Calculus Name_____ ID: 1

Check up 8

Date_____

Solve each optimization problem.

1) A rancher wants to construct two identical rectangular corrals using 500 m of fencing. The rancher decides to build them adjacent to each other, so they share fencing on one side. What dimensions should the rancher use to construct each corral so that together, they will enclose the largest possible area?

2) A supermarket employee wants to construct an open-top box from a 10 by 16 cm piece of cardboard. To do this, the employee plans to cut out squares of equal size from the four corners so the four sides can be bent upwards. What size should the squares be in order to create a box with the largest possible volume?

3) Which points on the graph of $y = 5 - x^2$ are closest to the point $(0, 2)$?

4) A manufacturer needs to make a cylindrical can that will hold 1.5 liters of liquid. Determine the dimensions of the can that will minimize the amount of material used in its construction in centimeters.

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$\frac{125}{2}$ m (non-adjacent sides) by $\frac{250}{3}$ m (adjacent sides)

2) A supermarket employee wants to construct an open-top box from a 10 by 16 cm piece of cardboard. To do this, the employee plans to cut out squares of equal size from the four corners so the four sides can be bent upwards. What size should the squares be in order to create a box with the largest possible volume?

2 cm

3) Which points on the graph of $y = 5 - x^2$ are closest to the point $(0, 2)$?

$\left(-\frac{\sqrt{10}}{2}, \frac{5}{2}\right), \left(\frac{\sqrt{10}}{2}, \frac{5}{2}\right)$

4) A manufacturer needs to make a cylindrical can that will hold 1.5 liters of liquid. Determine the dimensions of the can that will minimize the amount of material used in its construction in centimeters.

12.4 cm