11.3 Partial Derivatives

Example 1

Relative humidity (%)										
Actual Temperature (°F)		50	55	65	70	75	80	85	90	95
	90	96	98	100	103	106	109	112	115	119
	92	100	103	105	108	112	115	119	123	128
	94	104	107	111	114	118	122	127	132	137
	96	109	113	116	121	125	130	135	141	146
	98	114	118	123	127	133	138	144	150	157
	100	119	124	129	135	141	147	154	161	168

How fast is the heat index changing when the temperature is 96°F and the humidity is 70%?

Partial Derivative of $f(x, y)$ with respect to x and y.

Example 2

If $f(x, y) = e^x \sin y$, then find $f_x(1, \pi)$ and $f_y(1, \pi)$.

Interpretations of Partial Derivatives

Example 3

If $f(x,y) = \sqrt{\frac{x}{x+y}}$, then find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.

Example 4

Find $\partial z/\partial x$ and $\partial z/\partial y$ if z is defined implicitly by

$$x^3 + y^3 + z^3 + 6xyz = 1$$

Functions of more than 2 variables

Higher Order Derivatives

Example 5

Find the second order partial derivatives of $f(x, y) = x^3 + 6x^2y - y^2$

Clairout's Theorem

Partial Differential Equations

Laplace's Equation

Wave Equation

Cobb-Douglas Production Formula

HW # 1, 11, 13, 15, 21, 27, 35, 41, 45, 47, 49, 64, 71, 77