Section 3.6 (Mathematical Models: Building Functions)

- Identify what you’re asked (Express _______ $A$ ________ as a function of $x$).
- (if needed) Draw a picture and label variables.
- Write a (true) formula for _______ $A$ ________ in terms of any variables.
- Use the extra information in the problem to get rid of extra variables.

1. A rectangle has one corner in Quadrant I on the graph of $y = 36 - x^2$, another at the origin, a third on the positive $y$-axis and the forth on the positive $x$-axis.

   (a) Express the Perimeter $P$ as a function of $x$.
   (b) What is the domain of $x$?

2. A farmer has 200 meters of fence to enclose a rectangular pen for her goats. She will use the side of a large barn as one side of the pen and make the other three sides out of fence. Express the area of the pen $A$ as a function of $\ell$, the length of the barn-side of the pen.

3. (Optional) A circle is inscribed in a square.

   (a) Express the radius $r$ of the circle as a function of the perimeter $p$ of the square.
   (b) Express the Area of the circle $A$ as a function of the side length of the square $s$. 