HW 3  
Math 261, F17  

Please see the course syllabus for details on how to turn in your homework assignments. This one is due at the beginning of your class on FRIDAY, September 22.

1. If $f(x, y, z) = x^2 + \sin(y) - y \ln(z)$, find $f(2, \frac{\pi}{2}, 1)$. Please simplify to a single number.

2. Sketch the domain of $g(x, y) = \sqrt{1 - x - y}$.

3. Let $h(x, y, z) = 3x^2z + z \cos(\pi y - \pi x) + 3e^z$. Determine $\lim_{(x,y,z) \to (1,2,0)} h(x, y, z)$.

4. The function $k(x, y) = \frac{7x^3y^3}{2x^6 + 9y^6}$ has no limit as $(x, y) \to (0, 0)$.

   Show this by finding two paths along which $k(x, y)$ has different limits. Please put a rectangle around each of the two paths you choose and circle the path-dependent limits you find.

5. Compute $\frac{\partial h}{\partial x}$ for the function in #3.