

2.14

1. Find the domain of the function $g(x, y) = \frac{\ln(2-x)}{1-x^2-y^2}$.
2. Find the range of the function $g(x, y) = x^2 \ln(x + y)$.
3. Find the limit.

$$\lim_{(x,y) \rightarrow (3,2)} (x^2 y^3 - 4y^2)$$

4. Show that the limit does not exist.

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

5. Use the Squeeze Theorem to find the limit.

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

$$\lim_{(x,y) \rightarrow (0,0)} xy \sin\left(\frac{1}{x^2 + y^2}\right)$$

6. Determine the set of points at which the function is continuous.

$$F(x, y) = \cos \sqrt{1 + x - y}$$

7. Find the first partial derivatives of the function.

$$f(x, y) = x^4 + 5xy^3$$

$$f(x, y) = \ln(x + 2y + 3z)$$

$$u = x^{y/z}$$