## More Forces - AC

1. Elena and Jessica are pulling in opposite, horizontal directions on a 15.0 kg box. Elena is pulling with the force of 150 N and Jessica is pulling with a force of 120 N .
a. Draw the free body diagram for the box.
b. Find the acceleration of the box.
2. Akram is riding his bike at $10.0 \mathrm{~m} / \mathrm{s}$ when he slams on his brakes. He stops in 2.0 seconds. Assume that the total mass is 70.0 kg .
a. Find the acceleration of the system.
b. Draw the free body diagram for the system.
c. Calculate the magnitude (direction not needed) of the frictional force required to stop the bike.
3. Cali pulls two blocks across a frictionless surface as shown. The left block has a mass of 3.0 kg and the right block has a mass of 5.0 kg . The blocks accelerate at
 $1.5 \mathrm{~m} / \mathrm{s}^{2}$ to the right.
a. Draw the free body diagram for the left block.
b. Find the force of the right block pulling on the left block.
c. Draw the free body diagram for the right block.
d. Calculate the force that Cali applies to the right block.
4. Chase ( $\mathrm{m}=50 \mathrm{~kg}$ ) is riding an elevator while standing on a scale. At two different times along the trip, the scale reads 590 N and 440 N .
a. Draw a free body diagram for her as he accelerates upward.
b. Identify which force is greater; the Force of the floor of the elevator on her or the gravitational force on him.
c. Draw a free body diagram for him as he accelerates downward.
d. Identify which force is greater; the Force of the floor of the elevator on him or the gravitational force on him.
e. Calculate the acceleration for each reading.
