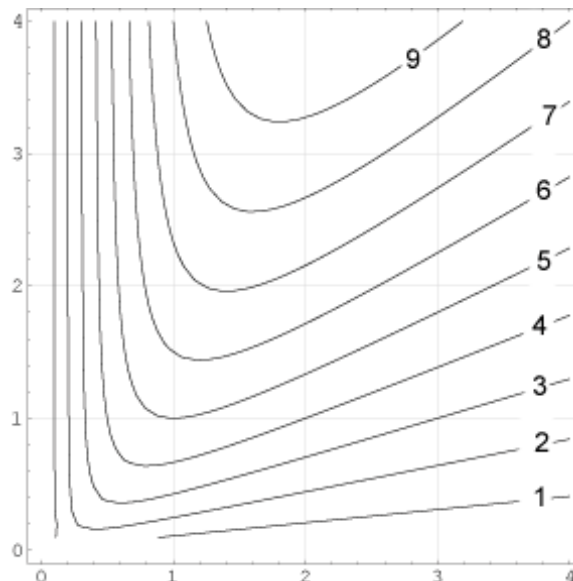


1. Using the given level curves of an unknown function $f(x, y)$, estimate the values of the partial derivatives of f at the points $(1, 1)$ and $(2, 1)$. Explain your estimates. (8 points)



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2. Let $f(x, y) = \frac{xy}{x^2 + y}$. Compute the exact values of the partial derivatives of f at the point $(2, 1)$. (6 points)

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3. Find an equation of the tangent plane to the surface $z = (x^2 + y^2)^2$ at the point $(1, 1, 4)$. (6 points)