Final Exam: May 13th, Wednesday
Time: 8:30-11 am (arrive by 8:15 am)
Room: Cullimore Lecture Hall 3.
Check website for formula sheet

Preparing for final exam:
Solve old final exams posted on web !!
Solve quiz problems !!
Solve three common exam problems.
Review today: 5-6 examples
1. A projectile is launched from a level plane at 30 degree from horizontal with an initial speed of 88.5 m/s. What is the maximum height above the plane the projectile will reach?

2. A rifle is aimed horizontally at the center of a large target 60 m away. The initial speed of the bullet is 240 m/s. What is the distance from the center of the target to the point where the bullet strikes the target (XY)?
3. A 8-kg block is pulled along a rough horizontal surface \((\mu_k = 0.2)\) by a rope that exerts an 30 N tension force directed 30 degree above the horizontal. What is the magnitude of the friction force on the block?

\[
\begin{align*}
\text{T} & \quad \text{30\degree} \\
8 \text{ kg} \\
\end{align*}
\]

4. Two blocks with the masses of 7.1 kg and 3.6 kg (their weights are approximately 70N and 35N) are connected by a string as shown. If the pulley is massless and the surface is frictionless, the magnitude of tension in the string is ______. 

\[
\begin{align*}
70 \text{ N} \\
\text{pulley} \\
35 \text{ N} \\
\end{align*}
\]
5. Two blocks are connected over a pulley as shown in the figure. The mass of the block A is 10 kg and the mass of the hanging block B is 8 kg. The block A slides up the 40 degree-incline at a constant speed. There is a friction force between the incline and the block A.

(a) Find the tension in the string.
(b) Find the normal force that the incline exerts on block A.

6. A vertical spring stretches 8 cm when a 1.6 kg block is hung from its end.

(a) What is the spring constant of the spring?
(b) What is the Elastic Potential Energy of the spring?
7. An athlete of mass 70 kg on a trampoline leaps straight up into the air with an initial speed of 9.0 m/s. Find the kinetic energy of the athlete when she is halfway up to her maximum height.

8. iClicker Quiz

A 0.2-kg rubber ball is dropped from the window of a building. It strikes the sidewalk below at 30m/s and rebounds up at 20m/s. The impulse on the ball during the collision is:
A. 10N · s upward
B. 10N · s downward
C. 2.0N · s upward
D. 2.0N · s downward
E. 9.8N · s upward