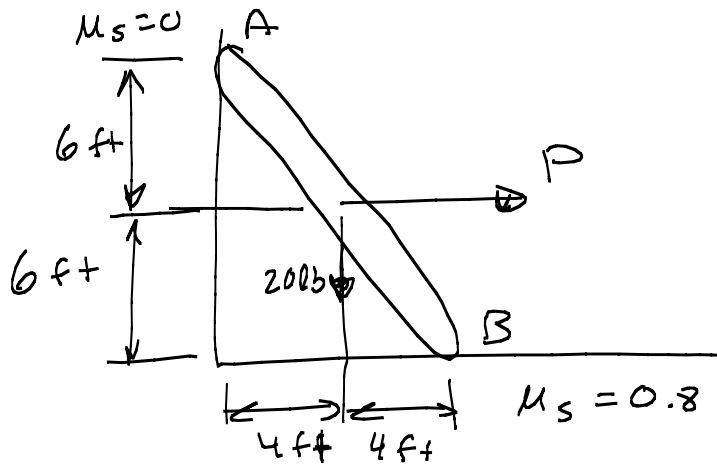


Problem 2

Determine:

P for impending motion



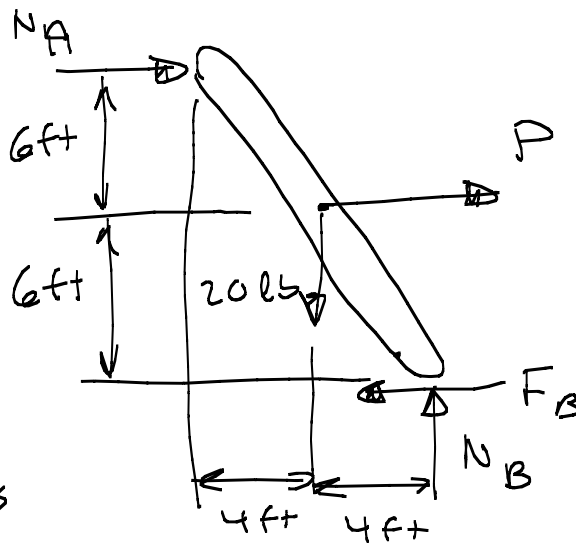
Un Knowns

N_A, F_B, N_B, P (4)

Equil. (3)

Friction (1)

Impending at all points



Assume Tipping

$$\text{Set } N_A = 0$$

$$+\uparrow \sum F_y = 0 \Rightarrow N_B = 20 \text{ lb}$$

$$+\circlearrowleft M_B = 0 \Rightarrow (20 \text{ lb})(4 \text{ ft}) - (P)(6 \text{ ft}) = 0$$
$$P = 13.33 \text{ lb}$$

$$\rightarrow \sum F_x = 0 \Rightarrow P - F_B = 0$$
$$F_B = 13.33 \text{ lb}$$

Check

$$F_B \stackrel{?}{<} \mu_s N_B$$

$$13.33 \text{ lb} \stackrel{?}{<} (0.8)(20 \text{ lb})$$

$$13.33 \text{ lb} < 16 \text{ lb} \quad \text{Tipping Occurs}$$

$$P = 13.33 \text{ lb}$$