

Chapter 4:4: Optimization and Modeling

Calculus I

College of the Atlantic. Halloween, 2022

1. You recently acquired three alpacas and need to fence in a pasture so they don't wander off. Fortunately, you have a tall stone wall along one side of your property. So you'll need to build three walls, not four, to produce a nice rectangular field. You can afford 100 meters of fencing material. What dimensions should your field be so as to maximize the area available to the alpacas?
2. You have a piece of wire of length L . You wish to use this wire to make a rectangle. What dimensions for the rectangle will maximize the area?
3. What point along the curve $y = \sqrt{x}$ is closest to the point $(4, 0)$?
4. You have a piece of wire of length L . You will cut this wire into two pieces. You will use one of the pieces of wire to make a circle and the other piece of wire to make a square. How should you cut the wire so that the resulting area of the two shapes is maximized?