Pre-Lab Practice: Friction

Review the Textbook:

- *PHYS 1401: Serway & Vuille: Section 4.6, Examples 4.13* and 4.14.
- *PHYS 2425: Serway & Jewett: Section 5.8, Examples 5.12 and 5.13.*

A 1200 kg car traveling along a horizontal road at speed of 30 m/s (about 65 MPH) runs into an icy patch. The car skids to a stop. Assume the coefficient of kinetic friction between the tires and ice to be 0.1.

1. What is the normal force exerted on the car?
(11760 N)

2. What is the magnitude of a kinetic friction force acting upon the car?
(1176 N)

3. What is the magnitude of the acceleration of the car?
(0.98 m/s^2)

4. How much time does it take the car to stop?
(30.6 s)

5. How far does the car go in that time?
(459 m)

6. In Figure 4, $m_1 = m_2 = 300$ g. If the surface of the table is frictionless, what is the acceleration of the system?
(4.9 m/s^2)

7. In Figure 4, $m1 = m_2 = 300$ g. If the surface of the table has a coefficient of friction of 0.5, what is the acceleration of the system?
(2.45 m/s^2

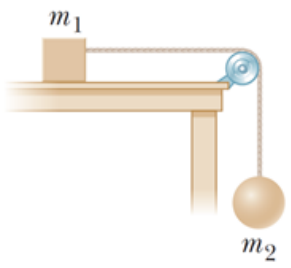

Figure 4. A system of masses connected over a pulley.