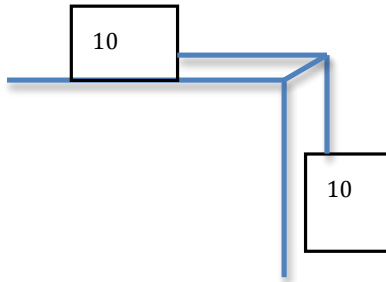


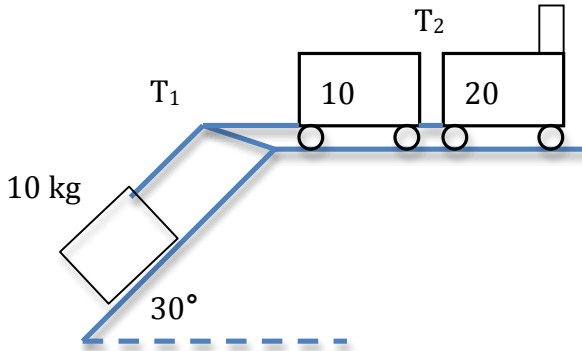
## Forces Review

1. A 5 kg box is kicked by a student and skids 15 m in 3 sec before coming to a stop.
  - a. Find the initial speed of the box.
  - b. Find  $F_f$
  - c. Find  $\mu$

2.



- a. If the system shown has no friction, find the tension.
- b. If there is friction,  $a = 2.9 \text{ m/s}^2$ . Find  $F_f$ ,  $T$ , and  $\mu$ .



3. The locomotive is pulling to the right with a force of 300 N. The 10 kg carts experience 50 N of friction each. Find  $T_1$  and  $T_2$ .

4. Fred the Astronaut is sitting on a bathroom scale in his rocket ship. The total mass of the rocket ship is 10,000 kg and Fred's mass is 50 kg. What does the scale read if the thrust of the engines is 128,000 N?
5. On a different trip to outer space, Fred sits on the scale during blast-off. The scale reads 780 N for 3 minutes.
  - a. How far has the rocket traveled?
  - b. Find its final speed.
  - c. Find the thrust of the engines.

6. How far does the system to the right move in 2 sec?

7. Find the magnitude and direction of the system's acceleration.

