Problem 1

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

    a) Find the function's domain and range.

    b) Describe the function's level curves.

    c) Find the boundary of the function's domain.

    d) Determine if the domain is open, closed or neither.

    e) Determine is the domain is bounded or unbounded.

Problem 2

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

   a) Find the function's domain and range.

   b) Describe the function's level curves.

   c) Find the boundary of the function's domain.

   d) Determine if the domain is open, closed or neither.

   e) Determine is the domain is bounded or unbounded.

Problem 3

Let $f(x, y) = \dfrac{1}{\ln(x^2 + y^2)}$.

    a) Find the function's domain and range.

    b) Describe the function's level curves.

    c) Find the boundary of the function's domain.

    d) Determine if the domain is open, closed or neither.

    e) Determine is the domain is bounded or unbounded.