2D Motion cont. PH 111

1. Projectile motion
   analyze the motion in each dimension separately
2. Circular motion

$\vec{r} = x\hat{i} + y\hat{j}$ $x^2 + y^2$

$\dot{\vec{x}} = 0$ $\Delta\vec{v} = 0$ $\vec{a} = 0$

$\vec{v}_{inst}$ speed $v = \frac{disp}{t} = \frac{2\pi r}{T}$ T = period, time to complete one trip around the circle

$\vec{v}_{tan}$ $\vec{a} = \frac{\Delta\vec{v}}{\Delta t}$ $\Delta\vec{v} = \vec{a}\Delta t$

All objects that move along a curved path must have a centripetal acceleration $\vec{a}_c$

$\vec{a} = \vec{a}_c + \vec{a}_{tan}$ $a_c = |\vec{a}_c| = \frac{v^2_{tan}}{r}$

* $\vec{a}_c$ always = negative, points to origin
* $\vec{v}_{tan}$ tangent to the circle