Due Nov 8 (Thurs)

2007 PreAP Energy 3

1. For the following, decide if energy is added, subtracted, or just transferred (no change of energy):
   A. ___A car gains speed.
   B. ___A ball drops.
   C. ___Friction slows an object down.
   D. ___A moving ball compresses a spring.
2. When something seems to gain energy, what had to have happened to the object?
3. When something seems to lose energy, what had to have happened to the object?
4. On which side of our equation do we always put work?
5. In order to have potential energy, an object must have what? (Your equation can be helpful.)
6. In order to have elastic potential energy, an object must have what?
7. For work to be done there must be a _____.
8. For an object to have kinetic energy it must have what?
9. Can an object have kinetic energy and be at rest?
10. Can an object have potential energy and be moving?
11. A ball is 15 meters up in the air. How fast is it going 5 meters above the ground?
    A. What kind or kinds of energy does it have before?
    B. What kind or kinds of energy does it have after?
    C. Find the velocity.

12. A spring with a spring constant of 0.25 N/m is compressed 1.5 meters. It releases and shoots a 2 kg object.
    A. What kind of energy compressed the spring to begin with?
    B. What kind of energy does the spring have when compressed?
    C. What kind of energy does the spring's energy turn into?
    D. Find the velocity of the object when it is shot.

13. A 3 kg object moving 4 m/s ends up going 6 m/s after a force pushes on it for 2 m.
    A. What kind or kinds of energy did it have before?
    B. What kind or kinds of energy did it have after?
    C. Does before equal after?
    D. Why or why not?
    E. Solve for the magnitude of the force.

14. A 100kg car is going 10 m/s. A force pushes on it to speed it up to 20 m/s.
    A. If a force pushed on it for 10 m, find the strength of the force.

    B. How would the distance change if the mass of the car was doubled?

15. A 2 kg object going 4.5 m/s stops when it compresses a spring (spring constant is 1.2 N/m).
    Find how far the spring was compressed.

16. A 6 kg object going 10 m/s stops because of friction.
    If the force of friction is 2.3 N, find how far it takes to stop it.

17. A 15 kg object going 8 m/s slows down to 3 m/s in 5 m. Find the force of friction that slowed down the object.

18. 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?

19. Comparing a 75 W light bulb with a 100 W light bulb, which one does more work?