MATH 105 Quiz # 2 Friday Jan 22, 2016 (4 questions, two sides) **FAMILY NAME:**
STUDENT NUMBER:

1. Compute $\frac{\partial}{\partial x}\left(\frac{xy}{2x+y}\right)$

2. Given $f(x, y) = xy + \cos(xy)$, determine $f_x(x, y)$ and $f_{xy}(x, y)$.

3. Given $f(x, y) = 2x^3 - 6xy + 3y^2$, determine the critical points of $f(x, y)$.

4. Given that $f(x,y) = x^4 - 4xy + y^4$, we compute that $f_x(x,y) = 4x^3 - 4y$ and $f_y = 4y^3 - 4x$. Verify that $(0,0)$, $(1,1)$ and $(-1,-1)$ are critical points and classify them (if possible) as either local minima, local maxima or saddle points.

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1. Compute $\frac{\partial}{\partial x}\left(\frac{xy}{x+2y}\right)$

2. Given $f(x,y) = xy + \sin(xy)$, determine $f_x(x,y)$ and $f_{xy}(x,y)$.

3. Given $f(x,y) = 4x^3 - 12xy + 6y^2$, determine the critical points of $f(x,y)$.

4. Given that $f(x, y) = x^4 - 4xy + y^4$, we compute that $f_x(x, y) = 4x^3 - 4y$ and $f_y = 4y^3 - 4x$. Verify that $(0, 0)$, $(1, 1)$ and $(-1, -1)$ are critical points and classify them (if possible) as either local minima, local maxima or saddle points.