1. A 2.0 kg silverware drawer becomes stuck, so the owner gradually pulls with more and more force. When the applied force reaches 8.0 N, the drawer suddenly opens, throwing all the utensils to the floor. Find the coefficient of static friction between the drawer and the cabinet. (g=10 m/s²)

\[ F_s = mg \mu_s \rightarrow \mu_s = \frac{F_s}{mg} = \frac{8.0}{2.0 \times 10} = 0.4 \]

2. A box is given a push so that it slides across the floor. How far will it go, given that the coefficient of kinetic friction is 0.20 and the push imparts an initial speed of 4.0 m/s? (g=10 m/s²)

\[ \mu_k = 0.2 \]
\[ v = 4.0 \text{ m/s} \]
\[ v_0 = 0.0 \text{ m/s} \]
\[ x = ? \]

\[ F_k = ma \rightarrow a = mg \mu_k / m = g \mu_k = 2.0 \text{ m/s}^2 \]
\[ v^2 - v_0^2 = 2ax \rightarrow x = \frac{v^2 - v_0^2}{2a} = \frac{4^2 - 0}{2 \times 2.0} = 4.0 \text{ m} \]

3. A 6500 kg helicopter accelerates upward at 0.6 m/s² while lifting a 1200 kg car.
   a) What is the lift force exerted by the air on the rotors?
   b) What is the tension in the cable which connects the car to the helicopter?

\[ a = 0.6 \text{ m/s}^2 \]
\[ M_h = 6500 \text{ kg} \]
\[ m_c = 1200 \text{ kg} \]

(a) \[ F_h = ? \]

(b) \[ T = ? \]

a)

\[ F_h - (M_h + m_c)g = (M_h + m_c)a \rightarrow F_h = (6500 + 1200)(0.6 + 9.8) = 80080 \text{ N} \]

b)

\[ T - m_c g = m_c a \rightarrow T = m_c (a + g) = 1200 (0.6 + 9.8) = 12480 \text{ N} \]