Name: _____
Student ID: _____

Quiz 9

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. *(5 marks)* §7.3 #17
Use the method of cylindrical shells to find the volume generated by rotating the region bounded by the given curves about the specified axis. Sketch the region and a representative rectangle.

$y = x^2,\ y = 0,\ x = 1,\ x = 2;$ about $x = 4$

Question 2. *(2 marks)* §8.1 #6 Find a formula for the general term a_n of the sequence, assuming that the pattern of the first few terms continues.

$$\left\{-\frac{1}{4}, \frac{2}{9}, -\frac{3}{16}, \frac{4}{25}, \ldots\right\}$$

Question 3. *(3 marks)* §8.1 #19 Determine whether the sequence converges or diverges. If it converges, find the limit.

$$\left\{n^2 e^{-n}\right\}$$

Bonus. *(5 marks)* Evaluate the improper integral or show it diverges:

$$\int_{-\infty}^{\infty} \frac{1}{2x^2 - 4x + 4}\, dx$$