

Chapter 5 Problem Set
Advanced Physics

1. If two evenly matched teams are competing in a tug-of-war contest. Is work done anywhere in the system?
2. A frictionless slide is installed at the playground by '02. It is flexible and can be changed into different shapes. How will the velocity change of the students at the bottom of the slide if a large bump is placed in the middle?... a loop is placed in the middle?
3. If a student in '05B second floor buys a 42" plasma TV that has a mass of 20.0kg. The student finds it does not fit up the stairs and has to tie a rope around it and raise it up in the commons with total work of 600.0J. How high is the second floor?
4. A student goes to Walgreens and pushes a cart down the aisle with a 35N force at 20.0° down from the horizontal. How much work does she do in a 50.0m stretch from the back of the store to the check-out?
5. A 2.50kg block is pushed 2.20m along a frictionless table by constant force of 16.0n acting 25.0° below the horizontal. Determine the work done by the applied force, the normal force, the force of gravity and the net force on the block.
6. A 700.0n student does a pull up in wellness class with a force of 355n from each arm. The distance the student's center of gravity rises is .250m. What is the students velocity at the top?

7. An IMSA Titan baseball player throws a .150kg ball at a 30.0° from the ground toward home plate with a velocity of 40.0m/s. What is the kinetic energy at the peak of the flight of the ball?

8. A .250kg pendulum bob with a 2.00m string is raised to 25.0° from the vertical. If the bob is released what will its velocity be at the lowest point?

9. A 50.0kg student is sledding down the hill by the hex on a cafeteria tray. If the student's velocity is 9.50m/s, how high is the hill? (Assume no friction.)

10. A toy gun fires a .020kg marble 20.0m vertically into the air by compressing a spring .120m. What is the velocity of the marble as it just leaves the spring. (The 20.0m includes the .120m compression.)

11. A 1500.0kg race car reaches 10.0m/s in 3.0s from a standing start. Find the work done by the car and the power the car exhibited in watts and horsepower.