Cannonball

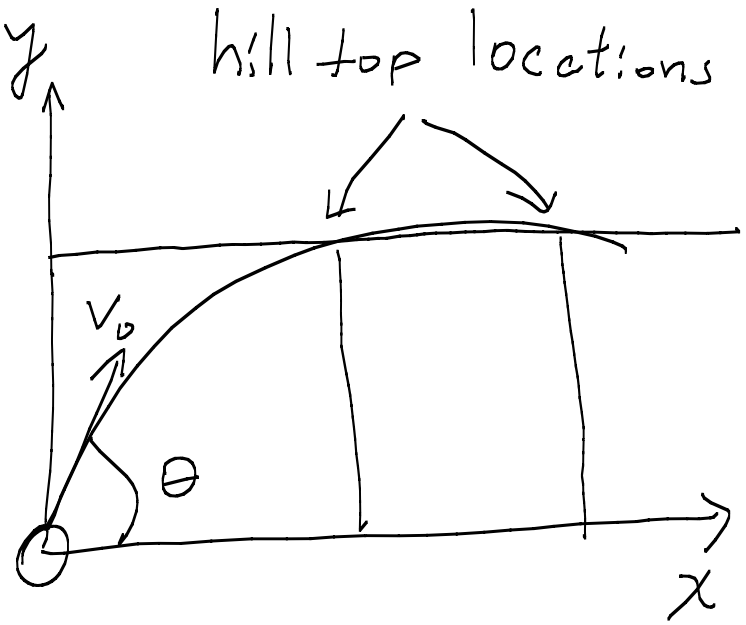
Note Title 9/21/2007

a. $x_0 = 0$ $\quad y_0 = 0$

$v_{0x} = 40 \frac{m}{s}$ $\quad v_{0y} = 30 \frac{m}{s}$

$a_x = 0$ $\quad a_y = -9.8 \frac{m}{s^2}$

$y = 40\ m$



b. $v_y^2 = v_{oy}^2 + 2a_y(y - y_0)$

$v_y = \pm\sqrt{v_{oy}^2 + 2a_y(y - y_0)}$

$= \pm\sqrt{v_{oy}^2 + 2a_y y}$

$= \pm\sqrt{(30\frac{m}{s})^2 + 2(-9.8\frac{m}{s^2})(40m)}$

$= \pm 10.7\ \frac{m}{s}$

c. $v_y = v_{0y} + a_y t$

$$t = \frac{v_y - v_{0y}}{a_y}$$

$$= \frac{(10.7 - 30)\frac{m}{s}}{-9.8\frac{m}{s^2}} \text{ or } \frac{(-10.7 - 30)\frac{m}{s}}{-9.8\frac{m}{s^2}}$$

$$= 1.97\,s \text{ or } 4.15\,s$$

d. $$a = \frac{v_f - v_i}{\Delta t}$$

$$= \frac{(-10.7 - 10.7)\ \frac{m}{s}}{(4.15 - 1.97)\ s}$$

$$= -9.82\ \frac{m}{s^2}$$