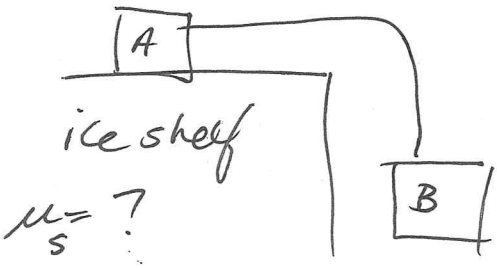
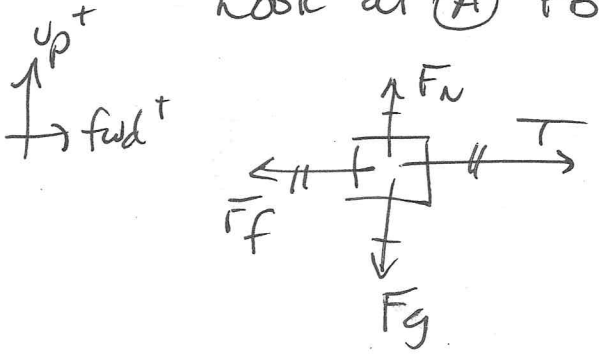
p. 178 #2

m = 55 kg



#'s
6
9
10

Look at (A) FBD



$$\mu_s = \frac{F_f}{F_N} = \frac{T}{F_g} = \frac{F_{gB}}{F_{gA}}$$

$$\mu_s = \frac{(78)(9.8)}{(55)(9.8)} = 1.42$$

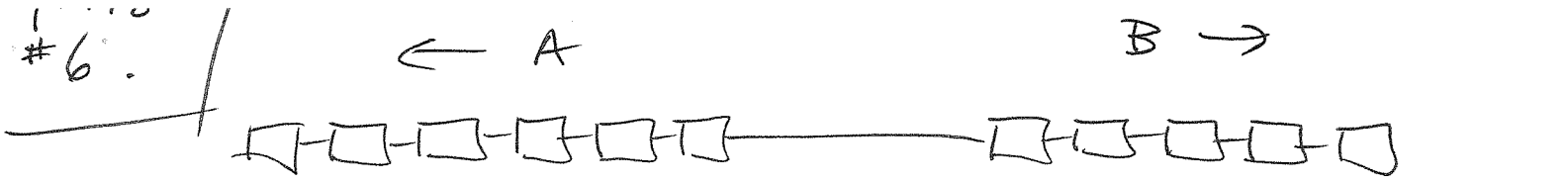
a) $\mu_s = 1.4$

b) Not reasonable #1 $\mu_s > 1.0$ which is uncommon

#2 It's ice! which has low μ_s

c) Reasonable? - Add grit, something to grab...

#6.



6 players @ $m = 65\,kg$

$\mu_s = ?$

$\mu_k = ?$

5 players @ $m = 84\,kg$

$F_B = 3200\,N$ to start

$F_B = 2900\,N$ to keep moving

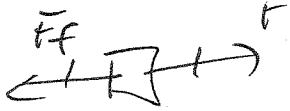
$\sqrt{}$ cant.

μ_s - start moving

$$\mu_s = \frac{F_f}{F_N} = \frac{F_B}{F_g} = \frac{3200}{(6\times65)(9.8)}$$

$$= 0.84$$

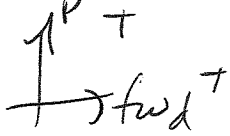
μ_k - keep moving

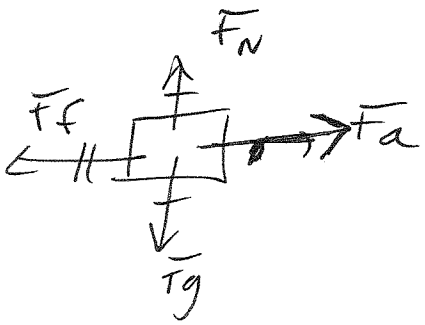


$$\mu_k = \frac{F_f}{F_N} = \frac{F_B}{F_g} = \frac{2900}{(6\times65)(9.8)}$$

$$= 0.76$$

p. 178
#9





$F_a \neq F_f$

$V_1 = 0$

$t = 2.0\ s$

$V_2 = 1.2\ m/s$

$m = 5.0\ kg$

$F_a = ?$

$\mu = 0.25$

$F_{net} = ma$

$F_a + F_f = ma$

$F_f = \mu F_N$

$a = \dfrac{V_2 - V_1}{t}$

$$a = \frac{V_2 - V_1}{t} = \frac{1.2 - 0}{2} = 0.6\ m/s^2\ [fwd]$$

$$F_f = \mu F_N = \mu F_g = (0.25)(15)(9.8) = 36.75N$$

$F_a + F_f = ma$

$F_a + (-36.75) = (15)(0.6)$

$F_a = 9 + 36.75 = 45.75$

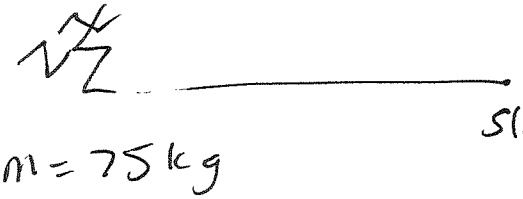
$F_a = 46\ N\ [fwd]$

p. 170
#10.

$V_1 = 2.8$ m/s [fwd]

$V_2 = 0$

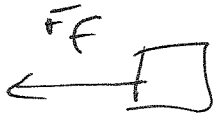
$\mu_k = ?$



$m = 75$ kg

$\Delta d = 3.8$ m

$\mu_k = \frac{F_f}{F_N} = \frac{F_f}{F_g}$ ✓ → only force acting on player



→ V_1

$F_{net} = ma$

$F_f = ma$

? ✓ (2)

$V_2^2 = V_1^2 + 2ad$

$V_2^2 = V_1^2 + 2ad$

$0 = (2.8)(2.8) + 2(3.8)a$

$a = -1.032$ m/s^2

$F_f = ma$

$= (75)(-1.032) = -77.37$ N [fwd]

← use absolute value here

$\mu_k = \frac{F_f}{F_N} = \frac{+77.37}{(75)(9.8)} = 0.105$

$(F_N = F_g)$

$\mu_k = 0.11$