11-34
(a) \( F_s = \mu_s N = \mu_s mg = \frac{m v^2}{R} = m R \omega^2 \) only horizontal force
\( \omega = \frac{v}{R} \)
\( \mu_s mg = \mu_s N = \mu_s \frac{m v^2}{R} \)
\( \omega = \sqrt{\frac{\mu_s g}{R}} \)

(b) Once the coin loses contact with the turntable there will be no horizontal force on the coin. There will be a kinetic friction force while it is still on the turntable but sliding off, but once it is off there will be no horizontal force and no horizontal acceleration.

11-43
(a) \( a = \frac{v^2}{R} = R \omega^2 = (6 \text{ cm}) \left( \frac{33 \frac{1}{3} \text{ rev/min}}{2 \pi \text{ rad/rev}} \right) \left( \frac{1 \text{ min}}{60 \text{ s}} \right) \) = 73 cm/s²

(b) \( ma = F_s = \mu_s N = \mu_s mg \)
\( \mu_s = \frac{a}{g} = \frac{73 \text{ cm/s}^2}{9.8 \text{ m/s}^2} = 0.075 \)

(c) acceleration because turntable is spinning faster (angular acceleration) = \( R \omega \) "tangential"
acceleration because object is going in a circle = \( v^2/R = R \omega^2 \) "radial"
\( a = \frac{\omega - \omega_0}{t} = \frac{(33 \frac{1}{3} \text{ rev/min})}{0.25 \text{s}} \)
\( a_{\text{tan}} = R \omega = 84 \text{ cm/s}^2 \)
\( a_{\text{rad}} \) is highest when \( v \) is highest, which is 73 cm/s²
\( \vec{a} = \vec{a}_{\text{tan}} + \vec{a}_{\text{rad}} \)
\( |\vec{a}| = \sqrt{(84 \text{ cm/s}^2)^2 + (73 \text{ cm/s}^2)^2} = 111 \text{ cm/s}^2 \)
\( \mu_s = \frac{a}{g} = 0.114 \)