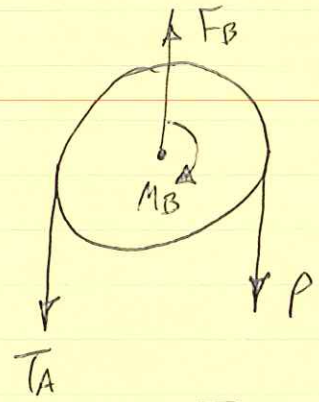


PROB. 8.140

$R_B = 20 \text{ mm}, \mu_s = 0.4, \mu_k = 0.3$

FBD DRUM B:



$\sum M_c = 0 \rightarrow$

$(0.02) T_A - (0.02) P - M_B = 0$

$P = T_A - \frac{0.3 \text{ N}\cdot\text{m}}{0.02 \text{ m}} = T_A - 15$

$P = T_A - 15$

$\frac{T_A}{P} = e^{\mu_s \beta} = e^{\mu_s \pi}$

$T_A = P e^{\pi \mu_s}$

$P = P e^{\pi \mu_s} - 15$

$P(1 - e^{\pi \mu_s}) = -15$

$P = \frac{15}{e^{\pi \mu_s} - 1} = \frac{15}{e^{\pi(0.4)} - 1} = 5.97 \text{ N}$