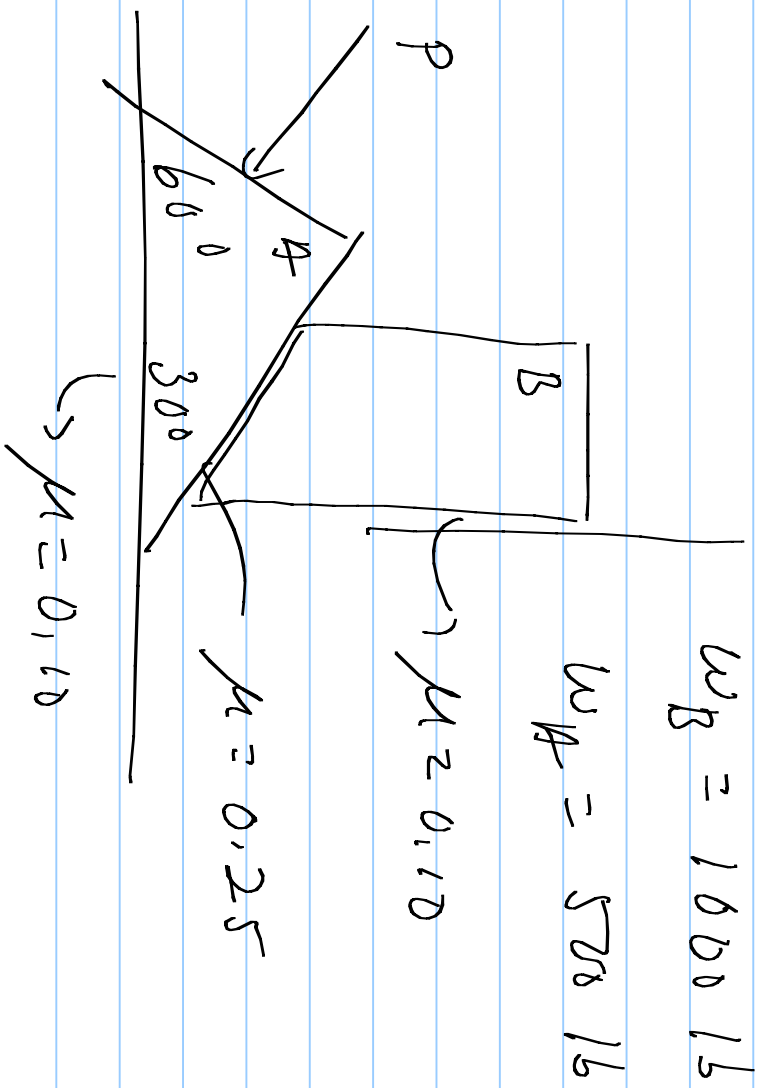


EGE R180

2/22/10

9-53)



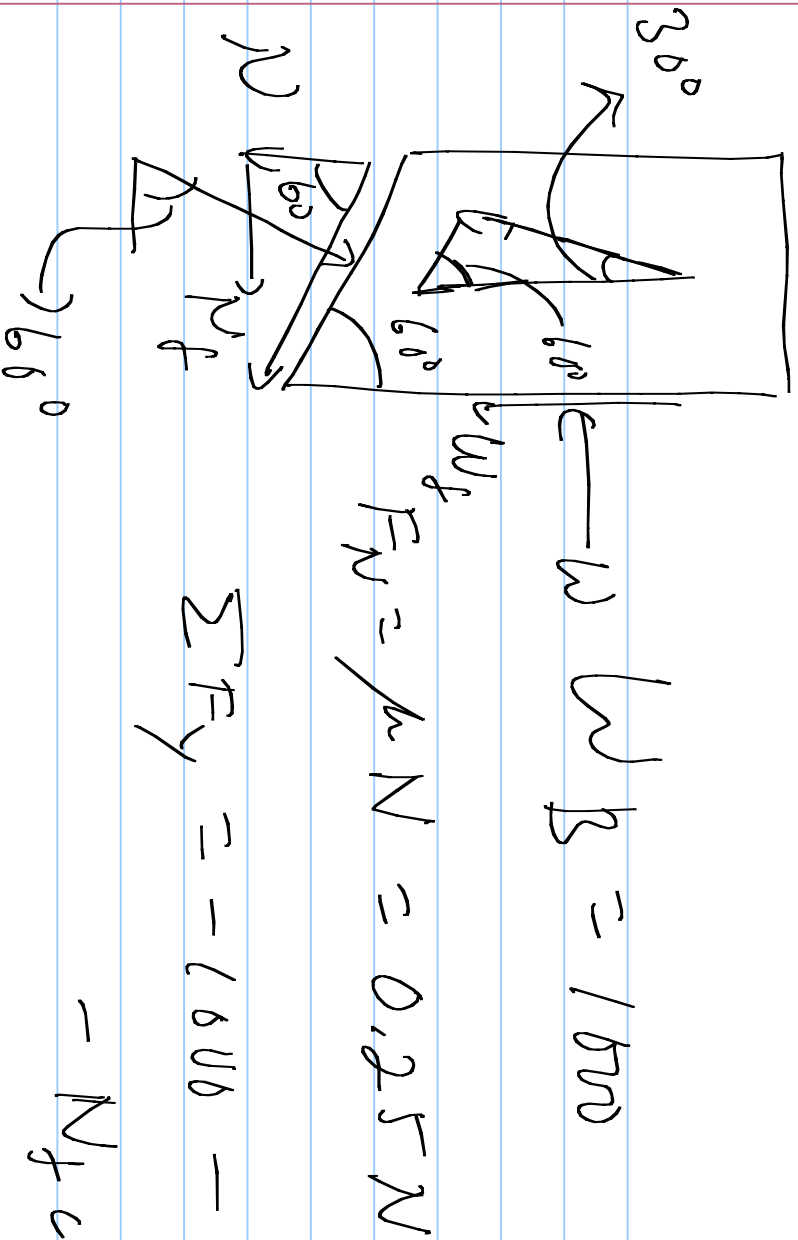
$w_B = 1000 \text{ lb}$

$w_A = 500 \text{ lb}$

$\mu = 0.10$

$\mu = 0.25$

$\mu = 0.10$



$$F_N = \mu N = 0.25 N$$

$$\Sigma F_y = -1500 - W_f + N \sin(60)$$

$$- N_f \cos(60) = 0$$

$$W_f = N \sin(60) - N_f \cos(60) - 1500$$

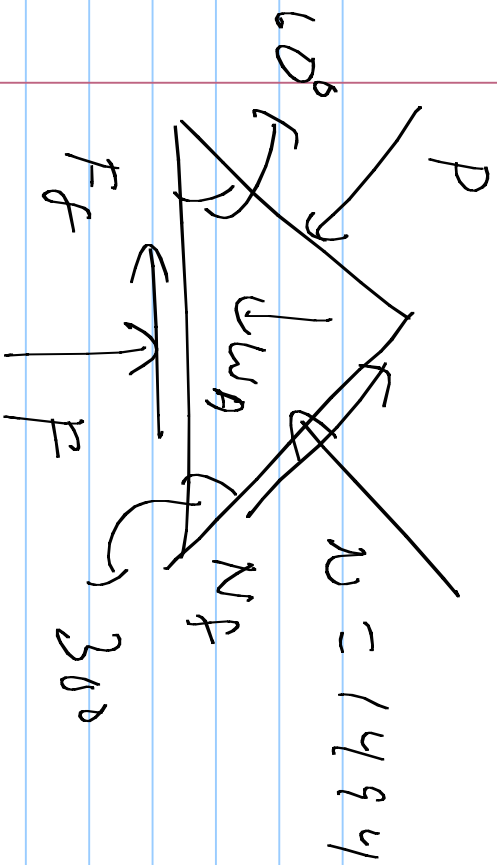
$$\Sigma F_x = -W + N_f \sin(60) + N \cos(60) = 0$$

$$W = N (\cos(60) + \mu \sin(60))$$

$$0.1N[\cos 60 + .25 \sin 60] = N[\sin 60 - .25 \cos 60] - 1000$$

$$1000 = N[\sin 60 - .25 \cos 60 - .1 \cos 60 - .025 \sin 60]$$
$$= N[.975 \sin 60 - .35 \cos 60]$$

$$N = \frac{1000}{.975 \sin 60 - .35 \cos 60} = 1499 \text{ lbs}$$



$$\sum F_y = -N \sin 60 - 500 + N_f \cos 60 + F$$

$$-P \cos 60 = 0$$

$$\cdot 1 (F - P \cos 60 = 500 + N \sin 60$$

$$\sum F_x = -F_f + P \sin 60 - N \cos 60 - N_f \sin 60 = 0$$

$$-0.1 F + P \sin 60 = N \cos 60 + N_f \sin 60$$

$$P (\sin 60 - 0.1 \cos 60) = 500 + 0.1 N \sin 60 - 0.1 N_f \cos 60 + N \cos 60 + N_f \sin 60$$

$$P = \frac{50}{\sin 60 - .120(160)} + N \left[\frac{.38 \sin 60 + .975 \cos 60}{\sin 60 + .1 \cos 60} \right]$$

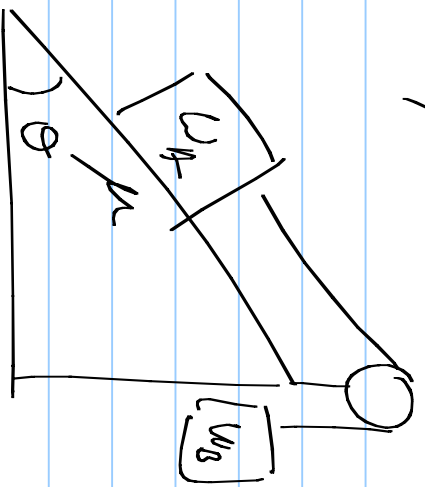
$$= 1509 \text{ lbs}$$

9-23) $\mu_L = 0.10$ $r = 0.375''$ $w = 2 \text{ lbs}$

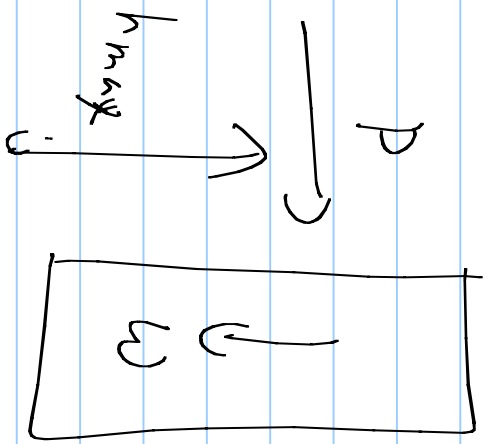
② $M = \mu_L L r = (0.1)(1)(.375)$
 $= .0375 \text{ in-lbs}$

↓
 115 lbs $M = .075 \text{ in-lbs}$

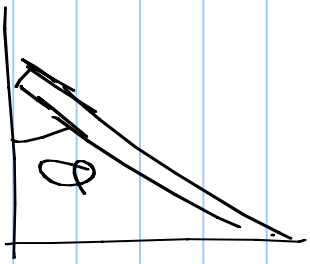
Dry Friction

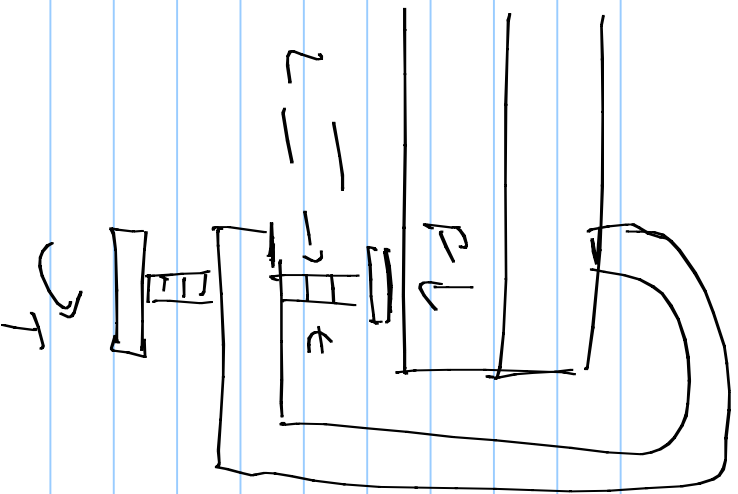


$W_B \leftarrow \mu \text{ in } \delta \text{ max}$



Wedge, Square Threaded screws,
Journal Bearings, Flat Belt





$$F = 100 \text{ lbs}$$

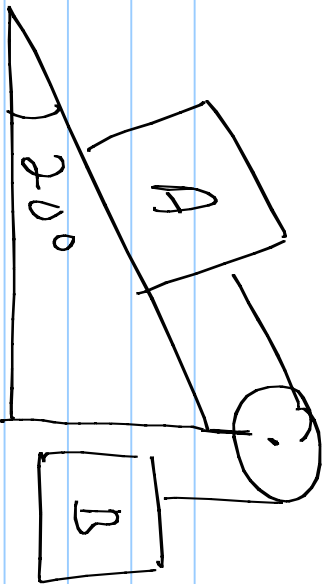
$$D = 0.5 \text{ ''}$$

$$L = 0.1 \text{ ''}$$

$$\mu = 0.4$$

$$T = \frac{Fr[L + 2\pi r \mu]}{2\pi r - \mu L} = \frac{(100)(.25)[.1 + .2\pi]}{.5\pi - .04}$$

$$= 11.9 \text{ in-lbs}$$



$$\mu = 0.3$$

$$W_A = 1000 \text{ lbs}$$

$$\sum F_N = -1000 \cos(20^\circ) + N = 0$$

$$N = 1000 \cos(20^\circ)$$

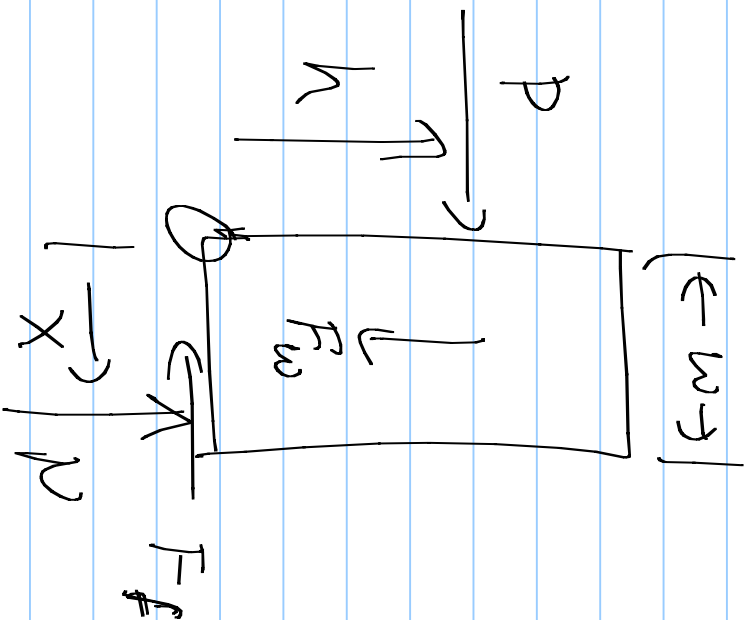
$$\sum F_T = -N_f + W_B - 1000 \sin(20^\circ)$$

$$W_B = 1000 \sin(20^\circ) + N_f = 0$$

$$= 1000 [\sin(20^\circ) + 0.3 \cos(20^\circ)]$$

$$W_{B \max} = 624 \text{ lbs}$$

$$W_{B \min} = 1500 \left[0.2(20) - 0.3 \cos(20) \right] = 60 \text{ lbs}$$



$x < w$ slides

$x > w$ tip over