# Quiz 2

Be sure to follow the quiz instructions in order to avoid a deduction in points. Submissions are due in Gradescope by 11:59pm on Friday; no late work is accepted.

**Name:**

*Question #1:* Compute $f_{xx}$ and $f_{yx}$ for the function $f(x, y) = x\tan(y^2) + \sqrt{6x - y}$. [AJN]

$f_{xx} =$

$f_{yx} =$

*Question #2:* Use the function $z = f(x, y)$ and the point $P$ to answer the questions below.

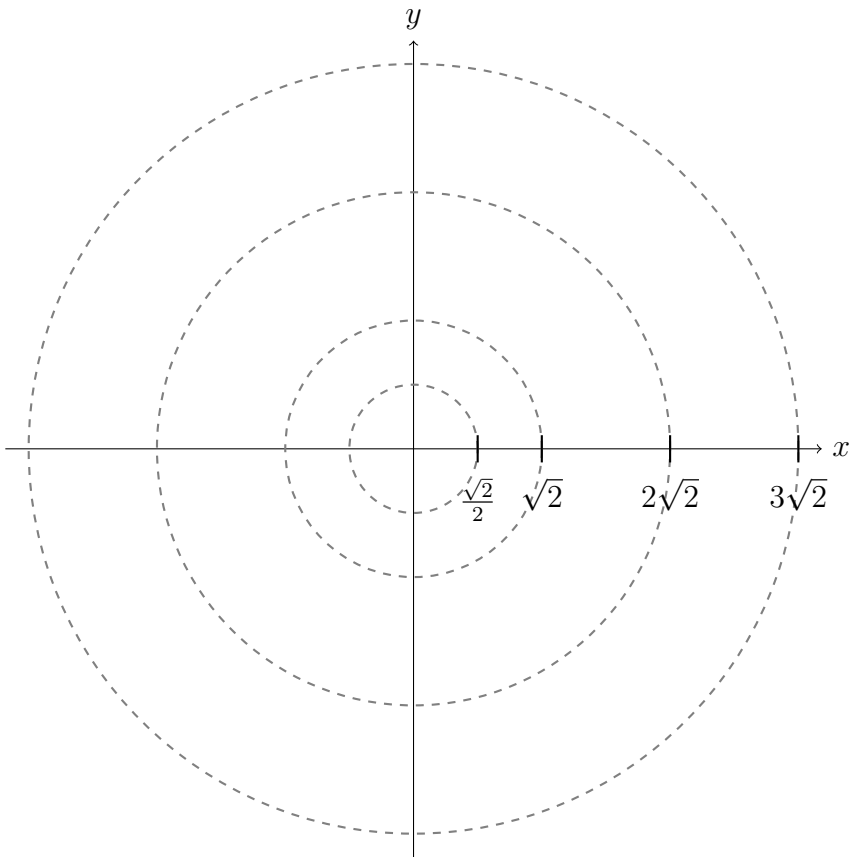
$$f(x, y) = 2\ln(x^2 + y^2) \text{ and } P(2, -2)$$

(a) Find the gradient $\nabla f$ of $f$.

(b) Find the directional derivative $D_{\mathbf{u}}f$ of $f$ in the direction of $\mathbf{u} = \langle 1, 3\rangle$ at $P(2, -2)$.

(c) Find a unit vector $\mathbf{v}$ which points in the direction which *maximizes* the value of $D_{\mathbf{u}}f$ at $P(2, -2)$.

(d) Sketch $P(2, -2)$ and the gradient vector $\nabla f(P)$ on the axes provided. [AJN]



*Question #3:* Evaluate $\frac{\partial W}{\partial t}$ at the point $(s,t) = (1,e)$. [AJN]

$$W = x \ln y,\ x = s + t^2,\ y = st.$$