

Derivation of Symmetrical Projectile Motion Equations

1. TIME TO VERTEX: Starting with $v_{yf} = v_{yo} + a_y t$ and the fact that $v_{yo} = y - \text{component}$, and $v_{yf} = 0$ solve for t .

2. DISTANCE TO VERTEX: Starting with $v_{yf}^2 = v_{yo}^2 + 2a_y d_y$ and the fact that $v_{yo} = y - \text{component}$ and $v_{yf} = 0$ solve for d

3. RANGE EQUATION: Starting with $d_x = v_{xo} * t + \frac{1}{2} a_x t^2$ and the fact $v_{xo} = x - \text{component}$, and $t =$ the time from problem 1. Solve for d_x .