PRACTICE

1. Identify the forces on the same cart at rest.

normal force = 105 N
Weight = -105 N
- static friction

2. While the cart is moving along an aisle, it comes in contact with a smear of margarine that had recently been dropped on the floor. Suddenly the friction force is reduced from -40.0 newtons to -20.0 newtons. What is the net force on the cart if the "pushing force" remains at 40.0 newtons? Does the grocery cart move at constant velocity over the spilled margarine?

net force = +20N, NO - accel.

3. Identify the normal force on the shopping cart after 75 newtons of groceries are added to the cart.

180N

4. The shopper pays for his groceries and pushes the shopping cart out of the store, where he encounters a ramp that helps him move the cart from the sidewalk down to the parking lot. What force accelerates the cart down the ramp?

gravity

5. Compare the friction force on the cart when it is rolling along the blacktop parking lot to the friction force on the cart when it is inside the grocery store (assume the flooring is smooth vinyl tile).

a lot more friction

6. Why is it easy to get one empty cart moving but difficult to get a line of 20 empty carts moving?

more matter = more mass = more inertia