

February 28, 2007
Sec. 8.1 Answer Questions

Problem #9

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

$$f(2, 1) = \frac{1}{\sqrt{2-1}} = 1$$

$$f(-1, -5) = \frac{1}{\sqrt{-1-(-5)}} = \frac{1}{\sqrt{4}} = \frac{1}{2}$$

Problem #11

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

Domain: all x's and all y's; x all real numbers and y all real numbers

Problem #13

$$f(x, y) = x/(x + y)$$

x + y can't be 0

$$x + y \neq 0$$

Problem #15

$$f(x, y) = \sqrt{16 - x^2 - y^2}$$

$$16 - x^2 - y^2 \geq 0$$

$$16 \geq x^2 + y^2$$

$$x^2 + y^2 \leq 16$$

Problem #17

distance between points (1, 2, 3) and (0, 4, 5)

$$\sqrt{(1-0)^2 + (2-4)^2 + (3-5)^2} = \sqrt{1+4+4} = \sqrt{9} = 3$$

Problem #25

$$x^2 + y^2 + z^2 = 36$$

sphere centered at the origin, radius of 6

Problem #27

$$f(x, y) = \frac{1}{1+x^2+y^2}$$

As x and y become large, z goes to 0

$$f(0, 0) = 1$$

Level curve f

Problem #35

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

$$z_0 = 1$$

$$1 - x^2 - y^2 = 1$$

$$x^2 + y^2 = 0$$

$$z_0 = 0$$
$$1 - x^2 - y^2 = 0$$
$$x^2 + y^2 = 1$$

$$z_0 = -3$$
$$1 - x^2 - y^2 = -3$$
$$x^2 + y^2 = 4$$

$$z_0 = -8$$
$$x^2 + y^2 = 9$$

