

Dawson College
Mathematics Department
Final Examination
201-NYB-05 CALCULUS II
Tuesday, December 10, 2013
Time: 9:30 – 12:30

Student Name: _____

Student I.D. #: _____

Teacher: _____

Instructors: K. Ameer, M Chaubey, A. Hariton

Instructions

- Print your name and student ID number in the space provided above.
- Attempt all questions.
- All questions are to be answered directly on the examination paper.
- Translation and regular dictionaries are permitted.
- Small, noiseless, NON-PROGRAMMABLE calculators without text storage or graphics capability are permitted.
- This examination consists of 11 questions.
- **Please ensure that you have a complete examination before starting**

Question	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
Total /100	

This exam must be returned intact.

1. [5] Evaluate the following indefinite integrals

a. $\int \frac{x}{\sqrt{x}} dx$

b. [5] ! $\frac{dx}{\sqrt{1 + \sqrt{x}}}$

c. [5] $\tan^3(4) \sec^3(4)$

d. [5] $\int \frac{dx}{x\sqrt{x-}}$

e. [5] $\frac{\sin^3(2x)}{\cos^4(2x)} dx$

f. [5] $\int \frac{x+1}{(x-1)(x^2+1)} dx$

2. [5] Find the area of the region bounded by the curves $y = x^4$ and $y = 8x$

3. [10

4. [5] Find the arch length of the curve given by:

$$x = y - \frac{1}{y}$$

5. [5] Find the average value of $f(x) = \frac{1}{2}x^2 - 3x + 5$ on the interval $[0, \frac{1}{2}]$.

6. [5

7. Determine whether each improper integral converges or diverges. If it converges, find its value.

a. [4] $\int_2^3 \frac{dx}{(x-2)^{1/3}}$

8. [8] Find the sum of the series $\sum_{h=0}^{\infty} \left(\frac{3^{n-1}}{4^{n-1}} - \frac{2 \cdot 3^n}{3} \right)$, {

9. Determine whether each series converges absolutely, converges conditionally, or diverges. State any tests used to reach your conclusions

a. [4] $\sum_{n=1}^{\infty} \frac{(-1)^n + (-1)^{n+1}}{n^2}$

c. [4] $\sum_0^{\infty} (-1)^n \left(\frac{5^{2n} - 7}{7^{2n} - 10} \right)$

d. [4] $\sum_0^5 (-1)^k \frac{5}{(k-1)!}$

$$\text{e. [4]} \quad \frac{\sqrt{n}}{5n^3} \quad n$$

10. [4] Find the Maclaurin series representation of $e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots$

[4] Find the radius and interval of convergence of the power series. Test for the end points also.

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{n!} x^n$$