

Name: _____

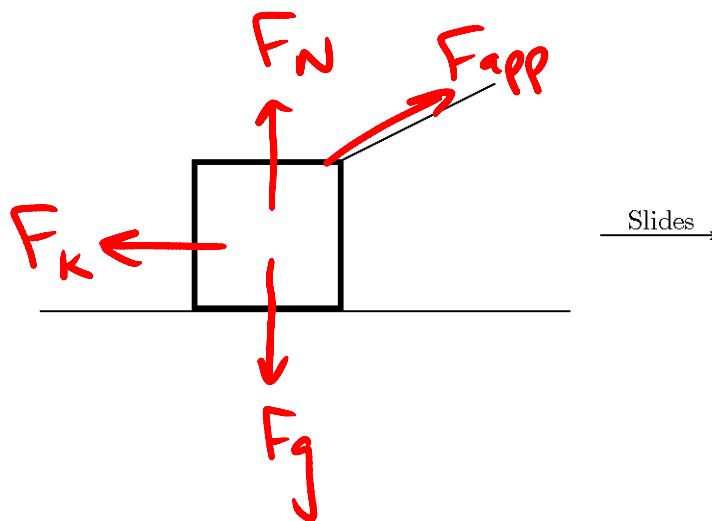
Date: _____

Section C D F

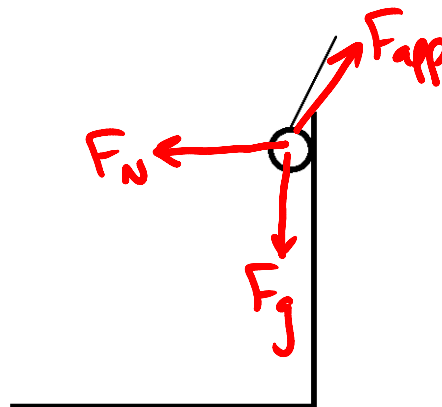
Free Body Diagrams

For each situation, draw a free body diagram depicting every force acting upon the object. Clearly note both what each force is and the direction of each force.

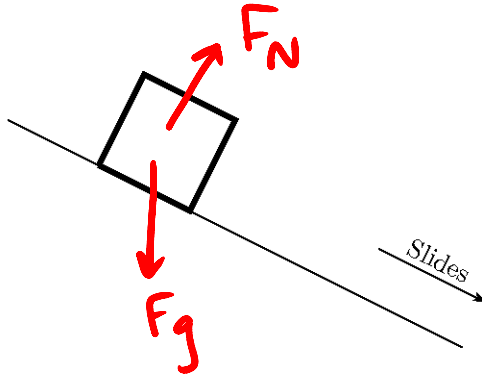
1. A crate is pulled across a horizontal floor by means of a rope attached to it.



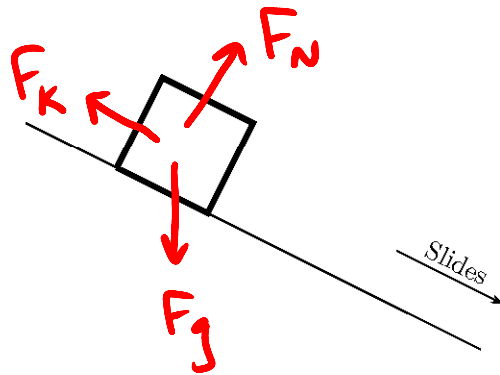
2. A ball hangs from a string and is touching the side of a frictionless wall.



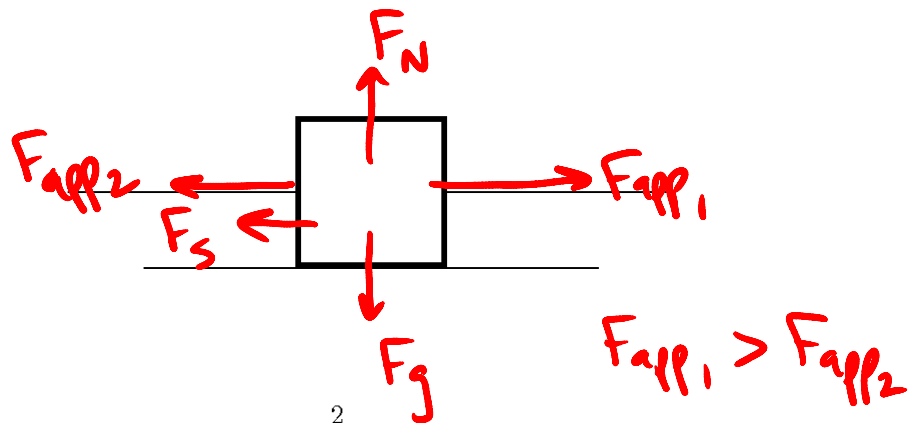
3. A block slides down a frictionless ramp.



4. A block slides down a ramp with friction.

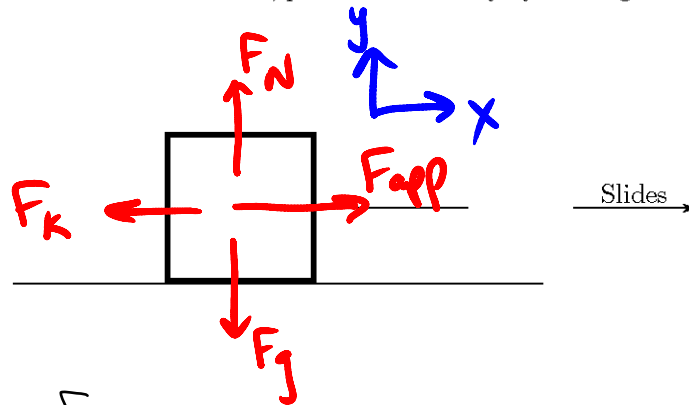


5. A crate is pulled by two opposing forces via ropes, the one from the right being the stronger of the two. It lies on a horizontal floor and remains at rest.



For each situation draw a free body diagram depicting every force acting on the object. Clearly note both what each force is and the direction of each force. Draw your choice of x and y axes and write the sum of the forces along each axis for each situation. You don't need to do any calculations with the net force.

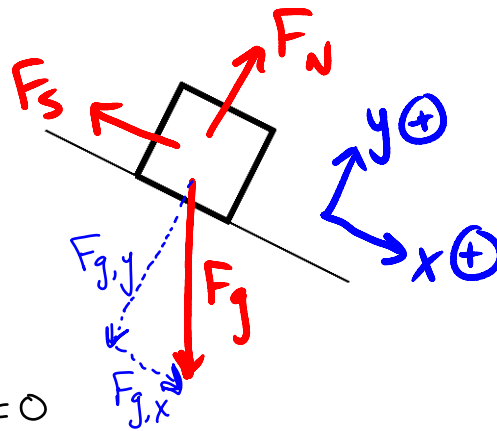
1. A block slides across a horizontal floor, pulled horizontally by a string attached to it.



$$F_{net\ x} = F_{app} - F_k$$

$$F_{net\ y} = F_N - F_g = 0$$

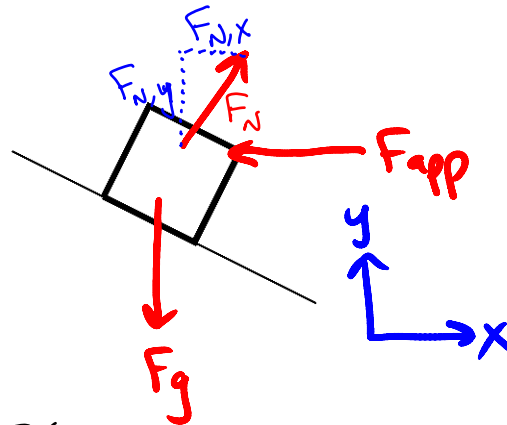
2. A block sits in place on a ramp.



$$F_{net\ x} = F_{g,x} - F_s = 0$$

$$F_{net\ y} = F_N - F_{g,y} = 0$$

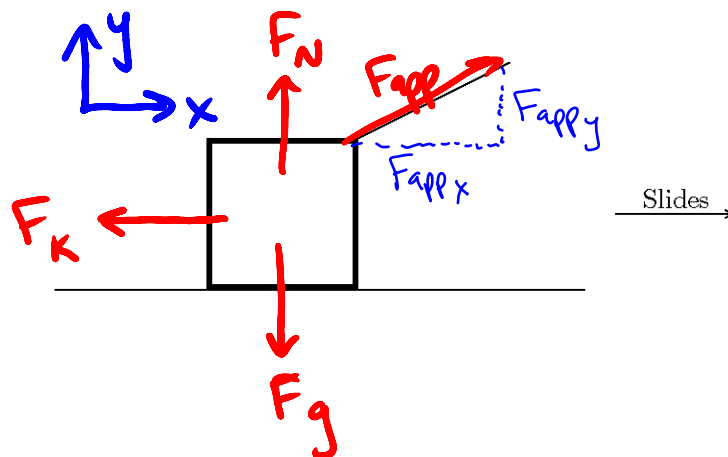
3. A block sits in place on a frictionless ramp, held there by a person pushing horizontally.



$$F_{net\ x} = F_{N,x} - F_{app} = 0$$

$$F_{net\ y} = F_{N,y} - F_g = 0$$

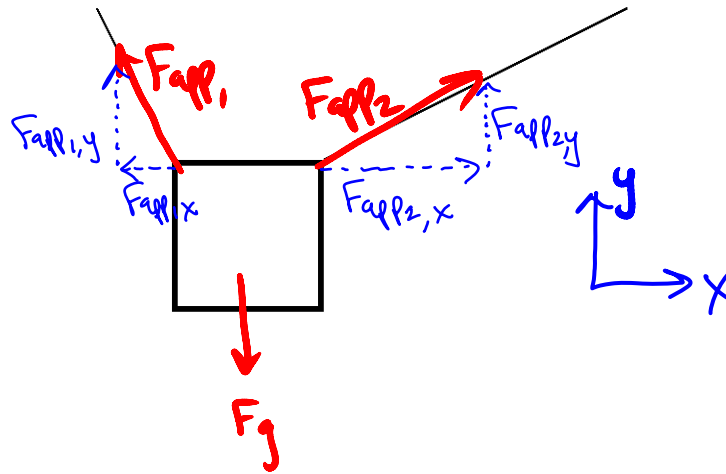
4. A crate is pulled across a horizontal floor by means of a rope attached to it.



$$F_{net\ x} = F_{app\ x} - F_k$$

$$F_{net\ y} = F_N + F_{app\ y} - F_g = 0$$

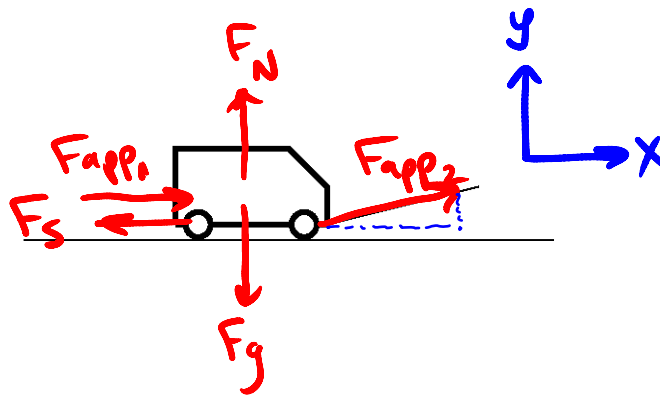
5. A painting is held up by two strings.



$$F_{net\ x} = F_{app2,x} - F_{app1,x} = 0$$

$$F_{net\ y} = F_{app1,y} + F_{app2,y} - F_g = 0$$

6. A car is stuck in the mud. To pull the van out of the mud a tow truck attaches a cable inclined above the horizontal to the van. Several people push horizontally from behind the van.



$$F_{net\ x} = F_{app1} + F_{app2,x} - F_S = 0$$

$$F_{net\ y} = F_N + F_{app2,y} - F_g = 0$$