QUIZ 6

(Math 200-Section A)

1. Find the Maclaurin polynomials P_0, P_1, P_2 for $f(x) = e^{3x} + 2x + 1$. (4 pts)
   (*Note*: The Maclaurin polynomials are the Taylor polynomials at $x_0 = 0$)

2. Expand $f(x) = 4x^3 - 3x^2 + 5x - 1$ in powers of $(x - 2)$. What do you observe after the 3^{th} derivative? Explain why is this necessary to happen. (4 pts)

3. Find the Taylor series of $f(x) = \frac{1}{x^2}$ at $x_0 = 1$. Make sure you include the n^{th} - term of the series. (4 pts)

4. Evaluate $\iint_R (x^{1/2} - y^2)dxdy$, where R is the region in the first quadrant bounded by the curves $y = x^2$ and $y = x^{1/4}$. (4 pts)
(*Recall*: The graph of $y = x^{1/4}$ is similar to $y = x^{1/2} = \sqrt{x}$)

5. Find the volume of the region bounded above by the paraboloid $z = x^2 + y^2$ and below by the triangle enclosed by the lines $y = x, x = 0$ and $x + y = 2$ in the xy-plane. (4 pts)