Answer on Question #69588, Physics / Other

While visiting the Sky Tower you happen to drop some coins from the top floor which is 222 m above the ground below. Assuming that the coins do not reach terminal velocity and accelerate at 9.81 m/s^2 , what is the speed just before they reach the ground? Write you answer in m/s^2.

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.

In our case

$$v_i = 0\ m/s$$
$$d = 222\ m$$
$$a = 9.81\ m/s^2$$

$$v_f = \sqrt{2ad} = \sqrt{2 \times 9.81 \times 222} = 66.0\ m/s$$

Answer: $66.0\ m/s$