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# Math 102 – Section 12– Quiz 4

**Problem 1.** Assume $f$ is a differentiable function of $x$ and $y$. Let $z = f(\sqrt{s}e^{sr}, s\cos r)$. Use the following values

$$f(4,0) = 2, \quad f_x(4,0) = 1, \quad f_y(4,0) = -2, \quad f(2,4) = 5, \quad f_x(2,4) = 3, \quad f_y(2,4) = -1$$

to compute $\left.\dfrac{\partial z}{\partial s}\right|_{(s,r)=(4,0)}$.

**Problem 2.** Find the maximum rate of change of the function $f(x,y) = y^2 + x\ln(xy)$ at the point $(2, \frac{1}{2})$ and the direction in which it occurs?