

Math 212 Spring 2020
 Multivariable Calculus Written HW 4
 Due Wednesday, February 19

1. Give a formula for the local linear approximation to $g(x, y, z) = xy + yz + xz$ near the point $(1, 2, 3)$.
2. Let $\vec{u} = 3\vec{i} + 4\vec{j}$, and let $f(x, y) = xy$. Compute $f_{\vec{u}}$ directly from the limit definition.
3. Below is a contour plot of the function $h(x, y)$.
 - (a) Sketch the gradient vector at $(0, 1)$.
 - (b) Sketch the gradient vector at P .
 - (c) Sketch the gradient vector at Q .
 - (d) Label a point on the diagram where $\frac{\partial h}{\partial x} = 0$.
 - (e) Label a point on the diagram where $\frac{\partial h}{\partial y} = 0$.

