Efficiency

Remember:

Power = rate of using energy   (J/s or Watts)

   $P = E/t$ …or…. $P = W/t$

% efficiency = <u>useful energy out of device</u> x 100%
                          actual energy put into device.

1. If you must do 500 J of work to operate a pulley system and the pulley system lifts a 150 N load to a height of 3.0 m, how efficient is the pulley system? **(90%)**

2. A kettle that is 80% efficient is rated 1200 W. At what rate does the water in the kettle absorb energy (in watts).   **hint – use equivalent fractions. **(960 J/s)**

3. If a fluorescent light bulb has an efficiency of 85%, at what rate does a 60 W bulb produce light energy?   If the 'wasted' energy is in the form of heat, at what rate does it produce heat energy? **(51 W, 9 W)**

4. For every megajoule of chemical potential energy in the diesel used to run a truck only 120 kJ of useful work is done by the truck in making itself move. How efficient is the truck? where are some of the places that energy from the fuel is wasted? **(12%)**