Physics 271, Fall 2017
Homework 2
Due date: Monday Sept. 18, 2017

Reading: Chapter 1,2 Kleppner and Kolenkow

1. K&K 1.19: Relative velocity

2. K&K 1.24: Motion on a bead of rolling wheel.
   \textit{Hint}: First describe the motion in the reference frame in which the center of the wheel is stationary. Then transform to the reference frame of the earth.

3. K&K 1.26: Projectile motion on a hill
   \textit{Hint}: The equation satisfied by the hill is $y_{\text{hill}} = -x_{\text{hill}} \tan \phi$, where $\phi$ is the angle between the horizontal and the hill surface.

4. K&K 2.2: Two blocks connected by a string

5. K&K 2.6: Mass in a cone
   \textit{Hint}: The normal force has components that counteract the weight, as well as provide centripetal force.

6. K&K 2.7: Pole leaning against a wall

7. K&K 2.9: Three masses, a pulley and a table
   Note that the pulley is massless, so all the forces acting on it must add up to zero.

8. K&K 2.11: Mass on a wedge

   Note that the string exerts a force on $M_1$ (through the pulley holder).

10. OPTIONAL: K&K 2.14: “Pedagogical” machine, part 2