Answer on Question #49602-Physics-Mechanics-Kinematics-Dynamics

Horizontal Component is $v_{x0} = 7.5\frac{m}{s}$.

Vertical Component $v_{y0} = 13.0\frac{m}{s}$.

Assuming that air resistance is neglected find out the maximum height which the ball rises.

Solution

If we assume that air resistance is neglected we can use the projectile motion approach.

The maximum height which the ball rises is given by the formula

$$H_{max} = \frac{v_0^2 \sin^2 \alpha}{2g},$$

where α is an angle of projection, g is an acceleration of gravity.

But

$$v_{y0} = v_0 \sin \alpha.$$

Thus,

$$H_{max} = \frac{v_{y0}^2}{2g} = \frac{\left(13.0\frac{m}{s}\right)^2}{2 \cdot 9.8\frac{m}{s^2}} = 8.6\, m.$$

Answer: $8.6\ m$.