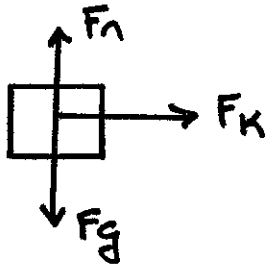
Physics Ch 4
P. 139 #1-3

1) Given:



$F_K = 53\ N$
$m = 24\ kg$
$g = 9.81\ m/s^2$

Find: $\mu_K = ?$

Soln:

$$F_K = \mu_K F_n$$

$$F_K = \mu_K mg \qquad F_n = mg$$

$$\mu_K = \frac{F_K}{mg}$$

$$= \frac{53\ N}{(24\ kg)(9.81\ m/s^2}$$

$$\boxed{\mu_K = .23}$$

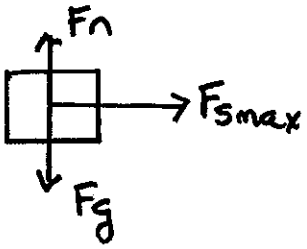
Physics Ch 4
P. 139 #1-3

2) Given:

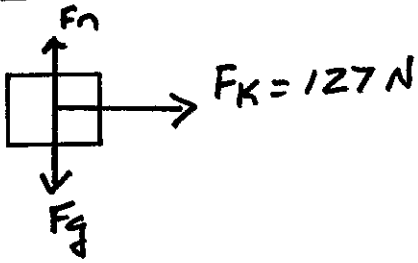
$F_{smax} = 165\,N$

$m = 25\,kg$

Part A



Part B



Find: A) $\mu_s = ?$

B) $\mu_K = ?$

Soln: A)

$$F_{smax} = \mu_s F_n$$

$$F_n = mg$$

$$F_{smax} = \mu_s mg$$

$$\mu_s = \frac{F_{smax}}{mg} = \frac{165\,N}{(25\,kg)(9.81\,m/s^2)}$$

$$\boxed{\mu_s = .67}$$

B) $F_K = \mu_K F_n$

$$F_n = mg$$

$$F_K = \mu_K mg$$

$$\mu_K = \frac{F_K}{mg} = \frac{127\,N}{(25\,kg)(9.81\,m/s^2)}$$

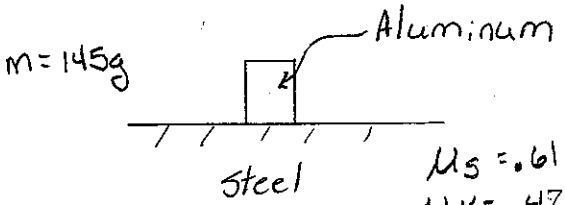
$$\boxed{\mu_K = .52}$$

Physics Ch4
P. 139 #1-3

3)

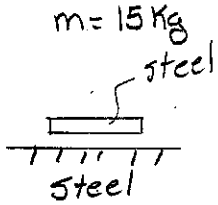
Given:

Part A



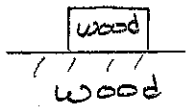
$\mu_S = .61$
$\mu_K = .47$

Part B



$\mu_S = .74$
$\mu_K = .57$

Part C

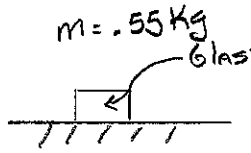


$\mu_S = .4$
$\mu_K = .2$

Find:

F_{SMAX} & F_K for each situation

Part D



$\mu_S = .9$
$\mu_K = .4$

Soln:

$$\mu_S = \frac{F_{SMAX}}{F_n} \qquad \mu_K = \frac{F_K}{F_n}$$

$$F_{SMAX} = \mu_S F_n \qquad F_K = \mu_K F_n$$

Part A

$F_{SMAX} = (.61)(145Kg)(9.81 m/s^2)$

$\boxed{F_{SMAX} = 870 N}$

$F_K = (.47)(145Kg)(9.81 m/s^2)$

$\boxed{F_K = 670 N}$

Part B

$F_{SMAX} = (.74)(15Kg)(9.81 m/s^2)$

$\boxed{F_{SMAX} = 110 N}$

$F_K = (.57)(15Kg)(9.81 m/s^2)$

$\boxed{F_K = 84 N}$

Part C

$F_{SMAX} = (.4)(250Kg)(9.81 m/s^2)$

$\boxed{F_{SMAX} = 1000 N}$

$F_K = (.2)(250Kg)(9.81 m/s^2)$

$\boxed{F_K = 500 N}$

Part D

$F_{SMAX} = (.9)(.55Kg)(9.81 m/s^2)$

$\boxed{F_{SMAX} = 5 N}$

$F_K = (.4)(.55Kg)(9.81 m/s^2)$

$\boxed{F_K = 2 N}$