

## ONE-DIMENSIONAL MOTION

[Online Classes : Megalecture@gmail.com](mailto:Megalecture@gmail.com)

[www.youtube.com/megalecture](http://www.youtube.com/megalecture)

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$$x_t = x_0 + v_{0x}t + \frac{1}{2}a_x t^2$$

$$v_{x_t} = v_{0x} + a_x t \rightarrow \dot{x}$$

$$a_{x_t} = a_x \rightarrow \ddot{x}/\dot{v}$$

## TWO-DIMENSIONAL MOTION (parabolic trajectory)

$\bigcap^p \rightarrow$  assume that this is a parabola with maxima at  $t = p$

$$t_p = \frac{v_{0x} \sin \alpha}{g}$$

$$x_p = \frac{(v_{0x} \sin \alpha)^2}{2g}$$

$$R = (v_{0x} \sin \alpha)t$$

$$y_t = (v_{0x} \sin \alpha)t - \frac{1}{2}gt^2$$

$$x_t = (v_{0x} \sin \alpha)t$$

$$\Rightarrow t = \frac{x}{v_{0x} \cos \alpha}$$

$$\therefore y_t = (v_{0x} \sin \alpha)\left(\frac{x}{v_{0x} \cos \alpha}\right) - \frac{1}{2}g\left(\frac{x}{v_{0x} \cos \alpha}\right)^2$$