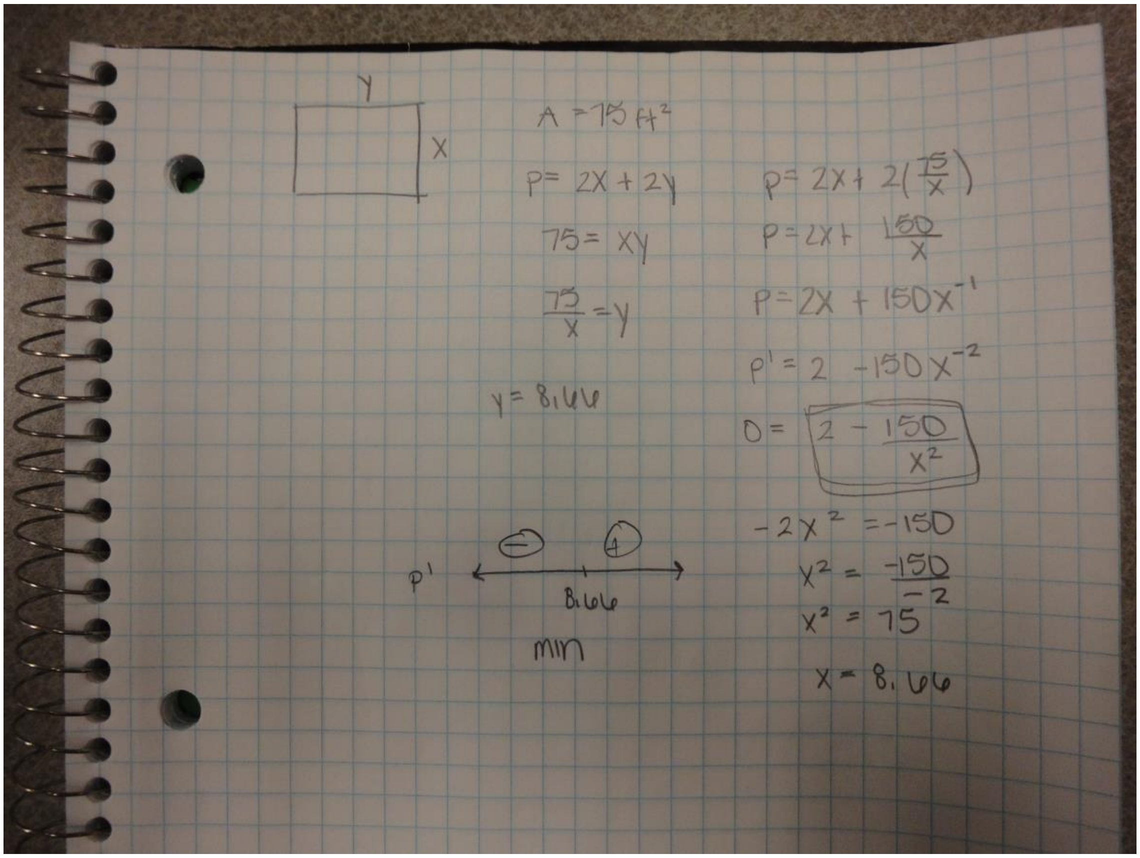
Optimization

**Cylinder Problem.** This was done for you in class; you can also find the solution in your textbook (see p. 260, Example 2).

**Rectangle Problem.**




A couple of additions to the above work:

(1) We should indicate that $x > 0$ (only positive $x$ makes sense for length).

(2) After we find $x \approx 8.66$ corresponds to a minimum perimeter, we find that $x = y \approx 8.66$. In other words, our "rectangle" is actually a square. Intuitively, this makes sense as some rectangles with long sides might have a very large perimeter. The square shape uses the least amount of material (e.g., think of a fence) if we assume a rectangular shape with a fixed area.