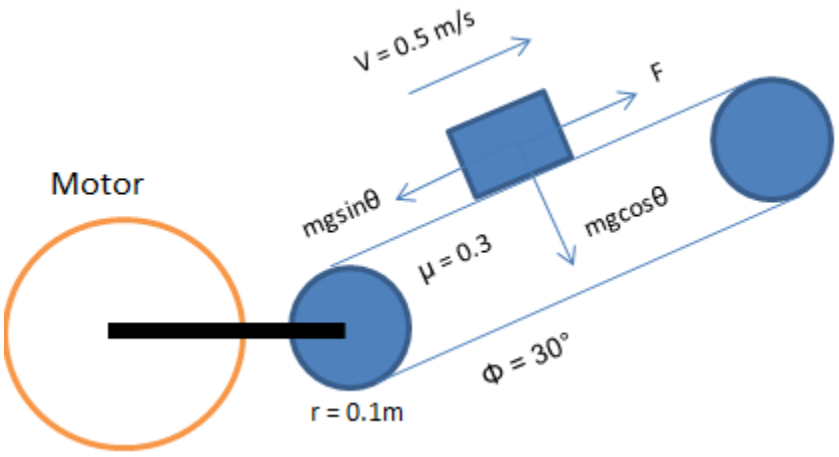

$$\omega = \frac{v}{r} = \frac{0.5}{0.1} = 5\ rad/s$$

$$N = \omega * \frac{60}{2\pi} = 5 * \frac{60}{2\pi} = 47.77\ rpm \qquad ****$$

$$F = \mu mgcos\theta + mgsin\theta = 0.3 * 10 * 9.8 * \cos(30°) + 10 * 9.8 * \sin(30°)$$

$$F = 25.46 + 49 = 74.46\ N$$

$$Load\ Torque = F * r = 74.46 * 0.1 = 7.446\ N.m$$

$$Motor\ Torque = Load\ Torque = 7.446\ N.m \qquad ****$$