Answer on Question #69900-Physics-Other

A penny is dropped from rest from the top of the Willis Tower in Chicago. Considering that the height of the building is 1400 ft and ignoring air resistance, find the speed of the penny just before the penny strikes the ground.

Solution

From the conservation of energy:

$$\frac{mv^2}{2} = mgh$$

$$v = \sqrt{2gh}$$

The speed of the penny just before the penny strikes the ground is

$$v = \sqrt{2\left(9.8\frac{m}{s^2}\right)\left(1400\ ft \cdot 0.3048\frac{m}{ft}\right)} = 91.5\frac{m}{s}.$$

Answer: $91.5\frac{m}{s}$.