Name:

**Work Problems:**

1. A shopper in a supermarket pushes a cart with a force of 85 N directed at an angle of 60° from the horizontal. Find the work done by the shopper on the cart as the shopper moves along a 25m length of aisle.
2. A worker pushes a 2,500 N crate with a horizontal force of 450 N a distance of 100.0 m. Assume the coefficient of kinetic friction between the crate and the floor is 0.18.
   1. How much work is done by the worker on the crate?
   2. How much work is done by the floor on the crate?
   3. What is the net work done on the crate?

**KE Problems**

1. An 1800 kg car starts from rest at the top of a driveway that is sloped at an angle of 30.0° with the horizontal. An average friction force of 2400 N impedes the car’s motion so that the car’s speed at the bottom of the driveway is 5.8 m/s.
   1. What is the length of the driveway?
   2. Friction does 400 J of net work on a moving car. How does this affect the kinetic energy of the car?

**PE Practice Problems:**

1. A 80.0 kg student is on a tire-swing that is attached to ropes 3.00 m long. Find the gravitational potential energy associated with the child relative to the child’s lowest position under the following conditions:
   1. when the ropes are horizontal
   2. when the ropes make a 60.0° angle with the vertical
   3. at the bottom of the circular arc
2. A spring with a force constant of 8.2 N/m has a relaxed length of 4.5 m. When a mass is attached to the end of the spring and allowed to come to rest, the vertical length of the spring is 5.7 m. Calculate the elastic potential energy stored in the spring.
3. Using a bungee cord with an unstretched length of 20.0m, a 85.0 kg stuntman jumps off a bridge from a height of 55.0 m. When he finally stops, the cord has a stretched length of 45.0m. Disregard the weight of the bungee cord and assume the spring constant of the bungee cord is 68.8 N/m, what is the total potential energy relative to the water when the man stops falling?

**Mix Review:**

1. A 1500kg sports car is initially traveling 15 m/s. The driver then applies the brakes for several seconds so that 50kJ of net work is done on the car. Calculate the initial and final kinetic energy of the car.
2. A worker slides a 5 kg box across the floor, and it comes to rest after traveling 2.4m. Given that the coefficient of kinetic friction between the book and the table is 0.24, use the work–kinetic energy theorem to find the book’s initial speed.