


Thursday, October 24/13
Physics 122/121

Midterm - Tentatively: Wed., Nov. 22

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1. **Unit 1 Test -> Friday, Oct. 25/13**  See the Next Page
 2. Worksheet: Circular Motion
 3. Unbanked Curves
 4. L1 - Banked Curves
 5. L1 - Vertical Circular Motion



Test: Unit 1 - Dynamics Extension

- Six Problems: 1. Force Problems (2) *hill + kin. push/pull*
 2. Torque Problem (L1 and L2)
 3. 1D Collision (Elastic/Inelastic)
 4. 2D Collision
 5. Relative Velocity (L1 and L2)

Formulas will NOT be provided.

Force Problems	Torque	Collision
$\vec{F}_{net} = m\vec{a}$ $F_f = \mu N$ $W = mg$ $\vec{v}_f = \vec{v}_i + \vec{a}t$ $v_f^2 = v_i^2 + 2\vec{a}d$ $d = \vec{v}_i t + \frac{1}{2}\vec{a}t^2$	$\tau = rF\sin\theta$ <p style="text-align: center;">CW (-) CCW (+)</p>	$\vec{p} = m\vec{v}$ $m_1\vec{v}_1 + m_2\vec{v}_2 = m_1\vec{v}_1' + m_2\vec{v}_2'$ <p style="text-align: center;">1D</p> <p style="text-align: center;">elastic $\Delta E_K = 0$ inelastic $\Delta E_K = -\Delta E$</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> $E_K = \frac{1}{2}mv^2$ </div> $\Delta E_K = E_{K1}' + E_{K2}' - (E_{K1} + E_{K2})$
<p>2D:</p> $m_1v_{1x} + m_2v_{2x} = m_1v_{1x}' + m_2v_{2x}'$ $m_1v_{1y} + m_2v_{2y} = m_1v_{1y}' + m_2v_{2y}'$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 5px;"> $\begin{bmatrix} v_{2x}' \\ v_{2y}' \end{bmatrix} \rightarrow \begin{bmatrix} v_2' \\ \text{mag} + \text{direction} \end{bmatrix}$ </div>		

Relative Velocity

Boat: $\vec{V}_{BS} = \vec{V}_{BW} + \vec{V}_{WS}$
 $\vec{R} = \text{Component} + \text{Component}$

Plane: $\vec{V}_{pg} = \vec{V}_{pa} + \vec{V}_{ag}$
airspeed wind

Law of Pythagoras $R = \sqrt{A^2 + B^2}$

SoH CAH ToA

$$\vec{v} = \frac{J}{t} \quad || \quad v = \frac{d}{t}$$

$\vec{v} \rightarrow \text{km/h}$
 $J \rightarrow \text{m}$