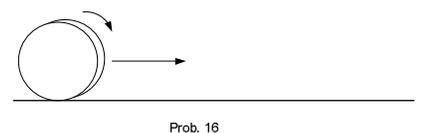
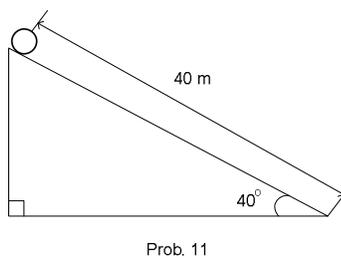
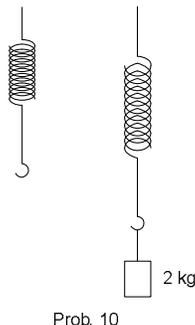
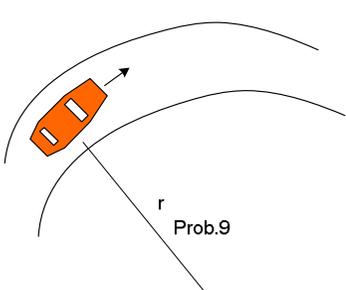
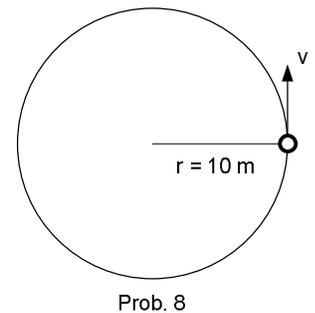
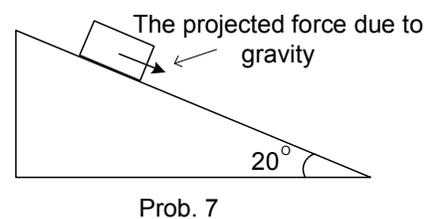
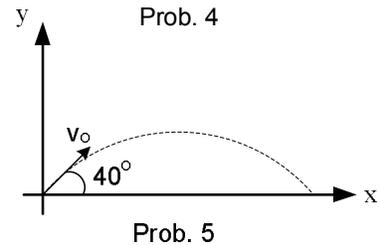
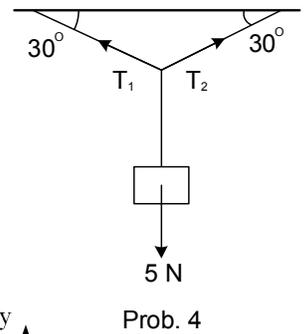
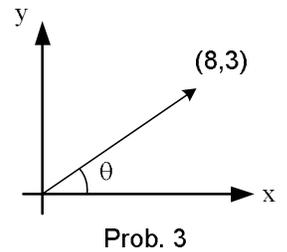
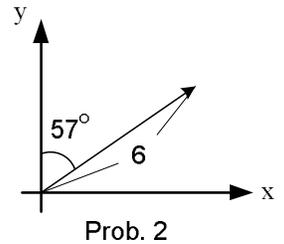


## Short Questions for Physics 111 Final (Fall 2007)

1. An object moves from rest to 50 m/s. If the distance that the object travels is 120 m, what is the acceleration?
2. What is the x- and y-components of the vector?
3. The tip of the vector has (x,y) coordinate as shown. What are the angle,  $\theta$ , and the magnitude of the vector?
4. What are the tensions for  $T_1$  and  $T_2$ ?
5. For the projectile motion in the figure, answer these questions.  $v_0 = 10$  m/s.
  - a. What is the x-component of the initial velocity?
  - b. What is the y-component of the initial velocity?
  - c. How long will it take to reach the ground?
  - d. What is the horizontal distance of the launched object?
6. A block is sliding on a flat plane. The coefficient of kinetic friction is  $\mu_k=0.020$ . The initial velocity is 6.0 m/s. When the block stops, what is the distance traveled? Use Work-Energy Theorem.
7. There is a block ( $m = 3.0$  kg) on an inclined plane. Answer the following questions.
  - a. Find the force projected on the plane due to the gravity.
  - b. Find the normal force.
8. An object moves along a circle uniformly. The (tangential) speed of the object is 8.0 m/s and the radius is given in the figure, what is the period of the motion?
9. You are driving a car at 20.0 m/s, and it is going into a curve. The radius of the curvature is 80.0 m, and the mass of the car is 1200 kg. What is the centripetal force acting on the car?
10. After hanging a weight, the spring is stretched by 0.20 m.
  - a. What is the spring constant?
  - b. How much is the energy that the spring has after stretched?
11. An object slides down on a frictionless inclined plane. What is the final velocity of the object when it reaches the bottom?
12. An object moves linearly at constant velocity 5.0 m/s. If the mass of the object is 10.0 kg, what is the momentum?
13. Estimate the gravitational force between a 65-kg woman and a 75-kg man when they are 1.6 m apart. (This mimics the gravitational force between spheres.)
14. What is the angular velocity when the change of the angle is  $\pi/2$  radians for 2.0 seconds?
15. You have a dumbbell-shaped object which has a moment of inertia,  $0.29$  kg $\cdot$ m<sup>2</sup>. If the angular acceleration is  $3.6$  rad/s<sup>2</sup>, what is the torque of the motion?
16. A disk is rotating on a flat plane. If the linear velocity is 5.0 m/s, the mass is 5.0 kg, and the radius of the disk cylinder is 0.10 m, what is the rotational kinetic energy?



## Answer Keys

1.  $a = 10.2 \text{ m/s}^2$
2. x-component = 5.03; y-component = 3.27
3. magnitude = 8.54;  $\theta = 20.6^\circ$
4.  $T_1 = 5 \text{ N}$ ;  $T_2 = 5 \text{ N}$
5. (a)  $v_x = 7.66 \text{ m/s}$ ; (b)  $v_y = 6.43 \text{ m/s}$ ; (c)  $t = 1.31 \text{ s}$ ; (d)  $x = 10.03 \text{ m}$
6.  $x = 91.8 \text{ m}$
7. (a) 10.1 N; (b) 27.6 N
8. 7.85 s
9. 6000 N
10. (a) 98 N/m; (b) 1.96 J
11. 22.4 m/s
12. 50 kg m/s
13.  $1.27 \times 10^{-7} \text{ N}$
14. 0.79 rad/s
15. 1.04 Nm
16. 31.3 J