6. A force of 1500 N will cause a stone sled (which weighs 2150 newtons) to begin sliding across a gymnasium floor made out of dinosaur skin.

a Calculate the coefficient of friction needed to get the sled moving.

$$F = \mu_s N \qquad \mu_s = \frac{F}{N} = \frac{1500\ N}{2150\ N} = 0.7$$

b. Will it take more or less force to keep it moving once it gets started?

Less force because $\mu_K < \mu_S$

7. Water flows through a 10 foot pipe at a flow rate of 0.75 m^3/sec. It undergoes a pressure drop of 150 N/m^2. Find the resistance of the pipe.

$$R = \frac{-\Delta P}{\dot{V}} = \frac{150\ Pa}{.75\ m^3/s} = 200\ \frac{Pa \cdot s}{m^3}$$

8. The resistance in a fuel-transfer pipeline is 3 (lb/in^2) / (gal/min). The line is 6.75 inches in diameter. Fuel moves through the line at a volume flow rate of 650 gal/min. Find the pressure difference along the length of the pipeline.

$$R = \frac{-\Delta P}{\dot{V}} \qquad -\Delta P = R \cdot \dot{V}$$

$$= \left(3\ \frac{lb}{in^2}\right)\left(650\ \frac{gal}{min}\right) = 1950\ lb/in^2$$

$$\frac{gal}{min}$$

9. A fluid flows through a certain length of pipe at 0.075 m^3/sec and undergoes a pressure drop of 2000 N/m^2. Calculate the fluid resistance of the pipe.

$$R = \frac{-\Delta P}{\dot{V}} = \frac{2000\ N/m^2}{.075\ m^3/s} = 26{,}666.7\ \frac{Pa \cdot s}{m^3}$$