

## Answer on Question #51990 – Physics – Other

### Question.

A bullet is straight upward with a velocity of 100 m/s from the top of a building 100 m high. Find its maximum height above the ground.

Given:

$$v_0 = 100 \frac{m}{s}$$

$$h_0 = 100 \text{ m}$$

Find:

$$h_{max} = ?$$

### Solution.

From the energy conservation

$$\frac{mv_0^2}{2} = mgh_{max}$$

it is known that maximum height can be defined as:

$$h_{max} = \frac{v_0^2}{2g}$$

But in our case maximum height above the ground is the sum of height of a building and maximum height above the top of building. So,

$$h_{max} = h_0 + \frac{v_0^2}{2g}$$

Calculate:

$$h_{max} = h_0 + \frac{v_0^2}{2g} = 100 + \frac{10000}{2 \cdot 9.8} = 100 + 510 = 610 \text{ m}$$

### Answer.

$$h_{max} = h_0 + \frac{v_0^2}{2g} = 610 \text{ m}$$