## Problem 1

Suppose we want build a rectangular fence along a straight river (one side doesn't need fence) and we need the enclosed area to be $200 \mathrm{ft}. .^{2}$. What is the least amount of fence we could use? What are the dimensions of the resulting fence?

## Problem 2

Find the dimensions of the largest rectangle that can fit in a semicircle of radius 3 .

## Problem 3

What point on the graph of $y=\sqrt{x}$ is closest to the point $\left(\frac{3}{2}, 0\right)$ ?
Hint: The distance between two points $\left(x_{1}, y_{1}\right),\left(x_{2}, y_{2}\right)$ is $\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}$, and all of the points on the graph of $y=\sqrt{x}$ are of the form $(x, \sqrt{x})$.

