

## Section 5.5: Applied Maximum and Minimum Problems

*EXAMPLE 1:* A company wants to manufacture a box with a volume of 36 cubic feet. The box has no top, and the length is twice the width. Find the dimensions of the box that minimizes the amount of material used.

*EXAMPLE 2:* A poster is to have an area of 180 square inches with 1-inch margins at the bottom and sides and a 2-inch margin at the top. What dimensions will give the largest printed area?

*EXAMPLE 3:* Find the point on the line  $y = 2x - 3$  that is closest to the point  $(-1, 3)$ .

*EXAMPLE 4:* Find the dimensions of the rectangle of largest area that has its base on the  $x$  axis and its other two vertices above the  $x$  axis lying on the parabola  $y = 8 - x^2$ .

*EXAMPLE 6:* Find the dimensions of the largest isosceles triangle that can be inscribed in a circle of radius 4.

*EXAMPLE 5:* A piece of wire 10 m long is cut into two pieces. One piece is bent into a square and the other is bent into a circle. How should the wire be cut so that the total enclosed area is a maximum? A minimum?