

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 #15

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.

$$y = x^2, y = 0, x = 1, x = 2; \text{ about } x = 1$$

Question 2. (2 marks) §8.1 #5 Find a formula for the general term a_n of the sequence, assuming that the pattern of the first few terms continues.

$$\left\{ 1, -\frac{2}{3}, \frac{4}{9}, -\frac{8}{27}, \dots \right\}$$

Question 3. (3 marks) §8.1 #26 Determine whether the sequence converges or diverges. If it converges, find the limit.

$$a_n = \frac{(\ln n)^2}{n}$$

Bonus. (5 marks) Evaluate the indefinite integral:

$$\int \frac{3x^2 + 3x + 2}{x^3 + 2x} dx$$