

## **Lesson 26: Optimization (Part 3)**

**Ex. 1** Dr. Weir wants to build a recreational swimming area along the side of Atlantis. Three walls will be fenced and Atlantis will serve as the fourth wall. The ideal area is  $2500 \text{ m}^2$ . The fencing material costs  $\$15/\text{m}$ . What is the least amount of money needed to build the fence?

**Ex. 2** Teal'c builds a box of volume  $300 \text{ cm}^3$ . The length of the base needs to be 2 times the width of the base. The sides of the box are made of trinium while the top and bottom of the box are made of ebony. Ebony costs  $\$5/\text{cm}^2$  and trinium costs  $\$20/\text{cm}^2$ . Find the dimensions of the box that will minimize the cost of construction.

**Ex. 3** Dunder Mifflin has determined that if their paper is sold at  $p$  dollars per ream, it can sell  $q = 1800 - 50p$  reams. Each ream costs \$3 to make.

How much should Dunder Mifflin charge to maximize their revenue?

How much should they charge to maximize profit?

**Ex. 4** Find the points on the curve  $y = x^2 + 2$  closest to the point  $(0,7)$ .

**Ex. 5** Find the point on the curve  $y = 7x + 1$  closest to the point  $(0,2)$ .

**Answer:**  $(\frac{7}{50}, \frac{99}{50})$