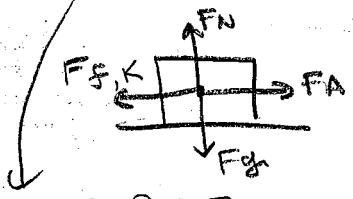
## Friction

1. Draw a free-body diagram and calculate the force of friction of a 20.0 kg **steel** block moving a **constant** speed on a **steel** level surface. (Hint use reference tables)

MASS

M = 20 kg
V = CONST.
$\Sigma a_x = 0$




$\mu_K = 0.57$

SINCE a = 0 → $F_{A} = F_f$

$F_{NET,x} = F_A + (-F_f) = ma$

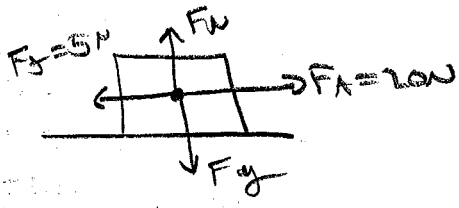
$F_A = F_f$

$F_A = F_{f,K} = \mu_K F_N = (.57)(196.2N) = 112N$

$F_N = F_g = mg = (9.81 m/s^2)(20 kg) = 196.2N$

2. A 10.0 kg box is being pulled to the right with a force of 20.0 N, while a frictional force 5.00 N acts on it.

A. Draw a free-body diagram of all the forces acting on the box.




B. What is the net force acting on the box? (give magnitude with direction)

$F_{NET} = F_A + F_f$
$= 20N + (-5N)$
$= 15N$

C. Calculate the acceleration of the box? (give magnitude with direction)

$a = \frac{F_{NET}}{m} = \frac{15N}{10 kg} = 1.5 m/s^2$

D. Calculate the coefficient of friction between the box and the floor.

$F_f = \mu F_N \rightarrow \mu = \frac{F_{f,K}}{F_N} = \frac{5N}{98.1N} = 0.0510$

$F_N = F_g = mg = (10kg)(9.81 m/s^2) = 98.1N$