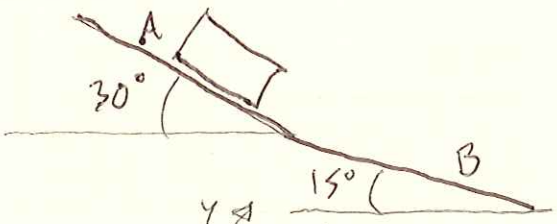
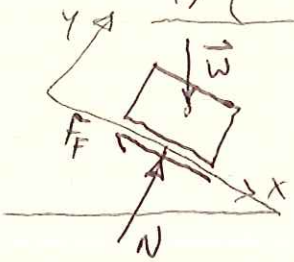
PROB. 12-10



$a_A = 3 \frac{m}{s^2}$, $\mu_A = \mu_B$

FIND a_B

POINT A:



$\vec{W} = (mg \cdot \sin 30^\circ)\hat{i} + (-mg\cos 30)\hat{j}$

$\vec{F}_F = (-\mu N)\hat{i}$; $\vec{N} = (N)\hat{j}$

$\Sigma F_y = ma_y$:

$-mg \cdot \cos 30^\circ + N = 0 \Rightarrow N = mg \cdot \cos 30^\circ$

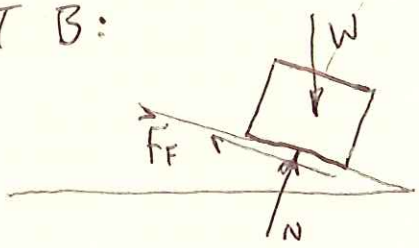
$\Sigma F_x = ma_x$

$mg \cdot \sin 30^\circ - \mu_k N = ma_A$

$mg \cdot \sin 30^\circ - \mu_A \cdot mg \cos 30^\circ = ma_A$

$$\mu_A = \frac{g \cdot \sin 30^\circ - a_A}{g \cdot \cos 30^\circ} = \frac{(9.81 \frac{m}{s^2}) \cdot \sin 30^\circ - (3 \frac{m}{s^2})}{(9.81 \frac{m}{s^2}) \cdot \cos 30^\circ} = 0.2242$$

POINT B:



$\vec{W} = (mg \cdot \sin 15^\circ)\hat{i} + (-mg \cdot \cos 15^\circ)\hat{j}$

$\vec{F}_F = (-\mu N)\hat{i}$; $\vec{N} = (N)\hat{j}$

$\Sigma F_y = ma_y$: $-mg\cos 15^\circ + N = 0 \Rightarrow N = mg \cdot \cos 15^\circ$

$\Sigma F_x = ma_x$: $mg \cdot \sin 15^\circ - \mu N = ma_B$

$mg \cdot \sin 15^\circ - \mu mg \cdot \cos 15^\circ = ma_B$

$$a_B = g(\sin 15^\circ - \mu \cos 15^\circ) = (9.81 \frac{m}{s^2})[\sin 15^\circ - (0.2242)\cos 15^\circ]$$

$$= 0.4145 \frac{m}{s^2}$$