HW 3
Math 261, F18

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 21**.

1. If \( f(x, y, z) = \sqrt{x^3 + \sin(y) - y \ln(z)} \), find \( f(2, \frac{\pi}{2}, 1) \). Perform elementary simplifications.

2. Sketch the domain of \( g(x, y) = \ln(1 - 2x - 2y) \).

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

4. The function \( k(x, y) = \frac{7x^8 y}{-2x^9 + 9y^9} \) has no limit as \( (x, y) \to (0, 0) \).

   Show this by computing the limit of the function along the two following paths:
   
   (a) \( t \mapsto (t, 0) \).
   
   (b) \( t \mapsto (t, t) \).

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