Phys 101 – Sec # 38 **Quiz # 1 (Ch. 1 + 2)**

Name: (Key) **ID #**

1- A stone is thrown vertically upward with an initial speed of 15 m/s. What is its speed at a height of 10 m from its release point?

$v_0 = +15 \frac{m}{s}$

$\Delta y = +10\ m$

(4)

$a = -g$

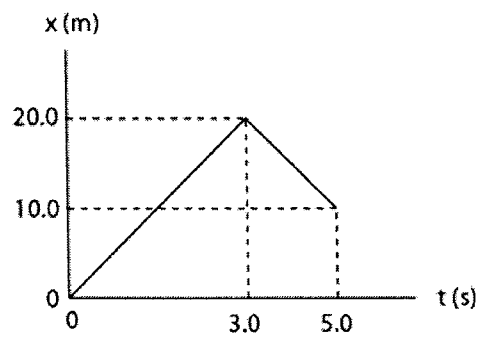
$v = ?$ use $v^2 - v_0^2 = 2a\Delta y$

$v^2 = v_0^2 - 2g\Delta y = (15)^2 - 2(9.8)(10) = 29$

$v = \pm\sqrt{29} \simeq \pm 5.4 \frac{m}{s}$ Speed $\simeq 5.4 \frac{m}{s}$

2- The figure shows the position-time graph of an object. What is the average velocity of the object between t=0 s and t= 5 s?

$v_{avg} = \frac{\Delta x}{\Delta t} = \frac{10-0}{5-0} = 2 \frac{m}{s}$



(3)

3- Suppose $A = \frac{B^n}{C^m}$, where A has dimensions LT, B has dimensions L^2T^{-1}, and C has dimensions LT^2. Find the values of exponents n and m.

$LT = \frac{(L^2T^{-1})^n}{(LT^2)^m} = \frac{L^{2n}T^{-n}}{L^m T^{2m}}$ both sides should have the same dimensions.

(3)

$L = \frac{L^{2n}}{L^m} = L^{2n-m}$

$\Rightarrow \boxed{1 = 2n - m}$ (1)

$T = \frac{T^{-n}}{T^{2m}} = T^{-n-2m}$

$\Rightarrow \boxed{1 = -n - 2m}$ (2) multiply it by 2

$\Rightarrow \boxed{2 = -2n - 4m}$ (2')

add (1) and (2')

$3 = -5m$

$\boxed{m = \frac{-3}{5}}$ (3)

substitute (3) in (1) to get

$1 = 2n + \frac{3}{5}$

$(n) = \frac{1}{2}(1 - \frac{3}{5}) = \boxed{\frac{1}{5}}$