Answer on Question #65097-Physics-Other

A stone is thrown vertically upward with a speed of 26.0 m/s. How fast is it moving when it is at a height of 13.0 m? How much time is required to reach this height?

Solution

We use kinematic equation:

$$v_f^2 - v_i^2 = 2as.$$

In our case:

$$v_i^2 - v_f^2 = 2gh$$

The velocity will be

$$v_f = \sqrt{v_i^2 - 2gh} = \sqrt{(26)^2 - 2(9.81)(13)} = 20.5\frac{m}{s}.$$

The deceleration is

$$g = \frac{v_i - v_f}{t}$$

The time is

$$t = \frac{v_i - v_f}{g} = \frac{26.0 - 20.5}{9.81} = 0.56\ s.$$