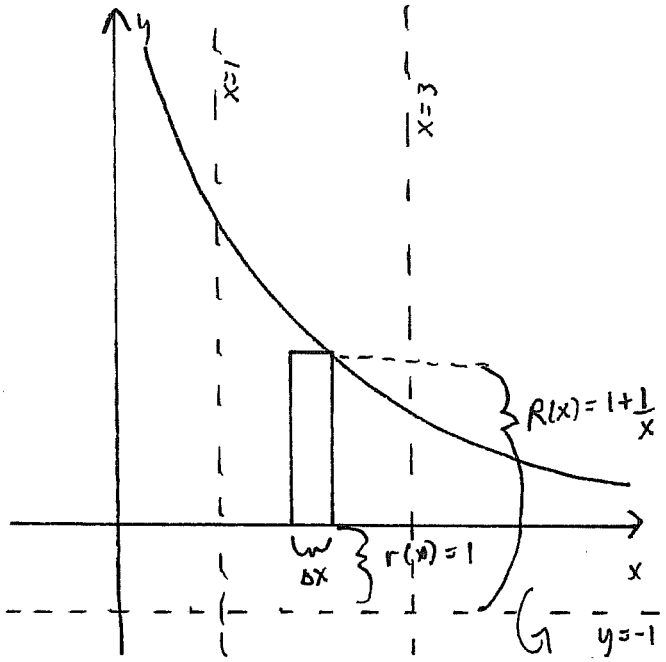
Dawson College: **Calculus II**: 201-NYB-05-S2: Winter 2010

Name: Y. Lamontagne
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)* §7.2 #6 Find the volume of the solid obtained from the region bounded by the graphs of $y = \frac{1}{x}$, $y = 0$, $x = 1$ and $x = 3$, rotated about the line $y = -1$.



$$\therefore \Delta V = \pi \left[\left(1 + \frac{1}{x}\right)^2 - 1^2 \right] \Delta x$$

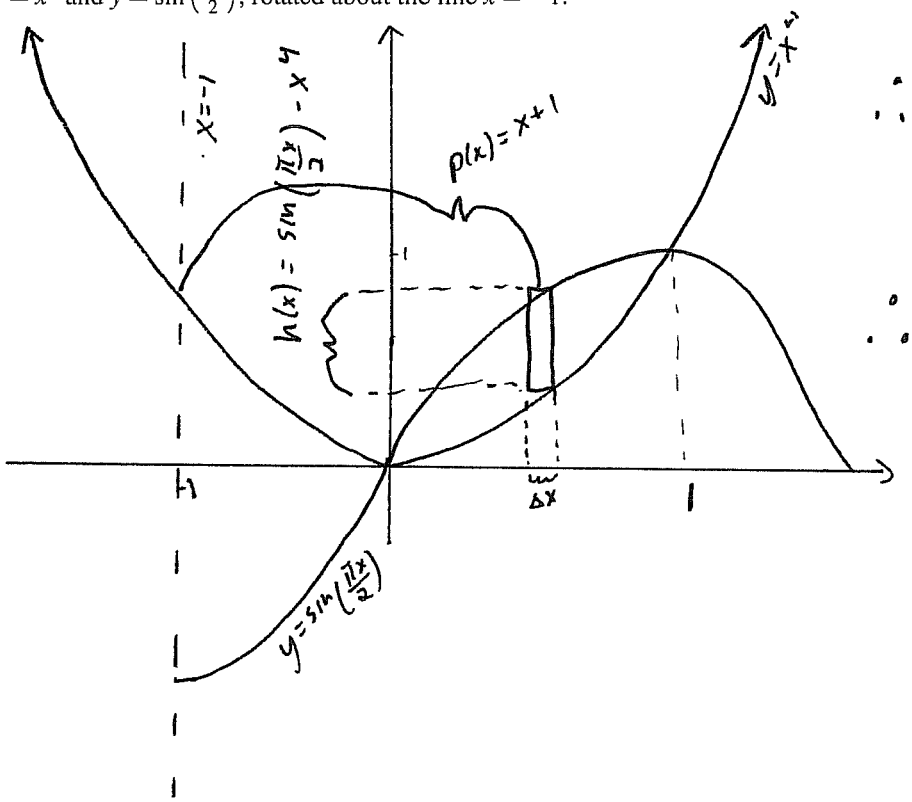
$$= \pi \left[1 + \frac{2}{x} + \frac{1}{x^2} - 1 \right] \Delta x$$

$$V = \int_1^3 \pi \left[\frac{2}{x} + \frac{1}{x^2} \right] dx$$

$$= \left[2\pi \ln|x| - \frac{\pi}{x} \right]_1^3$$

$$= 2\pi \ln 3 - \frac{\pi}{3} + \pi$$

Question 2. *(5 marks)* §7.3 #32 Set up the integral to find the volume of the solid obtained from the region bounded by the graphs of $y = x^4$ and $y = \sin\left(\frac{\pi x}{2}\right)$, rotated about the line $x = -1$.



$$\therefore \Delta V = 2\pi\, p(x) h(x) \Delta x$$

$$= 2\pi (x+1)\left(\sin\left(\frac{\pi x}{2}\right) - x^4 \right) \Delta x$$

$$\therefore V = \int_0^1 2\pi (x+1)\left(\sin\left(\frac{\pi x}{2}\right) - x^4 \right) dx$$