Math 254 ASSIGNMENT 8 ADDENDUM **Due on 4/30**

Give appropriate units with every numerical answer.

3. $T(x, y, z) = 2xz^3 + y^2 + 3yz$ gives temperature, in degrees Celsius, at the point (x, y, z) in a solid object. x, y and z are in centimeters.

   (a) Give the average rate of change of temperature from $(0, 2, 1)$ to $(2, 1, 3)$, **showing clearly how you calculate it**.

   (b) Give each of the following, **labeling with the notation used for it here:**

   $$T_x(x, y, z) \qquad \frac{\partial T}{\partial y} \qquad \frac{\partial^2 T}{\partial x \partial y} \qquad T_{xx}(x, y, z)$$

   (c) Give $\dfrac{\partial T}{\partial z} = T_z(x, y, z)$, then give $\left.\dfrac{\partial T}{\partial z}\right|_{(2,2,1)} = T_z(2, 2, 1)$.

4. Using the same function $T(x, y, z) = 2xz^3 + y^2 + 3yz$, give the average rate of change from $(2, 2, 1)$ to

   (a) $(2, 2, 1.5)$ (b) $(2, 2, 1.1)$ (c) $(2, 2, 1.01)$

   Show clearly how each is obtained, and round to four places past the decimal.