

Quiz #4: Forces and Newton's Laws of Motion

Problem 1 (1.5 points)

A book at rest on the table has two forces on it: gravity pulling it down and the normal force pushing it up. Are these two forces an action/reaction pair?

- a) yes
- b) no

Problem 2 (1.5 points)

You throw a ball straight upward in the absence of air resistance. After you have released it, just before it reaches its maximum height, what force(s) are acting on the ball?

- a) Gravity (down)
- b) Gravity (down) and inertia (up)
- c) Gravity (down) and the force of the throw (up)
- d) Inertia (up)

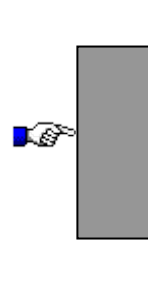
Problem 3 (4 points)

For each situation described below, draw a free-body diagram showing all of the forces acting on the object (as well as the net force)

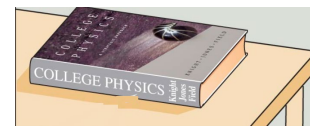
- a) A tow rope pulls a skier up a snow-covered 30° hill at a constant speed. Friction is present and air resistance is **not** negligible.



- b) You hold a picture motionless against a wall by pressing on it.



- c) Your physics textbook is sliding to the right across the table. Air resistance is negligible but friction is not.



Problem 4 (3 points)

A constant force is applied to an object, causing it to be accelerated at 5.0 m/s^2 . What will be the acceleration (in m/s^2) if:

- a) The force is halved?
- b) The force is tripled and the object's mass is doubled?
- c) The force is doubled and the object's mass is tripled?