

## PRACTICE A

### Drawing Free-Body Diagrams

1. A truck pulls a trailer on a flat stretch of road. The forces acting on the trailer are the force due to gravity (250 000 N downward), the force exerted by the road (250 000 N upward), and the force exerted by the cable connecting the trailer to the truck (20 000 N to the right). The forces acting on the truck are the force due to gravity (80 000 N downward), the force exerted by the road (80 000 N upward), the force exerted by the cable (20 000 N to the left), and the force causing the truck to move forward (26 400 N to the right).
  - a. Draw and label a free-body diagram of the trailer.
  - b. Draw and label a free-body diagram of the truck.
2. A physics book is at rest on a desk. Gravitational force pulls the book down. The desk exerts an upward force on the book that is equal in magnitude to the gravitational force. Draw a free-body diagram of the book.

## SECTION REVIEW

1. List three examples of each of the following:
  - a. a force causing an object to start moving
  - b. a force causing an object to stop moving
  - c. a force causing an object to change its direction of motion
2. Give two examples of field forces described in this section and two examples of contact forces you observe in everyday life. Explain why you think that these are forces.
3. What is the SI unit of force? What is this unit equivalent to in terms of fundamental units?
4. Why is force a vector quantity?
5. Draw a free-body diagram of a football being kicked. Assume that the only forces acting on the ball are the force due to gravity and the force exerted by the kicker.
6. **Interpreting Graphics** Study the force diagram shown in **Figure 3(a)**. Redraw the diagram, and label each vector arrow with a description of the force. In each description, include the object exerting the force and the object on which the force is acting.