Reading Assignment for October 14
Sections 9.1 through 9.3

9.1 Impulse

- Impulse - $\overrightarrow{\mathbf{J}}$ (All the obvious letters were taken)
- For a constant force, $\overrightarrow{\mathbf{F}}_c$ impulse is force multiplied by how long the force is exerted, $\overrightarrow{\mathbf{J}} = \overrightarrow{\mathbf{F}}_c \Delta t$
- We often just think about the average force acting on an object, $\overrightarrow{\mathbf{F}}_{av}$, since that's guaranteed to be a constant force
- For changing forces, we have to make a graph of force versus time and find the area

9.2 Momentum and the Impulse-Momentum Theorem

- Rewriting Newton's Second Law gives $\overrightarrow{\mathbf{F}}_{av} = \dfrac{m\overrightarrow{\mathbf{v}}_f - m\overrightarrow{\mathbf{v}}_i}{\Delta t}$
- Momentum, $\overrightarrow{\mathbf{p}} = m\overrightarrow{\mathbf{v}}$ (All the obvious letters were taken). Unit $= kg \cdot m/s$
- Second Law: $\overrightarrow{\mathbf{F}}_{av} = \dfrac{\Delta \overrightarrow{\mathbf{p}}}{\Delta t}$
- Impulse-Momentum Theorem: Impulse = change in momentum. $\overrightarrow{\mathbf{J}} = \Delta \overrightarrow{\mathbf{p}}$
- Hard to show but the impulse-momentum theorem holds not only for constant forces but *also for changing forces*!!
- For a collection of particles, we find the total momentum $\overrightarrow{\mathbf{P}}$ (capital P) by doing vector addition

9.3 Solving Impulse and Momentum Problems

- The impulse approximation - only "big" forces effect the motion of an object over short time periods
- Read the examples carefully, we'll see similar problems on the homework and next exam