

2.1: 6, 18, 21, 29, 33; 2.2: 14, 15, 46

2.1.6 Find the domain and range.

$$g(x, y, z) = \frac{1}{\sqrt{4 - x^2 - y^2 - z^2}}$$

■

2.1.18

$$f(x, y) = 4x^2 + 9y^2$$

- (a) Determine several level curves of the given function f (make sure to indicate the height c of the curve)
- (b) Use the information obtained in part (a) to sketch the graph of f .

■

2.1.21

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

- (a) Determine several level curves of the given function f (make sure to indicate the height c of the curve)
- (b) Use the information obtained in part (a) to sketch the graph of f .

■

2.1.29

- (a) Graph the surfaces $z = x^2$ and $z = y^2$
- (b) Explain how one can understand the graph of the *surfaces* $z = f(x)$ and $z = f(y)$ by considering the *curve* in the uv -plane given by $v = f(u)$.
- (c) Graph the surface in \mathbf{R}^3 with equation $y = x^2$.

■

2.1.33

$$g(x, y, z) = x^2 + y^2 - z$$

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

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2.2.14 Evaluate the limit or explain why the limit fails to exist.

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

■

2.2.15 Evaluate the limit or explain why the limit fails to exist.

$$\lim_{(x,y) \rightarrow (0,0)} \frac{x^4 - y^4}{x^2 + y^2}$$

■

2.2.46 Determine the value of the constant c so that

$$g(x, y) = \begin{cases} \frac{x^3 + xy^2 + 2x^2 + 2y^2}{x^2 + y^2} & \text{if } (x, y) \neq (0, 0) \\ c & \text{if } (x, y) = (0, 0) \end{cases}$$

is continuous.

■