**Phys101 – Sec # 40** **Quiz # 1 (Chapter 2)**

**Name:** Key **ID #** _____

1) A ball is released from rest at the top of a building. The time it takes the ball to fall from the top of the building to halfway to the ground is 1 s. Find the total time it takes for the ball to fall from the top of the building to the ground.

$v_0 = 0$

$t = 1\ s$

$\Delta y = -H/2$

$a_y = -g$

$-\frac{H}{2} = \cancel{v_0 t}^{0} - \frac{1}{2} g t^2$

$+\frac{H}{2} = +4.9$

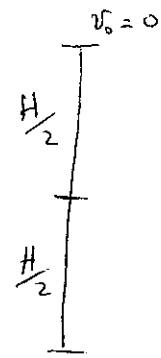
$H = 9.8\ m$

$-H = \cancel{v_0 t}^{0} - \frac{1}{2} g t^2$

$+9.8 = +4.9\ t^2$

$t = \sqrt{\frac{9.8}{4.9}} = \sqrt{2}$

$t = 1.4\ s$




2) An object starts from rest at the origin and moves along the x axis with a constant acceleration of 4 m/s$^2$. Find its average velocity as it goes from x=0 to x=15 m.

$\Delta x = 15\ m$

$a = 4\ m/s^2$

$v_0 = 0$

$t = ?$

$\Delta x = \cancel{v_0 t}^{0} + \frac{1}{2} a t^2$

$15 = \frac{1}{2}(4) t^2$

$t = \sqrt{\frac{15}{2}} = 2.74\ s$

$\bar{v} = \frac{\Delta x}{\Delta t} = \frac{15}{2.74} = 5.5\ m/s$

another method

because of constant acceleration

$\bar{v} = \frac{\cancel{v_0}^{0} + v_f}{2} = \frac{v_0 + at}{2} = \frac{1}{2}(4)(2.74)$

$= 2(2.74)$

$= 5.5\ m/s$