Closing Tues: HW 14.2 (part 2)

Closing Thur: HW 14.3/4 (last HW)

Final: Sat, March 10, 5:00-7:50pm,

Final Room is based on quiz section

For BC/BD, AC/AD: PAA A102

For AA/AB, BB: PAA A118

For BA: PAA A110

Entry Task:

Find all critical points of

$$z = f(x, y) = 2x^4 + y^2 - 4xy + 1$$

You do (HW Problem 14.2/5)

$$z = -6x^2 + 2x - 4y^2 - 3y + 8xy + 30$$

a. Find the critical point.

b. Find the largest and smallest values of f(2,y) on the interval y=-4 to y=0.

c. Suppose (x,y) = (-6,-7).
A small increase in x will lead to a LARGER/SMALLER increase in z than a small increase in y. (circle either larger or smaller)

d. Which is steepest at x = 1?
f(x,4), f(x,6), f(x,8) or f(x,10)

Example (From HW 14.2/6)
Find the critical point for

$$f(x,y) = 12 + xy + \frac{27}{x} + \frac{8}{y}$$

More Applications

Cost Breakdown (14.3/1-2)

Suppose the cost to produce ONE item is given by:

$$C(x, y) = 3x^2 + 4y^2 + 5xy + 10,$$

where

$x =$ cost for 1 hour of labor, and

$y =$ cost for 1 pound of materials.

Question:

The current hourly rate for labor is \$20 and material is \$55 per pound.

How will a \$1 per hour raise for labor affect the cost to produce 1 item?

Marginal Productivity (14.3/5-6)

Suppose that the number of crates of a particular fruit produced is

$$z = \frac{9xy - 0.0002x^2 - 5y}{0.03x + 4y}$$

where

$x =$ number of hours of labor, and

$y =$ number of acres of the crop.

Find the marginal productivity of the number of hours of labor when x = 100 and y = 200.

Interpret your answer

Combined (Joint) Revenue and Cost

Next time….