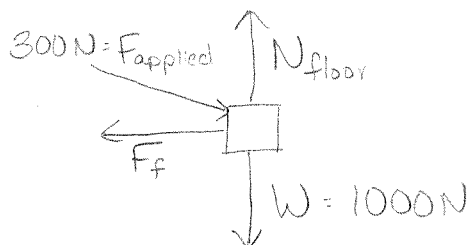
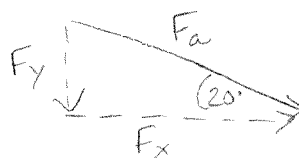


$W = 1000 \text{ N}$
 $F = 300 \text{ N}$
 $\theta = 20^\circ$ below x-axis
 $a = 0 \text{ m/s}^2$
 $\mu_k = ?$



Break $F_A = 300 \text{ N}$ into components



$$F_y = F_A \cdot \sin \theta$$

$$= 300 \text{ N} \cdot \sin 20$$

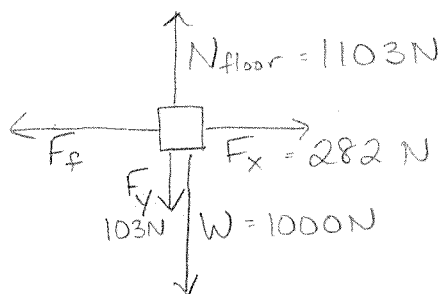
$$F_y = 103 \text{ N}$$

SO...

$$F_x = F_A \cdot \cos \theta$$

$$= 300 \text{ N} \cdot \cos 20$$

$$F_x = 282 \text{ N}$$



Downward force on the crate is:

$$F_y + W = 103 \text{ N} + 1000 \text{ N} = 1103 \text{ N}$$

$$F_y + W = N_{\text{floor}} = 1103 \text{ N}$$

Friction equals x component of F_A : $F_f = F_x = 282 \text{ N}$

$$F_f = \mu_k \cdot N$$

$$F_f = 282 \text{ N}$$

$$N = 1103 \text{ N}$$

$$(282 \text{ N}) = \mu_k \cdot (1103 \text{ N})$$

$$\mu_k = .256$$

P # 37b

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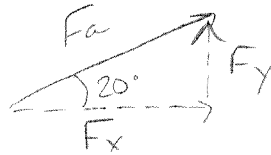
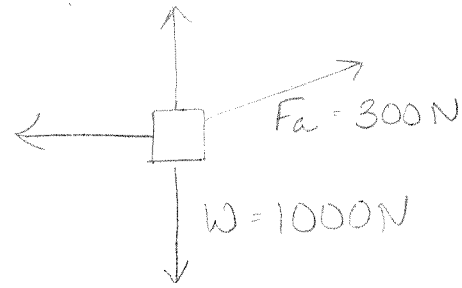
$$\begin{aligned}m &= 102 \text{ kg} \\W &= 1000 \text{ N} \\F &= 300 \text{ N} \\ \theta &= 20^\circ \text{ above x-axis} \\ \mu_k &= .256\end{aligned}$$

$$a = ?$$

Break F_A into components:

$$F_A = 300 \text{ N}$$

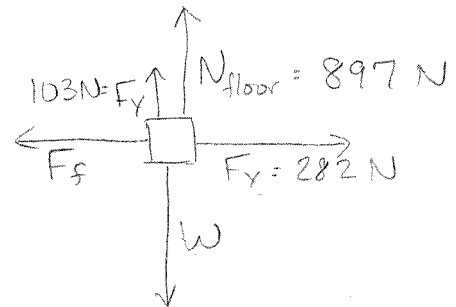
$$\begin{aligned}\text{From part a)} \quad F_y &= 103 \text{ N} \\ F_x &= 282 \text{ N}\end{aligned}$$



Downward force on the crate is:

$$\begin{aligned}W - F_y &= 1000 \text{ N} - 103 \text{ N} \\ &= 897 \text{ N}\end{aligned}$$

$$W - F_y = N = 897 \text{ N}$$



Force of friction on the crate is:

$$\begin{aligned}F_f &= \mu_k \cdot N \\ &= (.256)(897 \text{ N})\end{aligned}$$

$$F_f = 230 \text{ N}$$

Net force on the crate:

$$\Sigma F = F_y - F_f = m \cdot a$$

$$282 \text{ N} - 230 \text{ N} = (102 \text{ kg}) \cdot a$$

$$\boxed{a = .51 \text{ m/s}^2}$$