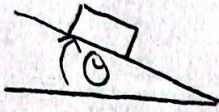


Problem: Display "Not sliding" and "sliding" for each  $\theta$  value between  $0^\circ$  and  $80^\circ$

Sketch:



Known Variables / Input:

Known mass = 24 kg

$\theta = 0^\circ - 80^\circ$

assuming  $g = 9.81 \text{ m/s}^2$

$\mu_s = .37$

Unknown Variables / Output

:  $F_N$  = Force Normal

Status of sliding vs static friction

Other Variables / Assumption:

we already know that values  $0^\circ - 20^\circ$  shouldn't be sliding.

Algorithm:

Force N:  $mg$ ,  $F_y: mg \cdot \sin \theta$

$F_x: mg \cdot \cos \theta \cdot \mu_s$

Implementation:

Matching sliding / not sliding status

= IF ( $F_y \geq F_x$ , "sliding", "not sliding")

= Index(A:A, MATCH("sliding", C:C, 0))

Test Case:

Mass  $M = 24 \text{ kg}$ , assuming earth:  $9.81 \text{ m/s}^2$

$\mu_s = .37$

the block should not be sliding under  $20^\circ$   
so  $21^\circ$  is when it starts sliding.