Introduction to Functions of Several Variables

1. Determine whether z is a function of x and y
(Similar to p.894 #3-6)

$$xz^4 + \ln x - xy = 3$$

2. Determine whether z is a function of x and y
(Similar to p.894 #3-6)

$$x^2 z + xyz - y = 0$$

3. Find and simplify the function values
(Similar to p.894 #7-18)

$$f(x, y) = x^2 y - 3x$$

$a)$ $(4,2)$

$b)$ $(1,-2)$

$c)$ $(0,t)$

4. Find and simplify the function values
(Similar to p.894 #7-18)

$$f(x, y, z) = \frac{3xy}{z}$$

$a)$ $(1,-3,4)$

$b)$ $(0,2,5)$

$c)$ $(1,2,12)$

5. Find and simplify the function values
(Similar to p.894 #7-18)

$$f(x, y, z) = \sqrt{x - y - z}$$

$a)$ $(12,2,1)$

$b)$ $(5,-10,-10)$

$c)$ $(8,7,1)$

6. Find and simplify the function values
(Similar to p.894 #7-18)

$$f(x,y)=3x^2+y$$

$$a)\ \frac{f(x+\Delta x,y)-f(x,y)}{\Delta x}$$

$$b)\ \frac{f(x,y+\Delta y)-f(x,y)}{\Delta y}$$

7. Describe the domain and range of the function
(Similar to p.894 #19-30)

$$f(x,y)=4x^2-y$$

8. Describe the domain and range of the function
(Similar to p.894 #19-30)

$$f(x,y)=\frac{7xy}{x-3y}$$

9. Describe the domain and range of the function
(Similar to p.894 #19-30)

$$f(x,y)=\sqrt{1-x^2-y^2}$$

10. Sketch the surface given by the function
(Similar to p.894 #33-40)

$$f(x,y)=2+3x-y$$

11. Sketch the surface given by the function
(Similar to p.894 #33-40)

$$f(x,y)=3\sqrt{x^2+y^2}$$

12. Sketch the surface given by the function
(Similar to p.894 #33-40)

$$f(x, y) = e^x$$

13. Describe the level curves of the function. Sketch the level curves for the given c-values
(Similar to p.894 #33-40)

$$z = 3x + y, \quad c = -1,0,1,3$$

14. Describe the level curves of the function. Sketch the level curves for the given c-values
(Similar to p.894 #33-40)

$$z = 2x^2 + y^2, \quad c = 0,1,2,3$$