Math 001D Assignment 14.3   Ans_____

Instructions: Write complete solutions to the following problems in the space provided. Besure to supply all the necessary steps that lead to your answers

1.   Let $f(x,y) = 4 - x^2 - y^2$, Find

a. $\dfrac{\partial f}{\partial x}(2,0)$ and interpret the partial derivative as a slope.

b. $\dfrac{\partial f}{\partial y}(2,0)$ and interpret the partial derivative as a slope.

2.   Let $f(x,y) = \sqrt{2 - x^2 - y^2}$, Find

a. $\dfrac{\partial f}{\partial x}$ $=$

b. $\dfrac{\partial f}{\partial y}$

c. $\dfrac{\partial f}{\partial y \partial x}$

d. $\dfrac{\partial f}{\partial x \partial y}$

3. Let $w(x, y, z) = \ln\left(2x - y + z^2\right)$, Find

a. $\dfrac{\partial w}{\partial x}$

b. $\dfrac{\partial w}{\partial y}$

c. $\dfrac{\partial w}{\partial z}$

d. $\dfrac{\partial w}{\partial x \partial z}$

4. The table below shows wind chill (how cold it "feels" outside) as a function of temperature t (degree Fahrenheit) and wind speed s (mph). We can think of this function as C(s,t).

Estimate the partial derivatives $\dfrac{\partial C}{\partial t}(20, 20)$, and $\dfrac{\partial C}{\partial s}(20,20)$ using forward difference, backward difference and forward/backward difference and interpret each derivative.

s/t	-10	0	10	20	30
0	-10	0	10	20	30
5	-15	-5	6	16	27
10	-33	-24	-9	4	16
15	-45	-32	-18	-5	9
20	-53	-39	-25	-10	4
25	-59	-44	-29	-15	0
30	-63	-48	-33	-18	-2

Smith and Minton.