P #58   Ch. 4 - pg 112
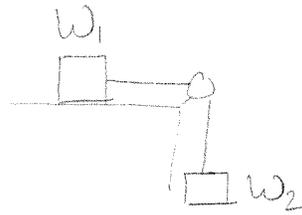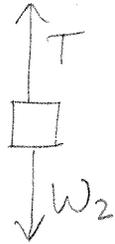
$a = 0 \, m/s^2$ (at rest)
$W_1 = 100 \, N$
$W_2 = 50.0 \, N$

$F_f = ?$
$N_s = ?$

a) For W_2:
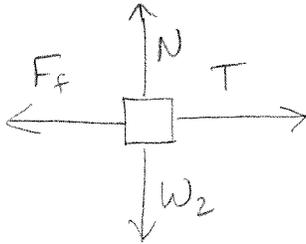

$F_{net} = W_2 - T = m_2 a$

if $a = 0 \, m/s^2$, $W_2 - T = m \cdot (0 \, m/s^2)$
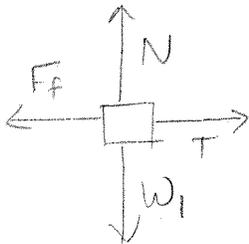 $W_2 - T = 0$

                       $T = W_2$

For W_1:

$F_{net} = T - F_f = m \cdot a$
      $T - F_f = m \cdot (0 \, m/s^2)$
        $T - F_f = 0$

      $F_f = T = W_2$ so $\boxed{F_f = 50.0 \, N}$
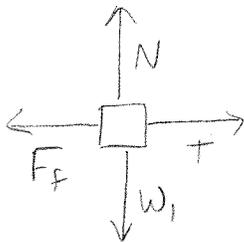
b) For W_1

$N = W_1 = 100 \, N$
$F_f = 50.0 \, N$

$F_f = N_s \cdot N$

$50.0 \, N = N_s \cdot (100 \, N)$ so $\boxed{N_s = .500}$

c) For W_1

$N = 100 \, N$
$N_k = .250$
$W_2 = ?$

From part a)... if $a = 0 \, m/s^2$ $F_f = T = W_2$

$F_f = N_k \cdot N = W_2$

$(.250)(100 \, N) = W_2$

$\boxed{W_2 = 25.0 \, N}$