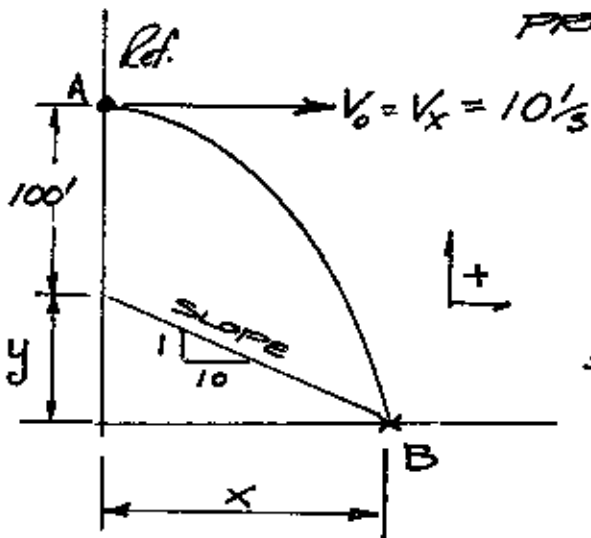


PROJECTILE



Stones are thrown from pt. A with initial velocity.

FIND: V_B

pt. B $(x, -(100+y))$

SLOPE = $\frac{y}{x} = \frac{1}{10} \therefore X = 10y$

or $y = \frac{x}{10}$

HORIZONTAL

VERTICAL

$x = x_0 + V_{0x}t + \frac{1}{2}a_x t^2$

$y = y_0 + V_{0y}t + \frac{1}{2}a_y t^2$

$x = 10t$

$-(100+y) = -\frac{32.2 \frac{1}{2} t^2}{2}$

or $10y = 10t$
 $y = t$

substitute

$-100 - t = -16.1 t^2$

$16.1 t^2 - t - 100 = 0$

$t = \frac{-(-1) \pm \sqrt{1 - 4(16.1)(-100)}}{2(16.1)} = \frac{1 \pm 80.26}{32.2}$

$t = 2.523 \text{ s}$

Alcino

$V_x = V_{0x} + a_x t$

$V_y = V_{0y} + a_y t$

$V_{Bx} = 10 \frac{\text{ft}}{\text{s}} \rightarrow$

$V_{By} = -32.2 \frac{1}{\text{s}^2} (2.523) = -81.242 \frac{\text{ft}}{\text{s}} \downarrow$

$\vec{V}_B = V_{Bx} \hat{i} + V_{By} \hat{j} = 10 \hat{i} - 81.242 \hat{j}$

$|V_B| = \sqrt{10^2 + 81.242^2} = 81.86 \frac{\text{ft}}{\text{s}} = V_B$

LOCATION of pt. B $(x, -(100+y))$

where $x = 10t = 25.23 \text{ ft.}$ TO THE RIGHT \rightarrow

$y = -(100+y) = -100 - \frac{25.23}{10} = 102.52 \text{ ft} \downarrow$ DOWN