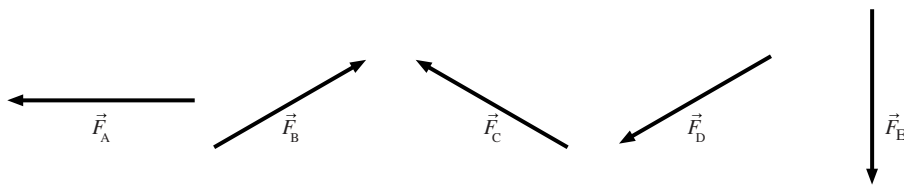


# 5

# Dynamics I: Motion Along a Line

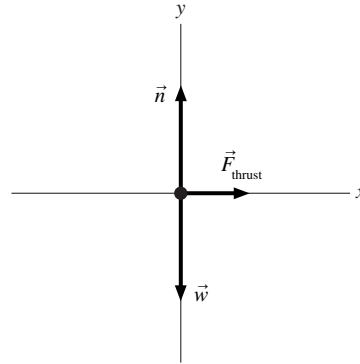
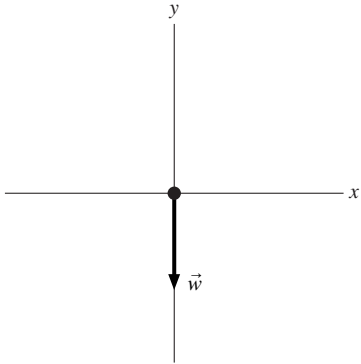
## 5.1 Equilibrium

1. The vectors below show five forces that can be applied individually or in combinations to an object. Which forces or combinations of forces will cause the object to be in equilibrium?

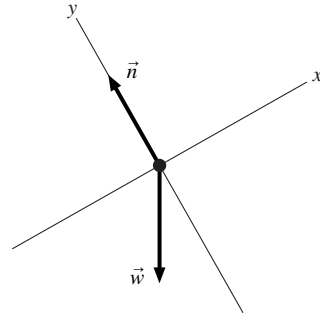
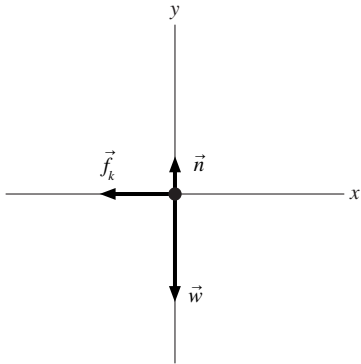


2. Are the objects described here in static equilibrium, dynamic equilibrium, or not in equilibrium at all? Answer Static, Dynamic, or Not.
- a. A girder is lifted at constant speed by a crane. \_\_\_\_\_
  - b. A girder is lowered into place by a crane. It is slowing down. \_\_\_\_\_
  - c. You're straining to hold a 200 pound barbell over your head. \_\_\_\_\_
  - d. A jet plane has reached its cruising speed and altitude. \_\_\_\_\_
  - e. A rock is falling into the Grand Canyon. \_\_\_\_\_
  - f. A box in the back of a truck doesn't slide as the truck stops. \_\_\_\_\_

3. The free-body diagrams show a force or forces acting on an object. Draw and label one more force (one that is appropriate to the situation) that will cause the object to be in equilibrium.



4. The free-body diagrams show a force or forces acting on an object. Draw and label one more force (one that is appropriate to the situation) that will cause the object to be in equilibrium.



5. Write two or three sentences explaining why you agree or disagree with the statement: “Forces cause an object to move.”

6. If you know all of the forces acting on a moving object, can you tell in which direction the object is moving? If the answer is Yes, explain how. If the answer is No, give an example.