Answer on Question #65044-Physics-Other

A rocket of mass 150kg is fired vertically into the air with a velocity of 15 meters per second. If at its greatest height is stationary how high will it go?

Solution

The velocity of the free falling body is

$$v = v_0 - gt.$$

At the maximal height:

$$0 = v_0 - gt \to t = \frac{v_0}{g}.$$

The greatest height is

$$H = \frac{gt^2}{2} = \frac{g}{2}\left(\frac{v_0}{g}\right)^2 = \frac{v_0^2}{2g} = \frac{(15)^2}{2(9.8)} = 1100\ m = 1.1\ km.$$

Answer: $\mathbf{1.1}\ \boldsymbol{km}$.