

$G(x, y) = \ln(x^2 + y^2 - 4) = g(f(x, y))$, where $f(x, y) = x^2 + y^2 - 4$, continuous on \mathbb{R}^2 , and $g(t) = \ln t$, continuous on its domain $\{t \mid t > 0\}$. Thus G is continuous on its domain $\{(x, y) \mid x^2 + y^2 - 4 > 0\} = \{(x, y) \mid x^2 + y^2 > 4\}$, the exterior of the circle $x^2 + y^2 = 4$.