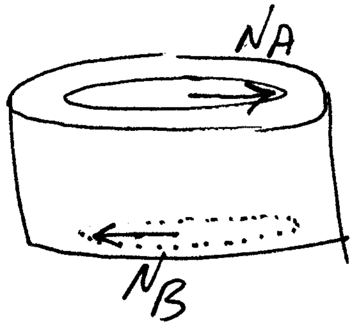
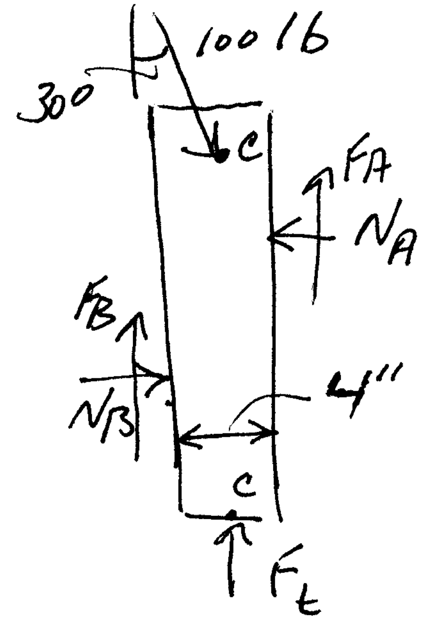
2.





N_A & N_B are contact forces between slider and sleeve. F_A, F_B are friction forces

consider slider (moves at constant speed)

$$\Sigma F_x = 100 \sin 30° + N_B - N_A = 0$$

$$\Sigma F_y = -100 \cos 30° + F_A + F_B + F_t = 0$$

$$\Sigma M\big|_{c_t} = -N_A(6) + F_A(2) + N_B(11) - F_B(2) = 0$$

sliding $\Rightarrow$ $F_A = \mu_k N_A \qquad F_B = \mu_k N_B$

$$N_A(6) - \mu_k N_A(2) = N_B(11) - \mu_k N_B(2)$$

$$N_A = N_B\left[\frac{11 - 2\mu_k}{6 - 2\mu_k}\right]$$

$$N_A - N_B = 50 \Rightarrow N_B\left[\frac{11-2\mu_k}{6-2\mu_k} - 1\right] = 50$$

$$N_B = \frac{50(6-2\mu_k)}{5}; \quad N_A = \frac{50[11-2\mu_k]}{5}$$

$$F_t = 100\cos 30^\circ - F_A - F_B$$
$$= 100\cos 30^\circ - \mu_K (N_A + N_B)$$
$$= 100\cos 30^\circ - \mu_K (10)[17 - 4\mu_K]$$

(a) $\mu_K = 0 \Rightarrow F_t = 100\cos 30^\circ = 86.6$ lb

(b) $\mu_K = 0.1 \Rightarrow F_t = 70$ lb

if sleeve is thicker, then the forces N_A & N_B would be smaller. Hence F_t would be closer to $100\cos 30^\circ$

if sleeve is thinner, N_A & N_B would be larger. F_t would even less compared to $100\cos 30^\circ$