Chapter 7   Potential Energy and Energy Conservation

Example 1:
Calculate the change in the gravitational potential energy of a 10 kg mass that is raised 3.5 m.

Example 2:
A 750 N/m spring is stretched 0.124 m from its unstretched length. How much energy is required to do this?

Example 3:
A block starts at the top of a smooth 30° incline. Find the block's final speed if it starts from rest and it slides 2 m along the incline.

Example 4:
A 1.2 kg block is connected to a 2.3 kg block by a rope and pulley system. The 1.2 kg block hangs over the end of a table while the 2.3 kg block is at rest on the smooth horizontal tabletop. Find the 1.2 kg block's final speed after it has fallen 1.5 m.

Example 5:
A block is projected up a rough 30° incline whose coefficient of friction is 0.67. Calculate the distance the block travels along the incline before stopping if its initial speed is 2.4 m/s?

Example 6:
A 0.24 kg block starts from rest at the top of a 53° incline 1.75 m above the floor. The block is released and it slides down the incline and out onto a smooth horizontal surface where it collides with a spring. Find the distance the spring is compressed when the block momentarily stops. The spring has a 148 N/m spring constant. (Assume the spring is neither stretched nor compressed initially.)

Example 7:
A 12 kg block starts from rest at the top of a smooth 45° ramp. It slides 2.5 m along the ramp and then slides out on to a rough horizontal surface. If the block slides 3.7 m across the horizontal surface before stopping what is the coefficient of friction?

Example 8:
A spring is connected to the upper end of a smooth 37° incline and to a 10 kg block that rests on the incline. If the spring has a 1230 N/m spring constant and the block is released from rest when the spring is compressed 0.2 m, how much is the spring stretched when the block momentarily stops?

Example 9:
A 4 kg mass is dropped on a 7250 N/m spring from a height of 1.25 m above the top end of the spring. What is the maximum distance that the spring is compressed? (Assume the spring is neither stretched nor compressed initially.)