

Pb 2 - part 2

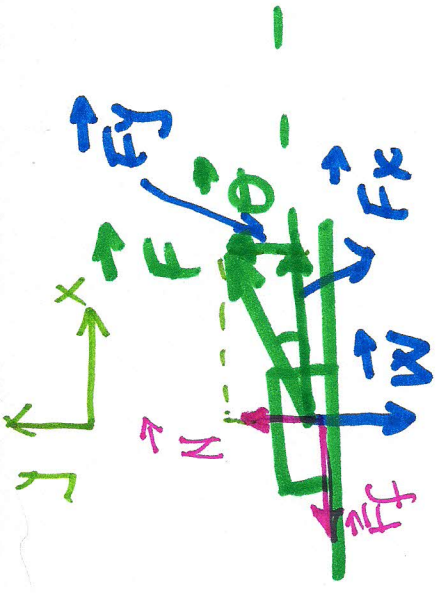
$$m = 50 \text{ kg}$$

$$\mu_s = 0.05$$

$$\mu_d = 0.03$$

$$\theta = 25^\circ$$

$$F = ?$$



On y direction equilibrium condition

$$N + F_y = W$$

$$N + F \cdot \sin \theta = m \cdot g \quad (*) \rightarrow N$$

On x direction:

$$F_x = f_f$$

$$F \cdot \cos \theta = \mu_d \cdot N \quad (**)$$

$$(*) \Rightarrow N = \frac{m \cdot g}{1 - \sin \theta} - F \cdot \sin \theta$$

$$(**) \quad F \cdot \cos \theta = \mu_d \cdot (m \cdot g - F \cdot \sin \theta)$$

$$F \cdot \cos \theta = \mu_d \cdot m \cdot g - \mu_d \cdot F \cdot \sin \theta$$

$$F (\cos \theta + \mu_d \cdot \sin \theta) = \mu_d \cdot m \cdot g$$

$$F = \frac{\mu_d \cdot m \cdot g}{\cos \theta + \mu_d \cdot \sin \theta} = \frac{\mu_d \cdot m \cdot g}{\cos \theta + \mu_d \cdot \sin \theta}$$