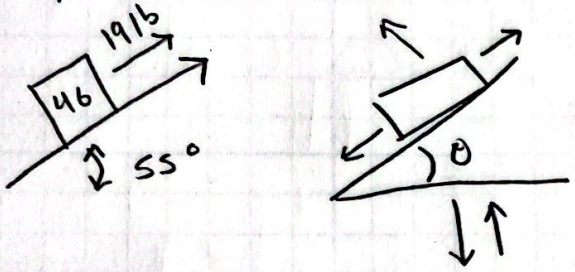
| 3-9-1 | 11/16/22 | Isaac Abella |
|---|---|---|

Problem) A 46 Pound box is being held by a 19 lb force on a 55° incline

A) What is the friction force?

B) What is the minimum required coefficient to allow the box not to slip?

Represent




Organize:

$W = 46lb$

$T_F = 19lb$

$\theta = 55°$

$F_f = ?$, Friction?

Solution

A) Friction Force $= \mu N$

$F_F = \mu_s (W \cos\theta)$

$19 - 46 \cos\theta = 18.68 lb$

B) $$\frac{F_F}{\mu_s N} = \frac{18.68}{46 \cos 55} = .707$$

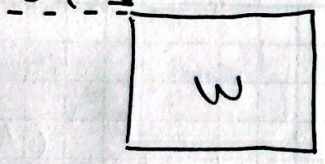
| 3-9-2 | 11/16/22 | Isaac Abella |
|---|---|---|

Problem) A) what is the minimum push force required to move the block

B) The block is moving and is still being pushed with the force found in part A, what's the magnitude of $F_f$

C) The block is still being pushed with the force found in part A, what is the magnitude of acceleration?

Represent:)




Organize

$P = ?$

$\theta = 33°$

$W = 42lb$

$\mu_s = .57$

$\mu_k = .44$

Solution)

A) $M_{pforce} = F_N - P\cos\theta = 0$

$F_N - P\sin\theta = W$

matrix solver:

$\cos 33, .57, 0$

$\sin 33, 1, 42$ $= \boxed{45.32lb}$

B)

$\mu_k \cdot (W + M_{pForce}\sin\theta)$

$= .44 \cdot 42 + 45.32\sin 33 = \boxed{29.34lb}$

C) Acceleration $= F = ma_x$

$F = \frac{42}{32.2} = 45.32\cos 33 = \frac{40}{32.2}$

$\boxed{= 6.69\ ft/s^2}$

| 3-9-3 | 11/16/22 | Isaac Abellc. |
|---|---|---|

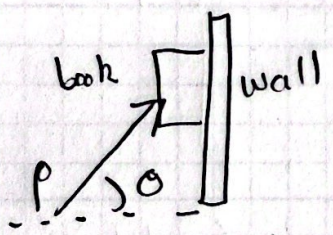
Problem) A) If the wall were frictionless, what magnitude of P would be needed to keep the book from slipping

B) What's the magnitude of Normal force if given P = 149N

C) What is force of friction on the book if given P = 149 N

D) What is the Pmax that can be applied on the book?

Represent)




Organize: book = 14.8 kg.

$\theta = 70^\circ$

$\mu_k = .56$.

A) $14.8 \cdot 9.81 \;/\; \sin 70 = 154.5\ N$.

B) $149 \cos 70 = 50.96\ N$.

C) $149 \cos(70) \cdot .56 = 28.5\ N$.

D) $P = \dfrac{14.8 \cdot 9.81}{(\sin 70) \cdot .44 \cos(70)} = 194.05\ N$