Energy 2

Refer to "Work and Energy" and "Simple Machines Made Simple" notes or the website.

1. Write down the saying that helps us understand simple machines:

    Using the above saying, solve the following problems:

2. A person lifts a 300 N object with 20 N of force. Find the mechanical advantage of the simple machine.

3. A person uses a 8 m long ramp to lift a 16 kg object up to the top of a 1.2 meter tall truck bed.
    A. Find the MA of the ramp.

    B. How heavy (not massive) does the object seem on the ramp?

4. On the ramp on the right label Fin, Fout, De, Dr.

    12 kg

5. It takes 120 N to lift a 500 N object up 3 m. To do this
    a person uses a pulley and pulls 15 m of rope out of the
    pulley. Assign these variables: Fin, Fout, De, and Dr,
    then find the efficiency of the pulley system. (See ex.2 *"Simple Machines Made Simple".*)

6. A 25 N force pushes a box 3.2 meters at an angle of 30° to the surface. Find the work done by this force.

7. Motor A has a rating of 300 W. Motor B has a rating of 200 W. (See back of "*Work and Energy*.")
    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?

8. Label the following as Work (W), Kinetic Energy (Ek), Potential Energy (Ep), or Elastic Potential Energy (PEel):
    A. ___ A car going 20 m/s.
    B. ___ A rubber ball is compressed.
    C. ___ A dish is at the edge of a 1.4 m table.
    D. ___ Friction acting on an object for 3 m.

9. A 3 kg ball is thrown up into the air. The ball goes 20 m up into the air.
    A. When thrown the ball has what kind of energy?
    B. When it reaches the top what kind of energy does it have?
    C. According to the Law of Conservation of Energy these two energies are:
    D. **On the back** use Conservation of Energy (not "Freefall" or Kinematics) to calculate how high the ball goes into
    the air. *(See the back side of "Work and Energy" for help.)*