

Forces $F=ma$ Force = mass \times acceleration

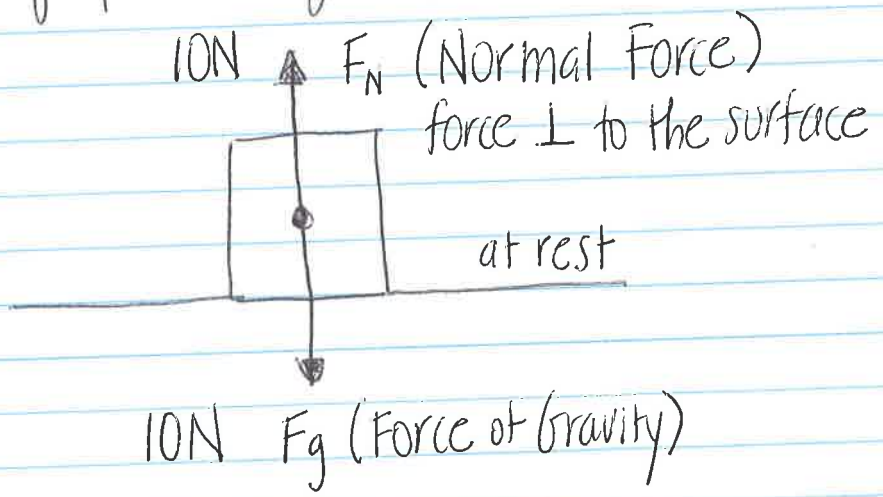
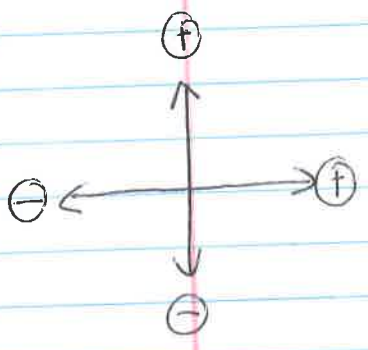
A net force is the sum of all the forces acting on an object.

$\sum F = 0N$ then the forces are balanced and in equilibrium
 \uparrow \uparrow
sum of forces all

$\vec{a} = 0 \frac{m}{s^2}$ Case #1 : Object is at rest.
Case #2 : Object is moving at constant velocity.
(same speed + direction)

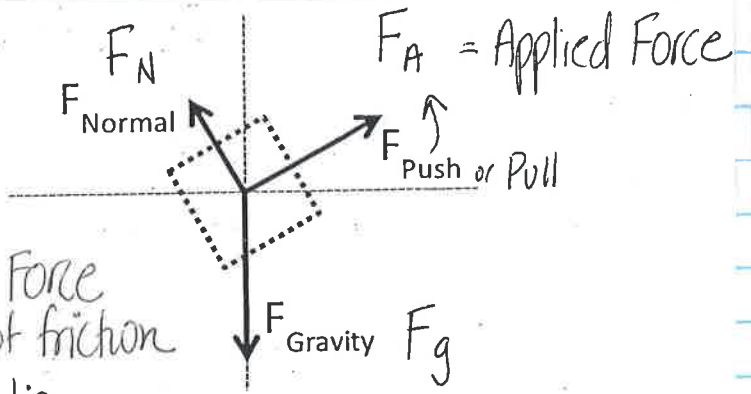
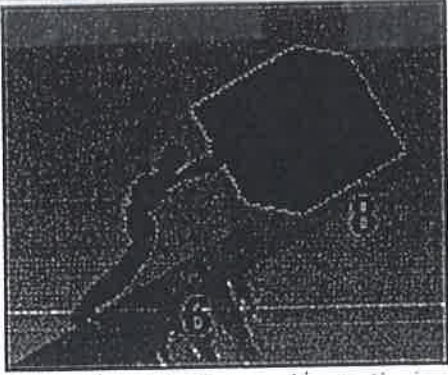
$\sum F \neq 0N$ then the forces are unbalanced and an object accelerates

Free Body Diagrams - shows all the forces acting upon a single object



$$\sum F = F_g + F_N = 0N$$

$$\sum F = -10N + 10N = 0N$$



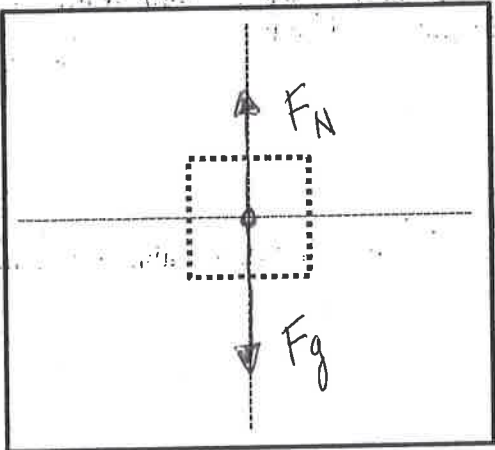
$F_f = \text{Force of friction}$

ice = no friction

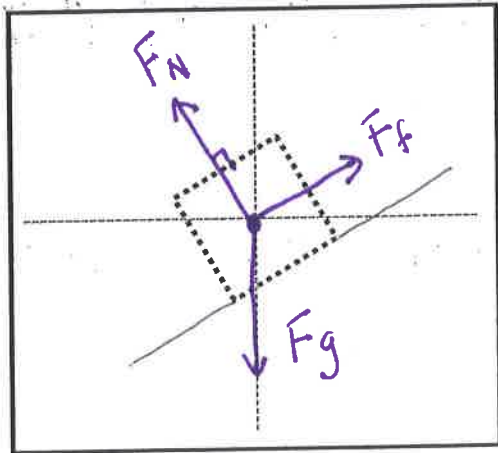
The Free Body Diagram must include:
 Object
 Arrows representing forces (originating from the center of gravity)
 Labels on the force arrows

Draw a Free Body Diagram for each of the following situations:

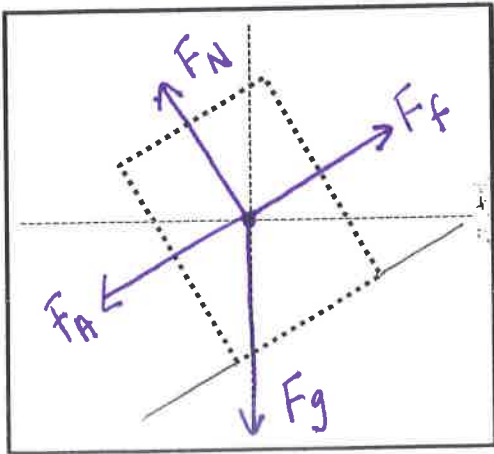
Crate Not Moving on Ice



Crate Not Moving on Wood Ramp



Fridge Pushed Down Wood Ramp



Fridge Pushed Up Ice Ramp

