

Math 2551 Worksheet Section 14.1

1. Find and sketch the domain for each function.

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

(b) $f(x, y) = \sqrt{(x - 4)(y^2 - 1)}$.

(c) $f(x, y) = \cos^{-1}(y - 4x^2)$.

(d) $f(x, y) = \frac{1}{4 - x^2 - y^2}$.

(e) $f(x, y) = \frac{1}{\ln(4 - x^2 - y^2)}$

2. Let $f(x, y) = \sqrt{1 - xy}$.

(a) Find and sketch the domain of f .

(b) Sketch the level curve $f(x, y) = 2$.

3. Find an equation for the level curve of the function $F(x, y) = \frac{2y - x}{x + y + 1}$ passing through $(-1, 1)$.

4. Find the equation for the level surface of the function $f(x, y, z) = \sqrt{x^2 + y^2 + z^2}$ passing through $(1, 1, 1)$.