**Bonnie and Clyde are sliding a 300 kg safe across the floor to their getaway car. The safe slides with a constant speed when Clyde pushes from behind with a 385 N horizontal force, and Bonnie pulls forward on a horizontal rope with a force of 350 N. What is the coefficient of friction between the safe and the floor?**

**Qualitative Representation**

**Variables and Equations**

**Solution (remember, show your reasoning and math)**

**Reasonability check?**

**A 2.0 kg block is attached to a rope, and the other end of the rope is attached to a toy train, which moves forward. The coefficient of static friction between the block and the horizontal surface is 0.60. When the train starts to move, how much force will it need to apply in order to get the block to start moving?**

**Qualitative Representation**

**Variables and Equations**

**Solution (remember, show your reasoning and math)**

**Reasonability check?**

**A person pushes a filing cabinet up a ramp that’s inclined 25 degrees from the horizontal, with a constant force (parallel to ramp) of 440 N, and it moves at a constant speed of 6.2 m/s. If the total mass of the filing cabinet is 82 kg, what is the coefficient of friction between the filing cabinet and the ramp?**

**Qualitative Representation**

**Variables and Equations**

**Solution (remember, show your reasoning and math)**

**Reasonability check?**

**A runner wearing spiked shoes pulls a 20 kg sled across frictionless ice using a horizontal spring with spring constant 150 N/m. The spring is stretched 20 cm from its’ equilibrium length. What is the acceleration of the sled?**

**Qualitative Representation**

**Variables and Equations**

**Solution (remember, show your reasoning and math)**

**Reasonability check?**