Section 4.7 Optimization

Example 1: An open top box is to be made by cutting congruent squares from the corners of an 18 by 12 inch sheet of paper and bending up the sides. What dimensions give the box the largest volume?

1. Draw and label a picture.

2. Decide what you want to optimize.

3. Write an equation to represent this.

4. Write down any other facts. (Constraints, other equations)

5. Get optimization equation in terms of one variable.

6. Take the first derivative and set it equal to zero to find critical numbers.

7. Verify if critical number is a max or min with sign chart or 2nd derivative.

8. Answer question using complete sentence.

Example: Trevor has 2400 ft of fencing and wants to fence off a rectangular field that borders a straight river. He needs no fencing along the river. What are the dimensions of the field that has the largest area?

Example:Malcolm is designing a cylindrical can to hold 1liter (or 1000 cubic centimeters) of oil. Find the dimensions of the can that will minimize the cost to manufacture the can.

Example: Izzy wants to calculate the dimensions of the rectangle with maximum area that can be inscribed in a semicircle with diameter of 6 units.

Practice: p283 #3,7,9,11,22,30,36