Dawson College: Calculus I: 201-NYA-05-S6: Winter 2009

Name: Y. LAMONTAGNE
Student ID: _____

Quiz 9

This quiz is graded out of 10 marks. No books, 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)* pg. 751 #8 Approximate the value of the integral using trapezoidal rule with $n = 4$.

$$\int_2^6 \frac{1}{x+3}\,dx \approx \frac{\Delta x}{2}\left[f(x_0) + 2f(x_1) + 2f(x_2) + 2f(x_3) + f(x_4)\right]$$

$$= \frac{1}{2}\left[\frac{1}{2+3} + 2\left(\frac{1}{3+3}\right) + 2\left(\frac{1}{4+3}\right) + 2\left(\frac{1}{5+3}\right) + \frac{1}{6+3}\right]$$

$$\approx 0.589$$

$\Delta x = \frac{b-a}{n} = \frac{6-2}{4} = 1$

$x_0 = a + 0\Delta x = 2$
$x_1 = a + 1\Delta x = 3$
$x_2 = a + 2\Delta x = 4$
$x_3 = a + 3\Delta x = 5$
$x_4 = a + 4\Delta x = 6$

Question 2. *(5 marks)* pg. 769 #21 Find the area bounded by the indicated curves.

$y = x^4 - 8x^2 + 16$ and $y = 16 - x^4$

Lets find the intersection of the two curves

$x^4 - 8x^2 + 16 = 16 - x^4$

$2x^4 - 8x^2 = 0$

$2x^2(x^2 - 4) = 0$

$x = 0 \quad x = \pm 2$

	$(-2, 0)$	$(0, 2)$
test point, p	-1	1
$y = 16 - x^4$	15	15
$y = x^4 - 8x^2 + 16$	9	9

$\therefore y = 16 - x^4$ always on top

Easier to do a table to determine which curve is on top.

$$V = \int_{-2}^{2} \text{top curve} - \text{bottom curve}\,dx$$

$$= \int_{-2}^{2} 16 - x^4 - (x^4 - 8x^2 + 16)\,dx$$

$$= \int_{-2}^{2} -2x^4 + 8x^2\,dx = \left[-\frac{2x^5}{5} + \frac{8x^3}{3}\right]_{-2}^{2} = \frac{256}{15}$$