Question 1:

A disc sander is pressed against a wooden surface with a force of 50N. Assuming the kinetic coefficient between the sanding pad and the wood is .6 and the diameter of the sanding disc is .2 meters, what is the torque the motor must exert to keep the disc spinning at a constant rate?

\[ M_f = \frac{2}{3} M_h \frac{F}{\text{load}} r_0 \]

\[ M_f = \frac{2}{3} \times 0.6 \times 50 \text{N} \times 0.1 \text{m} \]

\[ M_f = 2 \text{ Nm} \]

\[ T_{\text{motor}} = M_f = 2 \text{ Nm} \]