# Answer on Question #47943, Physics, Mechanics | Kinematics | Dynamics

An apple falls from a tree and hits the ground 9.41 m below. With what speed will it hit the ground? The acceleration of gravity is 9.8 m/s². Answer in units of m/s

### Solution:

The kinematic equation that describes an object's motion is:

$$v_f^2 = v_i^2 + 2ad$$

The symbol $d$ stands for the displacement of the object. The symbol $a$ stands for the acceleration of the object. And the symbol v stands for the velocity of the object; a subscript of i after the v indicates that the velocity value is the initial velocity value and a subscript of f indicates that the velocity value is the final velocity value.

$$v_i = 0$$
$$d = 9.41 \text{ m}$$
$$a = g = 9.8 \text{ m/s}^2$$

$$v_f = \sqrt{0 + 2 * 9.8 * 9.41} = 13.58 \text{ m/s}$$

**Answer:** $v_f = 13.58 \text{ m/s}$