

## HOW TO SOLVE PROBLEMS INVOLVING CONSERVATION OF MECHANICAL ENERGY

1. Total mechanical energy consists of kinetic, gravitational potential and elastic potential energies.

$$E = E_k + E_{gp} + E_e = \frac{mv^2}{2} + mgh + \frac{kx^2}{2}$$

2. Identify if there is any work done on the object by external force or work done by the object (which results in the energy transformation from mechanical into other kinds of energy i.e. heat, sound etc.).

3. If no work done then **total** initial energy must be equal to the final.  $E_0 = E$ .

4. Write total initial energy, including all 3 types of mechanical energy. Remember that gravitational potential energy can not be calculated until you decide where it will be equal 0.

Elastic potential energy equal 0 always where spring involved is not stretched or compressed at all.

5. Write total final energy, including all 3 types of mechanical energy.

6. Equalize them and solve obtained equation.

7. If work done by external force or by the object then  $E = E_0 \pm W$ .