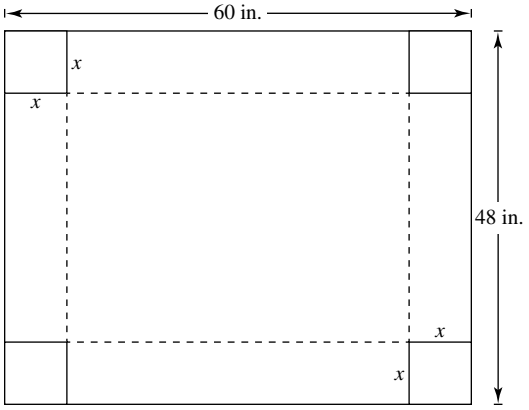
Collaborative Project – Prerequisites

1. You work at a packaging plant loading boxes onto a truck. One open box is made by cutting squares with a side length x inches from the corners of the piece of cardboard shown in the figure.



a. Write the polynomial that represents volume of the box in terms of x in standard form.

b. Find the volume when $x = 10$ and $x = 16$.

2. Another open box is made by cutting squares with side lengths y inches from a rectangular piece of cardboard. The volume of the box (in cubic inches) is $4y^3 - 180y^2 + 1944y$. Find the original dimensions of the piece of cardboard.

3. A square piece of cardboard with side length s is cut to make an open cube-shaped box. Write and simplify an expression that represents the volume of the box in terms of s.

4. The truck leaves the plant to deliver some of the boxes to a city 1350 miles south and 650 miles east.

a. Find the distance the truck has to travel, assuming it travels on one highway in a straight line.

b. The truck stops for gas halfway to its destination. Find the location that it stops in relation to the plant.

c. After the first delivery, the truck travels 200 miles north and 550 miles east to drop off the rest of the boxes in another city. Find the distance the truck has to travel to return to the plant, assuming it travels on one highway in a straight line.