Math 1AA3/1ZB3: Week 12 Tutorial Problems

March 29, 2019

1. Find the tangent plane to $z(x, y) = x^2 e^{xy}$ at $(x, y) = (1, 2)$. Use this to estimate the value $z(1.1, 1.9)$.

2. A rectangular pyramid is measured to have base dimensions $10m$ by $12m$ and a height of $8m$, with each measurement having an error of up to $5cm$. Use differentials to estimate the total error in the volume of the pyramid.

3. Let $z(x, y) = x \sin y - y^2$, where x and y are both functions of u. Compute the value of $\frac{\partial z}{\partial u}$ at $u = 3$ given the following conditions:

   - $x(3) = -1$
   - $y(3) = 2$
   - $\left.\frac{\partial x}{\partial u}\right|_{u=3} = 7$
   - $\left.\frac{\partial y}{\partial u}\right|_{u=3} = 4$