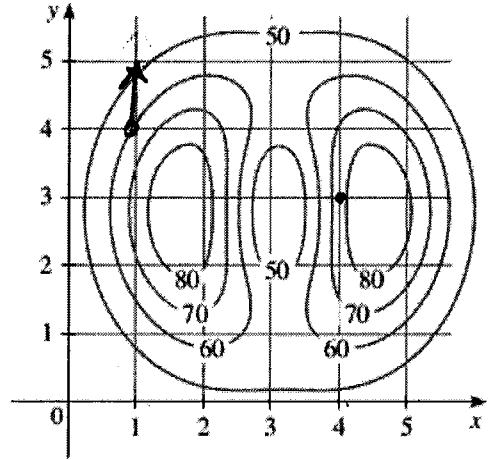


Key

Quiz 5

This is a two-stage quiz. During the first stage, use your knowledge & calculator. You have 15 min. In the second stage, you are now welcome to use your books, notes, and students in the class to retake the same quiz. You have the remainder of the quiz time to write one solution (with everyone's name on it!!!) to be turned in for the group.

1. Consider the contour map of f shown on the right.



WebHW #1

(a) [1] Estimate $f(1,4) \approx 60$

\downarrow (1,5) \downarrow (1,5)

Several Variables Activity #3

(b) [1] Estimate $\lim_{(x,y) \rightarrow (4,3)} f(x,y) = f(4,3) \approx 75$

f is looking pretty continuous

Write HW 1/4, 3 #6

(c) [2] Estimate $f_y(1,4) = \frac{\partial z}{\partial y} \Big|_{(1,4)} \approx \frac{\Delta z}{\Delta y} \approx \frac{-10}{1} = -10$

(1,5) see on graph
(4,5) for x
(1,5) notation

In 3D (1,5)
eg of line (1,5)
3D Calc Activity #4

(d) [3] Find the equation of a line (any line!) that is tangent to f at $(1,4)$. Feel free to use above approx.

Sooooo... many answers?

$\vec{r} = \vec{r}_0 + t\vec{v}$ where $t \in \mathbb{R}$ OR $z - z_0 = m_x(x - x_0) + m_y(y - y_0)$

$\vec{r} = (1, 4, 60) + t(0, 1, -10)$

from (a) (1,5) from (c) (1,5)

(part a) $\frac{\partial z}{\partial x} \approx \frac{10}{.5}$ $\frac{\partial z}{\partial y} \approx -10$ (part c)

$z - 60 = 20(x - 1) - 10(y - 4)$

2. [3] Let $g(x,y) = x^3 \cos(y)$. Find $g_x(2,0)$.

WebHW 1/3 #3

(1) Treat y as a constant?

$g_x(x,y) = \underbrace{\cos(y)}_{\text{constant}} \cdot [x^3]' = \cos(y) \cdot 3x^2 = 3x^2 \cos(y)$

(1) power rule
(1,5) notation / der before #'s

so $g_x(2,0) = 3 \cdot (2)^2 \cos(0)$

$= 3 \cdot 4 \cdot 1$

$= 12$

(1,5)