Warm up

- A 10.0 kg box rests on a horizontal floor.
- The coefficient of static friction is 0.400, and the coefficient of dynamic friction is 0.300.
- Determine the maximum amount of static friction that will keep the box at rest.
- Determine the amount of force necessary to keep the box moving at a constant rate.

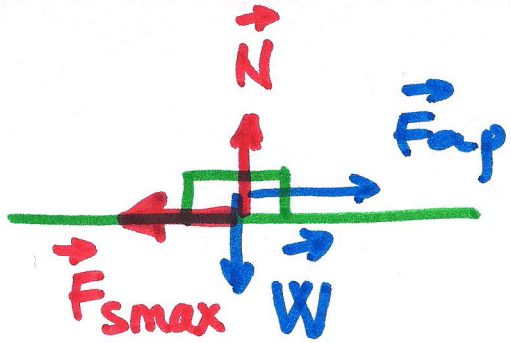
$m = 10\ Kg$

$\mu_s = 0.400$

$\mu_d = 0.300$

$F_{smax} = ?$

$F_d = ?$



No motion on vertical direction: (Equilibrium condition: $F_{NET_y} = 0$)

$N = W$

$N = W = m \cdot g = 10kg \cdot 9.8 m/s^2$

$N = W = 98.1 N$

$F_{smax} = \mu_s \cdot N$

$F_{smax} = 0.4 \times 98.1 N = 39.24\ N$

$F_d = \mu_d \cdot N = 0.3 \times 98.1 N = 29.43 N$