Chapter 2- Reminder

Part 1:

1- Distance (scalar): $|x_2-x_1|$ (Positive)

2- Displacement (vector): $\Delta x=x_2-x_2$ (Positive or negative)

3- Average velocity (vector): $v_{avg}=\frac{\Delta x}{\Delta t}=\frac{x_2-x_1}{t_2-t_1}$

4- Average speed (scalar): $s_{avg}=\frac{\text{total distance}}{\text{total time}}=\frac{x_2+x_1}{t_2+t_2}$

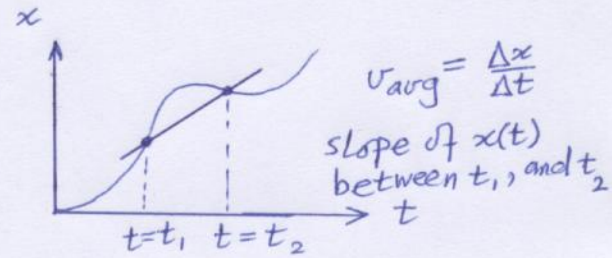
5- Instantaneous velocity (vector): $v=\lim_{\Delta t\to 0}\frac{\Delta x}{\Delta t}=\frac{dx}{dt}$

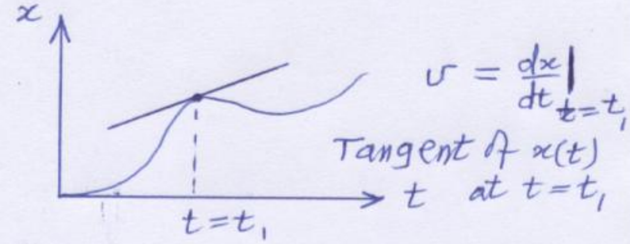
6- Instantaneous speed (scalar): $s=|v|$

7- Uniform velocity (vector): $v=\frac{\Delta x}{\Delta t}$

8- Average acceleration (vector): $a_{avg}=\frac{\Delta v}{\Delta t}=\frac{v_2-v_1}{t_2-t_1}$

9-Instantaneous acceleration (vector): $a=\lim_{\Delta t\to 0}\frac{\Delta v}{\Delta t}=\frac{dv}{dt}$





Part 2: Horizontal Motion with constant acceleration (uniform acceleration)

1- $v=v_o+at$

2- $\Delta x=x-x_o=v_ot+\frac{1}{2}at^2$, if we assume that x_o is = zero, therefore:

$x=v_ot+\frac{1}{2}at^2$

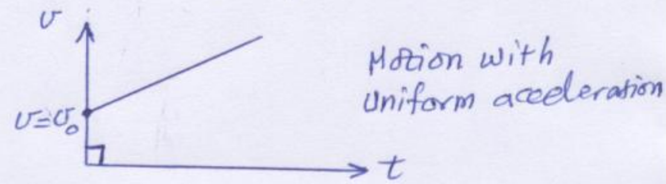
3- $v^2=v_0^2+2a\Delta x$, putting x_o is = zero, therefore:

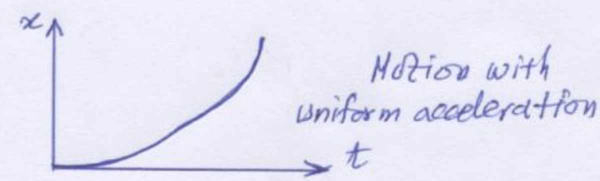
$v^2=v_0^2+2ax$

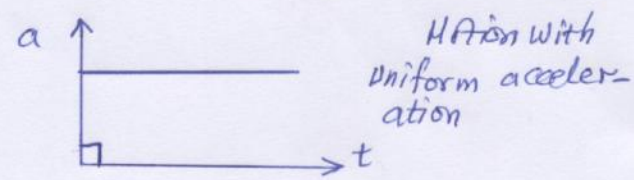
4- $\Delta x=\left(\frac{v+v_o}{2}\right)t$ after putting x_o = zero, therefore it will become:

$x=\left(\frac{v+v_o}{2}\right)t$

- We call a as acceleration, when **a** is positive.
- We cal a as deceleration, when **a** is negative.



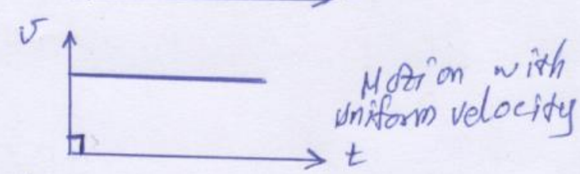




Part3: Motion with constant velocity (uniform velocity)

$v=\frac{\Delta x}{\Delta t}$, put x_o =zero which is mean:

$v=\frac{x}{t}$



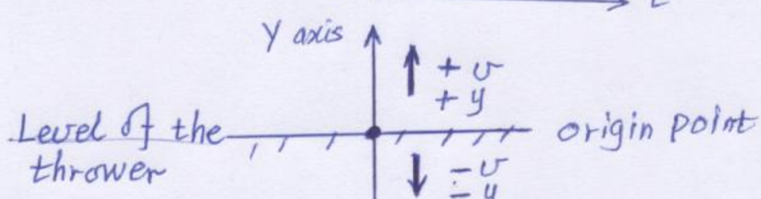
Part4: Free fall object (vertical motion)

1- $v=v_o+at$

2- $y=v_ot+\frac{1}{2}at^2$

3- $v^2=v_0^2+2ay$

4- $y=\left(\frac{v+v_o}{2}\right)t$



Reference direction:

1- $a=-9.8\ m/s^2$ always (ether upward or downward motion).

2- The velocity, and the position above the origin point (level of the thrower) are positive.