Math 241H - Section 0301 - Fall 2017 Name:_____
Quiz 4

You have 10 minutes to complete this quiz. No calculator, cheat sheet or aid of any kind is allowed.

1.[10pts] Consider the multivariable function,

$$f(x,y) = x\ln(x^2+y^2), \quad x,y \neq 0.$$

Compute the partial derivatives $f_x, f_y, f_{xx}, f_{yy}, f_{xy}, f_{yx}$ for any $x, y \neq 0$.

Solution: Taking the derivatives one should obtain,

$$\begin{aligned}
f_x &= \ln(x^2+y^2) + \frac{2x^2}{x^2+y^2} \\
f_y &= \frac{2xy}{x^2+y^2} \\
f_{xx} &= \frac{2x^3+6xy^2}{(x^2+y^2)^2} \\
f_{yy} &= \frac{2x(x^2-y^2)}{(x^2+y^2)^2} \\
f_{xy} &= \frac{2y^3-2yx^2}{(x^2+y^2)^2} \\
f_{yx} &= \frac{2y^3-2yx^2}{(x^2+y^2)^2}
\end{aligned}$$