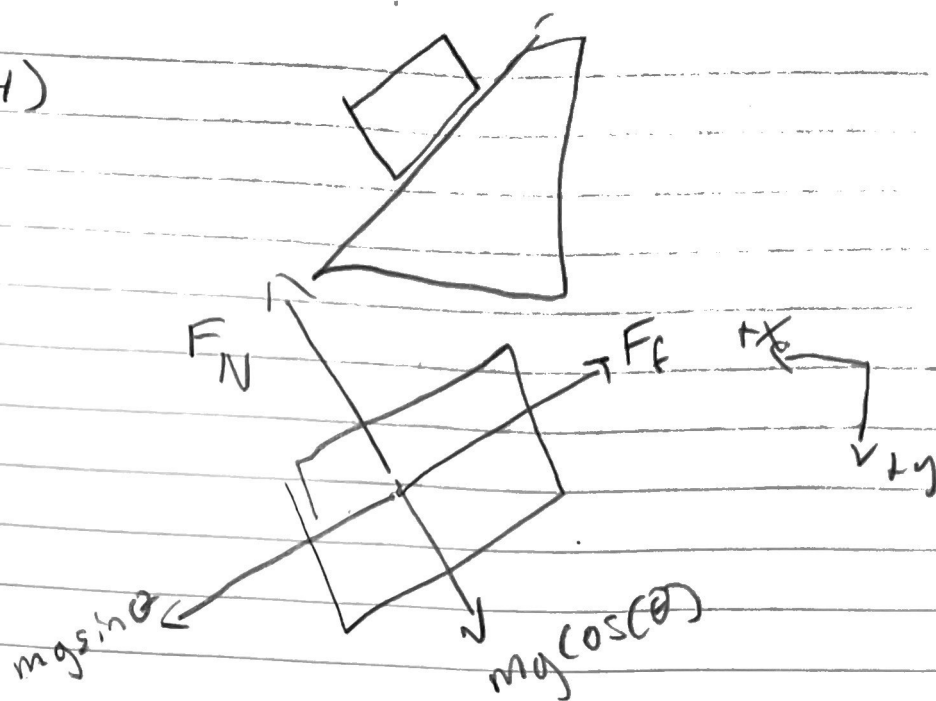


14)



$$m = 1.8 \cdot 10^7 \text{ kg}$$

$$g = 9.8 \text{ m/s}^2$$

$$\theta = 24^\circ$$

$$\mu_s = 0.63$$

a)

$$F_g = mg \sin(\theta)$$

$$F_g = (1.8 \times 10^7) (9.8) \sin(24^\circ)$$

$$= 7.1 \times 10^6 \text{ N}$$

friction

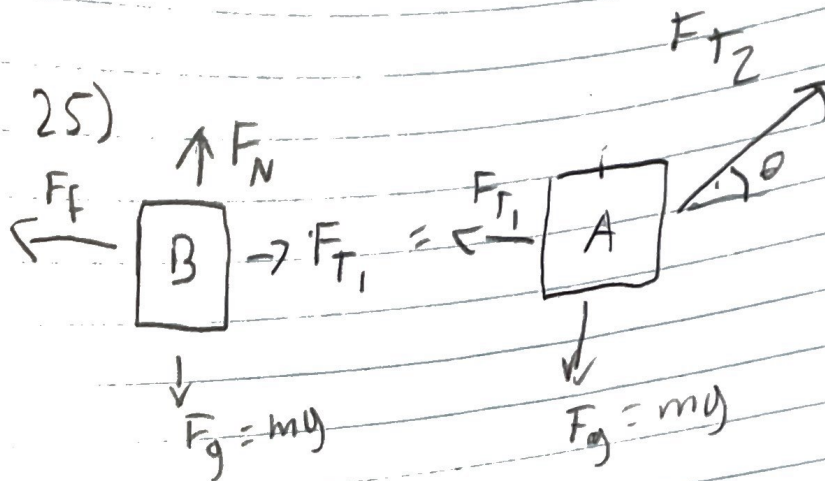
$$F_f = \mu F_N$$

$$= (1.8 \cdot 10^7) \cdot 0.63 \cdot \cos(24^\circ) \cdot 9.8$$

$$= 9.72 \times 10^6 \text{ N}$$

Since  $F_f > F_g$ , the block won't slide.

b)  $F_f = 9.7 \cdot 10^6 \text{ N}$  is required



$$B_{\text{mass}} = 711 \text{ N} \quad \mu = 0.25$$

$$\theta = 30^\circ$$

$$B_{\text{mass}} = F_N$$

$$T_2 \cos \theta - T_1 = 0$$

$$T_1 = T_1$$

$$T_2 \cos \theta = T_1$$

$$A_{\text{mass}} = T_2 \sin \theta$$

$$A = T_2 \sin \theta$$

$$A = T_1 \tan \theta$$

$$A = \mu F_N \tan \theta$$

$$A = \mu B \tan \theta$$

$$A = 0.25 (711 \text{ N}) \tan(30^\circ)$$

$$= 102.62 \text{ N}$$