Worksheet #13; date: 03/01/2018
MATH 53 Multivariable Calculus

1. *(Stewart 14.3.61)* Verify that the conclusion of Clairaut's Theorem holds, that is, $u_{xy} = u_{yx}$.
$$\cos(x^2 y)$$

2. *(Stewart 14.3.71)* If
$$f(x, y, z) = xy^2 z^3 + \arcsin(x\sqrt{z}),$$
   find f_{xzy}. [Hint: Which order of differentiation is easiest?]

3. *(Stewart 14.3.103)* If
$$f(x, y) = x(x^2 + y^2)^{-3/2} e^{\sin(x^2 y)}$$
   find $f_x(1, 0)$. (Hint: There is a relatively painless way other than finding $f_x(x, y)$ first.)

4. *(Stewart 14.4.13)* Explain why the function is differentiable at the given point. Then find the linearization $L(x, y)$ of the function at that point.
$$f(x, y) = x^2 e^y, \quad (1, 0)$$

5. *(Stewart 14.4.15)* Explain why the function is differentiable at the given point. Then find the linearization $L(x, y)$ of the function at that point.
$$f(x, y) = 4\arctan(xy), \quad (1, 1)$$

6. Where is $\sqrt[3]{xy}$ differentiable?