

PAL Problem Set 18 for Phys 5A (Work-Kinetic Energy Theorem)

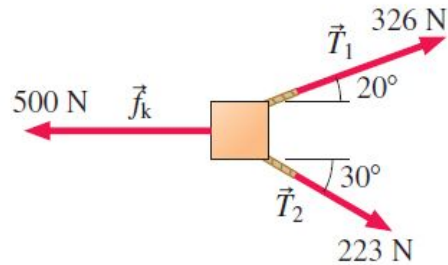
Always explain your answers and show your work.

Problem 1 - Puck B has three times the mass of puck A. Starting from rest, both pucks are pulled the same distance across frictionless ice by strings with the same tension.

- A. Compare the final kinetic energies of pucks A and B.
- B. Compare the final speeds of pucks A and B.

Problem 2 - The two ropes shown in the bird's-eye view are used to drag a 30 kg crate 3.3 m across the floor.

- A. Calculate the work done by each force.
- B. Assuming that the crate was initially moving at $v_i = 1.2$ m/s, what is its final velocity?



Problem 3 - You are comfortably sitting in a treehouse when you remember that you forgot to bring your book. Your brother, who is down in the yard, offers to tie it to the treehouse elevator and all you need to do is pull it up. You apply a force of 4.5N to the 400 g book as you bring it up 6 meters to the treehouse.

- A. Draw the free-body diagram for the book making sure to clearly and fully label each force. Also clearly indicate if one force is greater than another.
- B. How much work does the force of gravity do on the book? Is this work positive or negative?
- C. How much work do you do on the book? Is this work positive or negative?
- D. What is the speed of the book when it reaches the top?

