PITCH ANGLE

Related Equations.

$\Delta z = v_{i_z} t - \frac{1}{2} g t^2 \qquad t = \frac{\Delta d}{v_i \cos\theta}$

Δd = distance traveled towards target.

Δz = Displacement in z axis

$\Delta z = \frac{v_i \sin\theta \, \Delta d}{v_i \cos\theta} - \frac{1}{2} \frac{9.9 \, \Delta d^2}{v_i^2 \cos^2\theta}$

$\Delta z = z - z_0$

$\Delta z = \Delta d \tan\theta - \frac{4.9 \, \Delta d^2 \sec^2\theta}{v_i^2}$

$\sec^2\theta = 1 + \tan^2\theta$

$\Delta z = \Delta d \tan\theta - \frac{4.9 \, \Delta d^2 (\tan^2\theta + 1)}{v_i^2}$

$\Delta z = \Delta d \tan\theta - \frac{4.9 \Delta d^2}{v_i^2} - \frac{4.9 \Delta d^2 \tan^2\theta}{v_i^2}$

$\tan\theta = x$

$-\frac{4.9 \Delta d^2 x^2}{v_i^2} + \Delta d x - \Delta z + \frac{4.9 \Delta d^2}{v_i^2} = 0$

$a = -\frac{4.9 \Delta d^2}{v_i^2} \qquad b = \Delta d \qquad c = -\Delta z - \frac{4.9 \Delta d^2}{v_i^2}$