Math 60
HW 1
Tuesday, May 17, 2016

2.1.{2, 16, 19, 31, 33, 42}, 2.2.{16, 28}

2.1.2 Let $g : \mathbf{R^2} \to \mathbf{R}$ be given by $g(x, y) = 2x^2 + 3y^2 - 7$.

(a) Find the domain and range of g.

(b) Find a way to restrict the domain to make a new function with the same rule of assignment as g that is one-one.

(c) Find a way to restrict the codomain to make a new function with the same rule of the assignment as g that is onto.

■

2.1.16 For the function $f(x,y) = x^2 + y^2 - 9$:

(a) Determine several level curves of the given function f (make sure to indicate the height c of each curve)

(b) Use the information obtained in part (a) to sketch the graph of f.

■

2.1.19 For the function $f(x, y) = xy$:

(a) Determine several level curves of the given function f (make sure to indicate the height c of each curve)

(b) Use the information obtained in part (a) to sketch the graph of f.

■

2.1.31 Given a funciton $f(x, y)$, can two different level curves of f intersect? Why or why not?

■

2.1.33 Describe the graph of $g(x, y, z) = x^2 + y^2 - z$ by computing some level surfaces (If you prefer, use a computer to assist you).

■

2.1.42 Sketch or describe the surfaces in $\mathbf{R}^3$ determined by the equation $x = \dfrac{y^2}{4} - \dfrac{z^2}{9}$.

■

2.2.16 Evaluate the limits in Exercises 7 - 21, or explain why the limit fails to exist:

$$\lim_{(x,y)\to(0,0)} \frac{x^2}{x^2+y^2}$$

■

2.2.28 Some limits become easier to identify if we switch to a different coordinate system. In Exercises 28 - 33 switch from Cartesian to polar coordinates to evaluate the given limits.

$$\lim_{(x,y)\to(0,0)} \frac{x^2 y}{x^2 + y^2}$$

■