Set up and solve an equation(s) to solve the following problems. Be sure to declare all variables and answer all word problems in complete sentences.

1. A gardener has 60ft of fencing and is building a rectangular garden
   a. Find the **dimensions** that would give the garden of the largest area.
   b. What is the **maximum area**

2. A farmer wants to enclose a rectangular field with an area of $400 \, m^2$.
   a. What is the smallest amount of fencing needed?
   b. What are the dimensions?

3. A soup container is to have a volume of $16\pi$ cubic inches. The material for the top and bottom costs twice as much per square cm as the side. Find the dimensions of the can with
   a. the smallest surface area
   b. the cheapest production cost