

Section 5.5

Exercise 1. Find 2 numbers whose sum is 50 and whose product is maximum.

Exercise 2. A farmer with 750ft of fencing wants to enclose a rectangular area and then divide it into four pens with fencing parallel to one side of the rectangle. What is the largest possible total area of the 4 pens?

Exercise 3. A rectangular storage container with an open top is to have a volume of 10m^3 . The length of its base is twice the width. Material for the base costs 10 per square meter. Material for the sides costs 6 per square meter. Find the cost of materials for the cheapest such container.

Exercise 4. Find the points on the hyperbola

$$y^2 - x^2 = 4$$

that are the closest to the point $(2, 0)$.

Exercise 5. A Norman window has the shape of a rectangle surmounted by a semicircle. (thus the width of the rectangle is equal to the diameter of the semicircle. If the perimeter is 30ft, find the dimensions of the windows so that the greatest possible amount of light is admitted.

Exercise 6. A piece of wire 10m long is cut into 2 pieces. One piece is bent into a square and the other is bent into an equilateral triangle. How should the wire be cut so that the area enclosed is maximum? minimum?

Exercise 7. A cylindrical can without a top is made to contain V cm³ of liquid. Find the dimensions that will minimize the cost of metal to make the can.

Exercise 8. Where should the point P be chosen on the line segment AB so as to maximize the angle θ .

