Reading Assignment for October 30
Sections 7.1 and 7.2

Please notice that this file is two pages long.

7.1 - Describing Circular and Rotational Motion

- To locate an object going around a circle, it is easiest to give the angle = angular position.
- For various reasons, we introduce two more angle units here: radians and revolutions.
- When angle is in radians, arclength $s = r\theta$, which leads to $360° = 2\pi\, rad$.
- $1\, rev$ = once around a circle, so $1\, rev = 360° = 2\pi\, rad$.
- Angular displacement is simply $\Delta\theta = \theta_f - \theta_i$.
- Angular velocity $\omega = \dfrac{\Delta\theta}{\Delta t}$.
- The official unit of ω is rad/s though in the U.S. we like the $rev/min = RPM$.
- To relate linear and angular velocity, we have $v = \omega r$. The angular velocity *must* be in rad/s to use this equation.

7.2 - The Rotation of a Rigid Body

- This is where we say goodbye to the particle model!
- Rigid body - "big" object that doesn't change shape when rotating.
- Every point on a rotating rigid body has the same angular velocity, ω.
- Angular acceleration, α - the rate at which angular velocity changes.
- Graphs for Rotational Motion - A nice reminder of chapter 2, but we probably won't have time to do this in class.
- Every point on a rotating rigid body has two linear accelerations - the centripetal and tangential accelerations.

- Centripetal acceleration - we've studied already. Points toward the center. $a_c = \frac{v^2}{r} = \omega^2 r$. Due to changes in direction.

- Tangential acceleration - in the same direction as the linear velocity, $\vec{\mathbf{v}}$ (and so at 90° to $\vec{\mathbf{a}}_c$). Due to changes in speed. $a_t = \alpha r$.

The Quiz is at: www.masteringphysics.com/site/login.html