MA 158

Quiz 3

23 septembre 2016

Instructions: Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (4 points) You have 556 feet of fencing to enclose a rectangular plot of land. Find the dimensions of the rectangular plot that would maximize the area.

Solution. The total length of fencing is 556 feet. If x and y are the dimensions of the fenced-in area, then

$$L = 556 = 2x + 2y.$$

Solving for y,

$$2y = 556 - 2x$$

$$y = \frac{556 - 2x}{2}$$

$$y = 278 - x.$$
(*)

Then the area is given by

$$A = xy$$

= $x(278 - x)$
= $278x - x^2$.

To find the maximum area, we want to find the vertex. Note that this is indeed a maximum since our "a" is negative. So the "h" value of the vertex is $\frac{-278}{2(-1)} = 139$. Since our expression for area was A(x), this is the x-dimension. To find y, we use (*), to see that

$$y = 278 - 139 = 139.$$

So the dimensions of the rectangular plot are 139×139 . The total area is 19,321, but you were not asked to find this.

Problem 2. (0 points) If you were Mitch Daniels for a day, what would be your first action?

In case you didn't know, Mitch Daniels is the president of Purdue University and was the governor of Indiana from 2005 to 2013.

Students' answers.

- Pay professors more.
- Run for POTUS.
- Make it so that if you have a C for the semester you wouldn't have to take the final.
- Chillin' in my nice mansion if that is an action.
- Go to the bathroom.
- Make America great again.
- Cancel class.
- Visit the moon.
- Institute "Free Ice Cream Fridays".
- Give a week-long holiday.
- Fly a plane around Purdue.
- Eat breakfast.
- Make laundry free and paint this room anything but white.