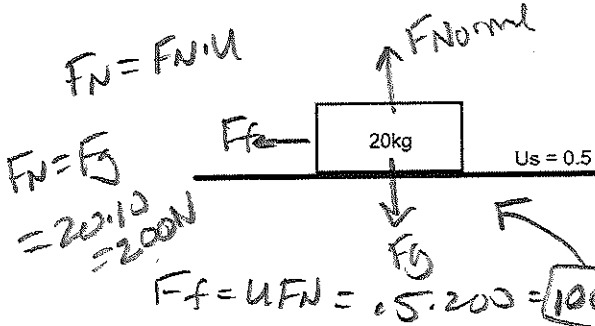


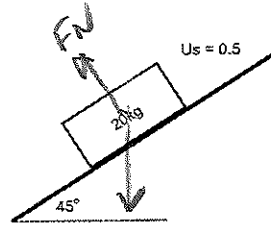
Practice For Proficiency
Friction Calculations

$F_R = \text{Force Ramp}$
 $F_g = 20 \cdot 10 = 200\text{N}$

1. Calculate the Force of friction on the following objects.



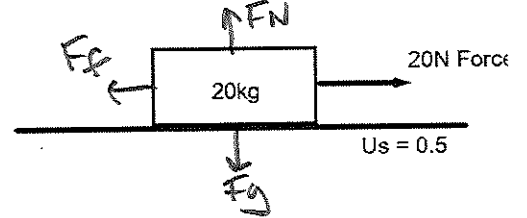
$F_f = U F_N = 0.5 \cdot 141 = 70.5\text{N}$



$\sin 45 \cdot 200 = 141\text{N}$
 $\cos 45 \cdot 200 = 141\text{N}$

2. Answer the following questions about the box to the right.

- Add all forces to the box to the right.
- Calculate net force on the box.
- Calculate the acceleration of the box.



3. A student wants to slide a steel 15kg mass across a steel table.

- How much force must a student apply to start the mass moving at a constant speed?

$F_f = U F_N = 0.25 \cdot 15 \cdot 10 = 37.5\text{N}$

- The box is being pulled at a constant velocity.

- What is the net force? $22 \cdot 150 = 33\text{N}$
- What is the force pulling the box?

4. Look at the blocks below.

- Draw all force vectors on the system?
- What is the net force on each block?

$F_{g\downarrow} = 25 \cdot 10 = 250\text{N}$
 $F_{g\uparrow} = 15 \cdot 10 = 150\text{N}$

- What is the acceleration of each block?

$F_{f\uparrow} = U F_N = 0.15 \cdot 150 = 22.5\text{N}$

$F_{f\uparrow} = F_{a\downarrow}$

$F_{f\downarrow} = 250 \cdot 0.5 = 125\text{N}$

$(125\text{N}) F_{f\downarrow} > F_{a\uparrow} (22.5\text{N}) \Rightarrow a_{\downarrow} = 0$

$a_{\uparrow} = \frac{30 - 22.5}{15} = 0.5\text{ m/s}^2 \uparrow \text{ top block}$

