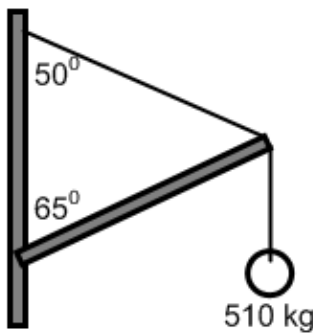


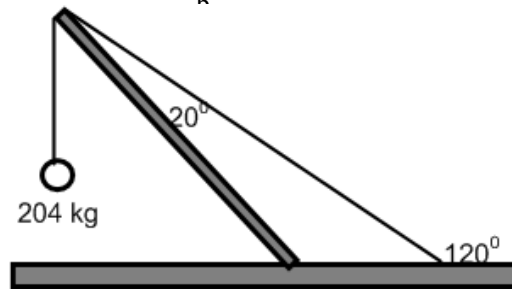
1. A ball is dropped from a height of 20.0 m. Calculate the time to hit the ground, the final velocity.
2. A bullet is fired with an initial velocity of 300 m/s from the ground at an angle of elevation of  $37^\circ$ . Calculate the maximum height, the total time in the air, the range
3. A 20 kg object is on a  $15^\circ$  slope that is 10.0 m long. It has a coefficient of friction of 0.2. Calculate the time to slide down, the final velocity at the bottom.
4. A baseball is thrown from the roof of a 40.0 m building with an initial velocity of 20.0 m/s at  $37^\circ$ . Find the time to strike the ground and the range.
5. A golf ball is given an initial velocity of 40 m/s at  $40^\circ$  toward the green that is elevated 5.0 m above the golfer. If the horizontal distance to the hole is 150 m, how far from the hole does the ball land?
6. A man walks 25.0 m at  $37^\circ$  then 40.0 m at  $240^\circ$  then 15.0 m at  $160^\circ$ . Find the magnitude and direction of the resultant displacement.
7. Two horses are attached to a 500 kg sled via ropes. If horse A applies a force of 200 N at  $130^\circ$  and horse B applies a force of 300 N at  $53^\circ$ , find the resultant force acting on the sled.

8. Find all the forces acting at the end of the "strut". Assume that the strut weighs nothing.

a.



b.



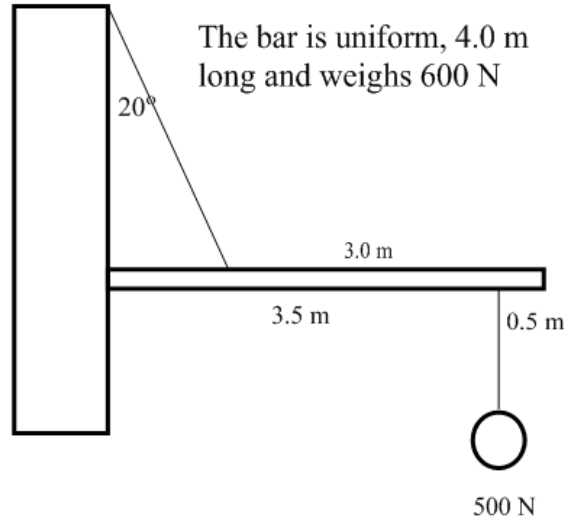
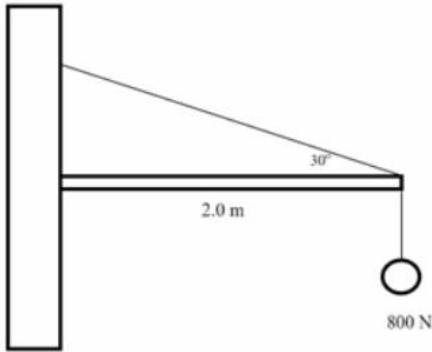
9. An 80.0 kg block rests on a  $30^\circ$  slope, 20 m long, where the coefficient of friction is 0.15. Find the time to slide down the hill and the speed at the bottom.
10. A 0.45 kg shuffleboard puck is given an initial velocity of 4.5 m/s. If the coefficient of friction is 0.25, how far will the puck slide?
11. A 50 kg crate slides down a 5.5 m loading ramp that makes an angle of  $20^\circ$  with the ground. If the coefficient of friction is 0.3, find the time it takes to reach the bottom.
12. A swimmer wishes to cross a river that flows with a current of 2.0 m/s at  $090^\circ$ . If the swimmer can swim with a speed of 3.0 m/s, find the heading she should take so that she reaches the other shore directly across from her point of origin.
13. David can row a boat with a speed of 3.5 m/s and wishes to row his boat directly across a river that flows with a velocity of 1.3 m/s at  $090^\circ$ . Find the direction that he should head and find the resultant velocity.

14 Find the resultant of each group of vectors

- A. 25 m at  $300^\circ$   
50 m at  $160^\circ$   
80 m at  $200^\circ$
- B. 60 m at  $030^\circ$   
40 m at  $290^\circ$   
25 m at  $130^\circ$
- C. 25 m at  $290^\circ$   
80 m at  $060^\circ$   
100 m at  $225^\circ$

15 Find the forces acting in the bar in each of the diagrams.

Assuming the bar is uniform, 2.0 m long and weighs 500 N, find all the forces acting on the bar.



16. A bar 5.00 m long has a 50.0 N weight attached from one end and an 80 N weight attached from the other end. Determine the magnitude, direction, and point of application of the equilibrant force.

17. A bridge is 80.0 m long and it supports a 2000 kg car 30.0 m from one end. Find the force exerted by the piers at each end.

18. A helicopter leaves Hampton and travels to Moncton, 110 km @  $070^\circ$ . He then flies to Fredericton, which is 160 km @  $300^\circ$  and then flies from Fredericton back to Hampton. Find: a. the displacement from Hampton to Fredericton.  
b. the displacement from Fredericton to Hampton c. If the helicopter flies at a speed of 150 km/h, how long will the **whole** trip take (from Hampton back to Hampton)?

19. If the displacement from Hampton to Fredericton is 100 km at  $340^\circ$  and the displacement from Hampton to St. Stephen is 150 km at  $250^\circ$ , find the displacement from Fredericton to St. Stephen

20. A 2040 kg elevator is moving down with a velocity of 5 m/s. Find the force that the cable would have to apply so that it stops in 6 seconds. How far would the elevator move while it was slowing down.

**Note: The only type of problem not covered on the review sheet is “Graphing of Motion” but that will be on the exam**