ABRHS PHYSICS (CP) NAME: KEY

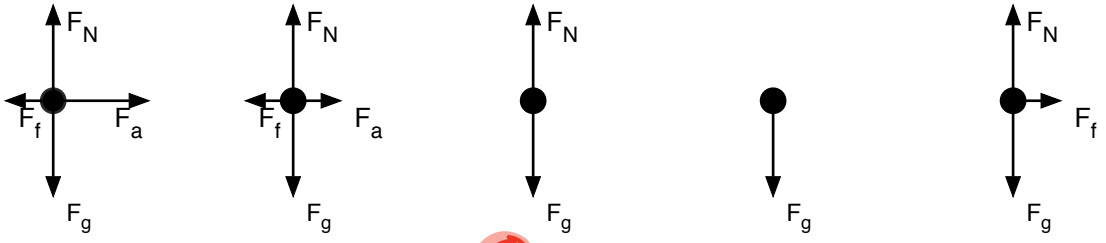
Newton's 1st Law Force Diagrams

A "Free-Body Diagram" is just a sketch showing all the forces acting on an object, but taking care to label the forces correctly and show the correct directions.

Common forces that may be present:

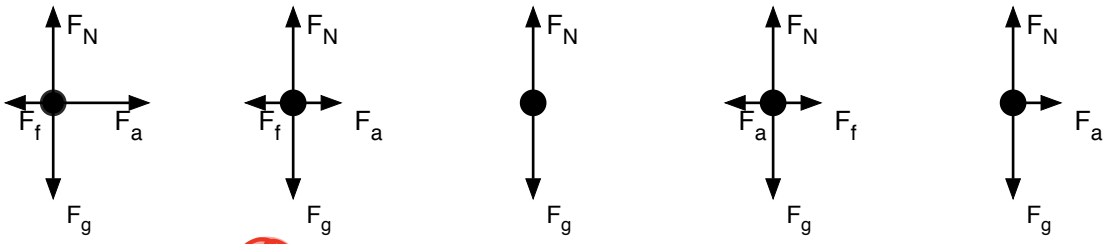
F_g – Force of gravity (weight)
F_T – Tension (force in a string or a cable)
F_N – Normal force (support force of the ground on an object)
F_f or F_{drag} – Force of friction or force of air drag
F_{lift} – Lift force of the propellers or wings of an airplane
F_a – Force applied to an object.

1. Which of the following would best represent a person standing still in the hallway?



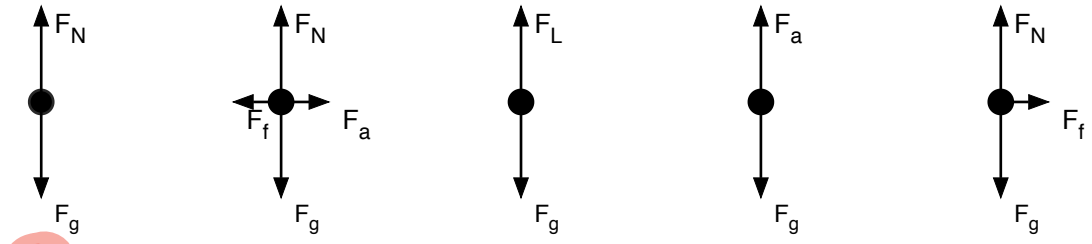
a. b. c. d. e.

2. Which of the following would best represent a person being pulled to the right at constant speed?



a. b. c. d. e.

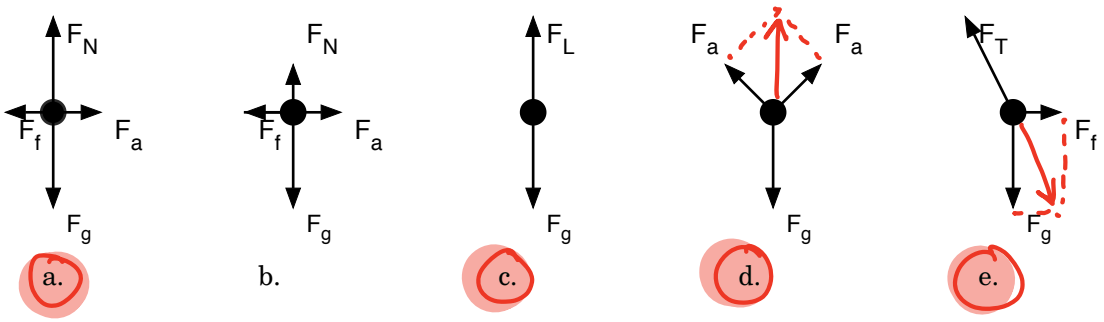
3. Which of the following would best represent a person standing still in an elevator?



a. b. c. d. e.

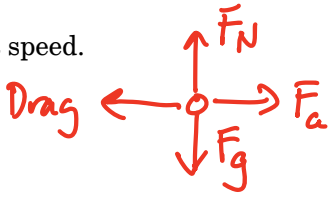
Newton's 1st Law Force Diagrams

4. Which of the following would show forces completely cancelling out? (Circle all that apply.)

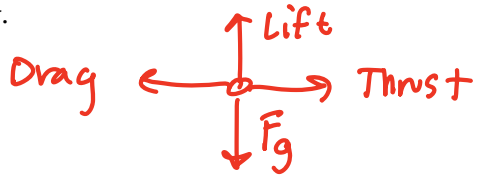


For each of the following, sketch a "Free Body Diagram," which is a labeled diagram of all the forces acting on the object.

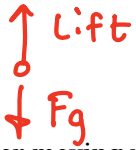
1. A car traveling to the right at a constant speed.



2. An airplane flying to the right at constant velocity.

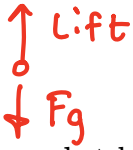


3. A helicopter hovering above the ground.

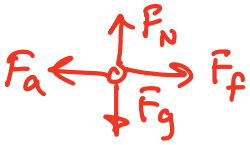


4. A person riding in an elevator moving up with constant speed.

5. A helicopter coming down at constant speed.



6. A student pushing a fellow student on a skateboard to the left at a constant speed.



7. What do all of those examples have in common? How does this relate to Newton's 1st Law?

All constant velocity → All forces canceled out.

Net Force = 0 in all cases.