A spring is attached to a wall. A 2.0 kg block is pressed against the spring. Determine the acceleration of the block immediately after it is released.

A spring is attached to a wall. When a 5 kg block is placed on the slope, the block remains at rest in the position shown. Determine the spring constant of the spring.
A spring has a length of 30 cm when a 6 kg object hangs from the bottom. When a 10 kg object hangs from the spring, it has a length of 36 cm. Determine the spring constant and the length in equilibrium.
A spring is attached to a wall. A 2.0 kg block is pressed against the spring. Determine the acceleration of the block immediately after it is released.

\[ k = \frac{300 \text{ N}}{m} \]

\[ 2.0 \text{ kg} \]

\[ \mu = 0.60 \]

\[ F_{\text{net}} = m\ a \]

\[ F_s - F_f = m\ a \]

\[ k\Delta x - \mu F_N = m\ a \]

\[ k\Delta x - \mu mg = m\ a \]

\[ a = \frac{k\Delta x - \mu mg}{m} \]

\[ = \frac{300(0.2 - 0.1) - (0.60)(2.0)(9.8)}{2.0} \]

\[ = 9.12 \text{ m/s}^2 \text{ RIGHT} \]
A spring is attached to a wall. When a 5 kg block is placed on the slope, the block remains at rest in the position shown. Determine the spring constant of the spring.

\[ F_{gx} = F_s \]

\[ mg \sin 30^\circ = k \Delta x \]

\[ k = \frac{mg \sin 30^\circ}{\Delta x} \]

\[ = \frac{(5)(9.8) \sin 30^\circ}{0.5 - 0.3} \]

\[ = \frac{123}{0.2} \]

\[ = 615 \]
A spring has a length of 30 cm when a 6 kg object hangs from the bottom. When a 10 kg object hangs from the spring, it has a length of 36 cm. Determine the spring constant and the length in equilibrium.

\[ F_s = F_g \]
\[ k(\Delta x) = mg \]
\[ k(x - x_o) = mg \]
\[ kx - kx_o = mg \]
\[ k(0.30) - kx_o = 6g \]

\[ k(0.36) - kx_o = 10g \]
\[ - (k(0.30) - kx_o = 6g) \]

\[ 0.06k = 4g \]

\[ k = \frac{653N}{m} \]

\[ x_o = \frac{x - \frac{mg}{k}}{k} \]

\[ = 0.30 - \frac{(6)(9.8)}{653} = 0.21m \]