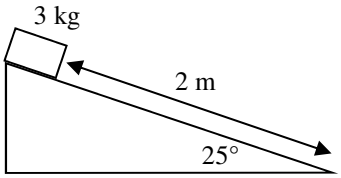
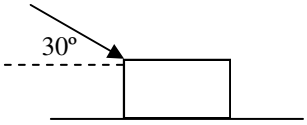
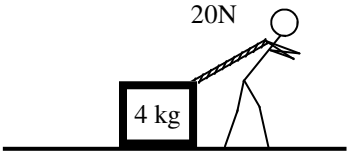
PreAP Energy 2



1. A 3 kg object is 2 m up a ramp tilted at 25°.
   A. What kind of energy does it have at the top?
   B. What kind of energy is it gaining as it slides down?
   C. * Calculate its energy at the top, remembering that h must be vertical.



2. A 25 N force pushes a box 3.2 meters at an angle of 30^{o} to the surface.
   A. Which portion of the force moves the object: x or y?
   B. As it moves because of work, the object gains what kind of energy?
   C. * Find the work done by this force, remembering that only the parallel part of the force does work.



3. Slim Jim pulls on a box with 20N for 15m. His force pulls at an angle of 40º.
   A. * Calculate the work done on the box.

   B. So, how much kinetic energy must the box have afterwards, assuming no friction?

   C. Calculate the final velocity of the box.

4. A 3 kg ball is thrown upward into the air. The ball reaches a height of 20 m.
   A. What kind of energy does it have just after it is thrown (at the bottom)?
   B. What kind of energy does it have after (at the top)?
   C. Calculate the energy at the top.

   D. * How much PE did it have 3/4 of the way to the top?

Power is how fast energy is transferred. If two forces transfer energy and one transfers it faster, the faster one uses more power.

P	watts	Power	Rate (how fast) work is done

$$P = \frac{W}{t}$$

5. Motor A has a rating of 300 W. Motor B has a rating of 200 W.
   A. Which motor is more powerful?
   B. * How long would it take Motor A to do 6000 J of work?

   C. How long would it take Motor B to do 6000 J of work?

   D. Which motor did the work quicker?
   E. Which motor did more work?

6. True or false (and why)?: "*A more powerful object does more work*."

1C) $h = 2\sin 25°$
2C) $Fx = 25\cos 30°$
3A) 230 J of work. $Fx = 20\cos 40°$
4D) 3/4 way up means $h = (3/4)20 = 15$ m
5B) $P = W/t$, so $t = W/P$, so $t = 6000/300 = 20$ sec