

Name_____

Force Diagrams

For each of the following situations, you will need to do the following:

- A. Draw a simple picture.
- B. Represent all of the forces acting in the situation with arrows.
- C. Label the appropriate forces.

Each question is worth three points. 1 point for having the correct forces, 1 point for having them correctly labeled, and 1 point for not putting in extra forces. Draw the force diagrams on the reverse of this page.

1. A 1500 N car that is parked on level ground.
2. A 75 N physics student that is suspended above the ground with a rope tied around his ankles.
3. A 30 N box of physics tests being dragged across frictionless ice with a rope which has a tension of 100 N.
4. A 5000 N glider (no engines) gliding through the air in which the force of friction (drag) caused by the air has a magnitude of 100 N.
5. A 3000 N truck parked on a hill that has a slope of 30° . A friction force of 1500 N is required to keep it from sliding down the hill.
6. A 25,000 N airplane flying at a constant speed. The thrust from the engines is 18,000 N, air friction (drag) is 18,000 N.
7. A 1,000 N physics teacher sitting on a 100 N box which is moving with a constant speed across a frictionless frozen lake.
8. A two person tug of war in which one of the participants has a weight of 700 N and the other participant has a weight of 800 N and the tension in the rope is 250 N>
9. A 14,000 N car being towed with a 25,000 N tow truck where the cable from the truck to the car makes and angle of 45° with the horizontal and the tension in the cable is 6,000 N.
10. A 100,000 N submarine which needs 15,000 N of force from the propellers to keep the submarine at a constant depth and traveling at a constant speed

Problem 1

Problem 6

Problem 2

Problem 7

Problem 3

Problem 8

Problem 4

Problem 9

Problem 5

Problem 10