Section 4.6 Optimization

Now we will use calculus to solve **optimization problems**, which are problems that involve finding the absolute maximum or absolute minimum of a function.

**Strategy for Solving Optimization Problems**

1. Introduce variables, look for relationships among the variables, and construct a mathematical function over an interval *I.*
2. Find the critical numbers of the function.
3. Find the absolute maximum (or minimum) of the function on the interval *I.*
4. Answer all of the questions asked in the problem.

# Topic 1: Area and Perimeter

# Topic 2: Maximizing Revenue and Profit

When graphing the revenue and profit function, notice that the maximum revenue and maximum profit usually occur at different production levels. The maximum profit occurs when , that is when the marginal revenue is equal to the marginal cost. Notice that the slopes of the revenue function and the cost function are the same at this production level. When the optimal value (absolute maximum or absolute minimum) occurs at an endpoint rather than a critical number in the interior of the interval, it is called an **endpoint solution**.

# Topic 3: Inventory Control

When considering how much inventory to keep on hand, the cost of storing the inventory must be considered.