# Advance Calculus MAT201 Assignment 2

Universiti Sains Malaysia

Due: January 18, 6 PM (Monday noon)

Name: _____ Matric No.:_____

Instruction: Answer all questions.

1. A city inside the circle $x^2 + y^2 = 100$ has a population density $\rho(x, y) = 10(100 - x^2 - y^2)$. Perform integration to find its population.

(7 marks)

2. By using a change of variables, display your ability to find correct transformation in finding the area of the region bounded by the curves $y = x^2$, $y = 2x^2$, $y = \dfrac{1}{x}$ and $y = \dfrac{2}{x}$. *(Hint: You can use online plotting tools to help visualizing the region.)*

(10 marks)

3. Explain using spherical coordinate the procedure in obtaining the formula required to compute the volume of a sphere with radius $a$.

(7 marks)