# 7.14 Meet and Greet Pen

A Develop Understanding Task

Recall that Mr. Cook, from the Circle "C" Racing Pigs, wants to create a pen outside of his pig trailer so that the pigs can meet and greet their fans. He has been able to move his trailer to be placed near the intersection of two main thoroughfares so that his pigs will have more attention. The two pathways are perpendicular to each other. This time he has a new requirement: the shape of the pen will be an isosceles right triangle so that it can fit as close as possible to the thoroughfares.
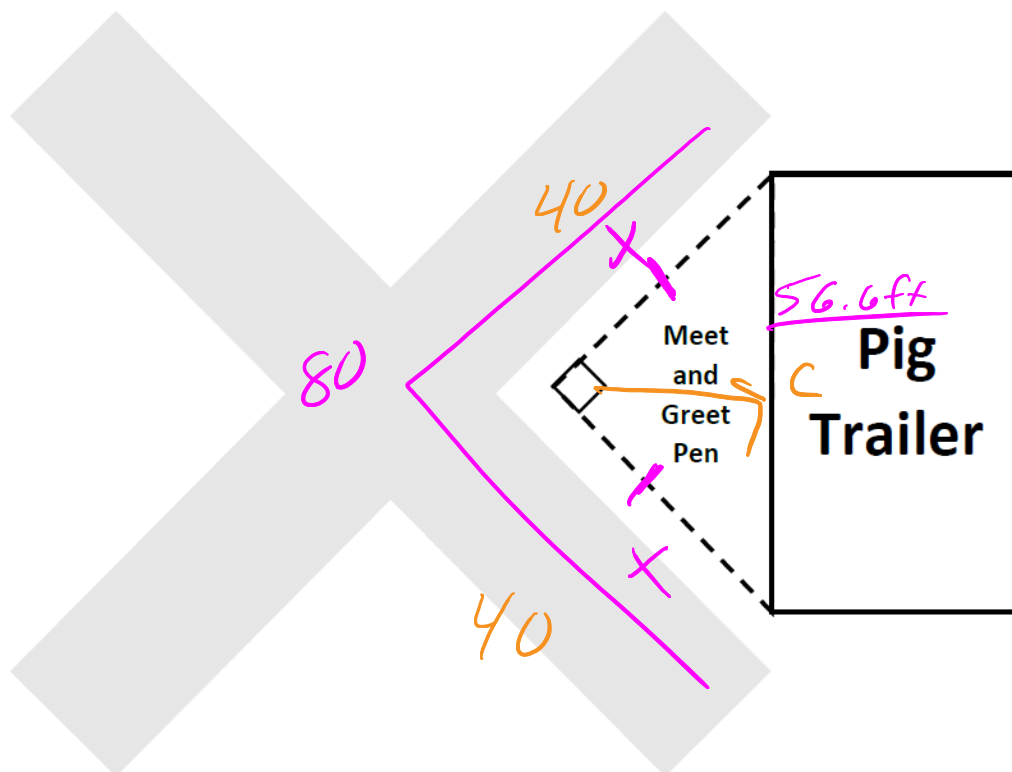
1. Write a function to represent the area of the pen. Be sure to clearly define what each of your variables represents.

$$\frac{1}{2} \cdot l \cdot w \qquad \frac{1}{2} \cdot x \cdot x$$

$$A = \frac{1}{2} x^2$$

2. Remember with the Circle "C" Racing Pigs problem, the maximum area for the pen was 800 square feet. If Mr. Cook still has 80 ft of fencing to work with, does he have enough fencing to make a pen of this shape with the same area? Justify your answer.

$$\frac{1}{2} \cdot (40)^2 = 800 \ ft^2$$

3. Although it doesn't need fencing, how long is the third side (the hypotenuse) of the right isosceles triangle?

$$40^2 + 40^2 = c^2$$
$$\sqrt{3200} = \sqrt{c^2}$$
$$56.6^{ft} = c$$

4. If Mr. Cook's trailer is 50 ft in length, can he build this pen? If the answer is no, explain how he can adjust the pen to have the maximum area, while still keeping the right isosceles triangle shape.