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Quiz 4: Force - Solution

1. You are in a plane accelerating down a runway during takeoff, and you are holding a pendulum (say, a shoe hanging from a shoelace). The string of the pendulum:

- □ hangs straight downward
- □ hangs downward and forward, because the net force on the pendulum must be zero
- □ hangs downward and forward, because the net force must be nonzero
- □ hangs downward and backward, because the net force must be zero
- ■ hangs downward and backward, because the net force must be nonzero

2. Two people pull on opposite ends of a rope, each with force F. The tension in the rope is: *(Hint - would it change if one person were removed and that end of the string tied to a wall?)*

- □ $F/2$
- ■ F
- □ $2F$

3. The static friction force between a car's tires and the ground can do all of the following *except*:

- □ speed the car up
- □ slow the car down
- □ change the car's direction
- ■ it can do all of the above things

4. When you *stand at rest* on a floor, you exert a downward normal force on the floor. Does this force cause the earth to accelerate in the downward direction?

- □ Yes, but the earth is very massive, so you don't notice the motion
- □ Yes, but you accelerate along with the earth, so you don't notice the motion
- □ No, because the normal force isn't a real force
- ■ No, because you are also pulling on the earth gravitationally
- □ No, because there is also friction at your feet.