 + 19.8^2} = 21.4 \text{ m/s}$$

$$\text{b. } t = \frac{v_y}{g} = \frac{19.8}{9.8} = 2.0 \text{ s}$$

$$\text{c. } \Delta x = v_x t = 8 \times 2.0 = 16 \text{ m}$$

Answer provided by <https://www.AssignmentExpert.com>