

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 $\lim_{(x,y,z) \rightarrow (1,2,0)} h(x, y, z)$.
4. The function $k(x, y) = \frac{7x^3y^3}{2x^6 + 9y^6}$ has no limit as $(x, y) \rightarrow (0, 0)$.

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.