Question#20775

a cannon is fired horizontally from the top of a castle and lands 250 meters down range. if the cannon ball leaves the cannon at 400 m/s how high is the castle?

Solution:

Let:

$S = 250\ m$

$v = 400\ m/s$

$H - ?$

$S = vt$,

Were t is the time of free falling from height H

$t = \frac{S}{v}$

Such as:

$H = \frac{1}{2} g t^2$

=>

$$\boldsymbol{H = \frac{gS^2}{2v^2}}$$

$$\boldsymbol{H = \frac{9.8 * 250^2}{2 * 400^2} = 1.91\ m}$$

Answer: 1.91 m.