Physics 101
Quiz # 1
Chapter 2

Name : Solution Id : Sec. # : **25**

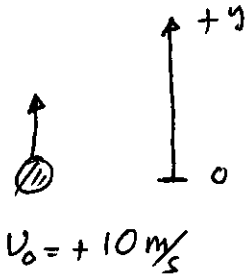
A ball is thrown vertically upward with an initial speed of 10 m/s. How long does the ball take to reach a point 5.0 m above the release point? (Take the acceleration due to gravity to be 10.0 m/s^2)

$y_2 = 5.0$ m, $y_1 = 0$

$\Rightarrow \Delta y = 5.0$ m

$v_0 = +10$ m/s

t ?



Use $\Delta y = v_0 t - \frac{1}{2} g t^2$

$5 = 10t - \frac{1}{2} \times 10 t^2$

$5 = 10t - 5t^2$

Divide by 5 and rearrange the equation

$t^2 - 2t + 1 = 0$

$(t-1)^2 = 0$

$\Rightarrow \boxed{t = 1.0 \text{ s}}$

For quadratic equation, one would expect two solutions. In this case $y = 5.0$ m is maximum height, that is both solutions gives $t = 1$.