

DAWSON COLLEGE
Mathematics Department
Final Examination
Calculus II
201-NYB-05 (Commerce)

* WITH ANSWERS *

Student Name _____

Student I.D.# _____

Instructors: Richard Fominer & Shahab Shahabi

TIME: 9:30 am - 12:30 pm

Instructions:

1. Questions II, numbers 1-11, are listed above.
 2. Questions are to be answered directly on this paper in the provided space.
 3. Calculators and dictionaries are not permitted.
 4. Only non-programmable calculators are permitted.
 5. No cell phone storage or use is permitted.
 6. A formula sheet is provided.

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| 1/5 |
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| 18/5 |
| 19/5 |
| 20/5 |
| Total/100 |

- All questions are to be answered in the space provided.
- All questions are to be answered on the examination paper.
- Translation and regular use of a calculator are permitted.
- Small, noiseless and non-programmable calculators without text memory are permitted.

$$\int \frac{1}{x} dx = \ln|x|$$

$$\int x^2 dx = \frac{1}{3} \ln|x^3| + C$$

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

8. [5 marks]. Find the area of the region bounded by the graphs of the functions

$$f(x) = \sqrt[3]{x} \text{ and } g(x) = x^2 \quad : \quad \frac{1}{3}$$

9. [5 marks]. Find the area of the region bounded by the graphs of the functions

$$v = x^2 + 1 \text{ and } v = 3x^2$$

$$\lim_{x \rightarrow \infty} (x^2 + x + 1)$$

$$01(114 x^2)$$

$$\sum_{n=1}^{\infty} \ln(n)$$

14. [10 marks] Use the ratio test to determine if the series converges.

$$\sum_{n=1}^{\infty} \frac{1}{n!}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$

$$\sum_{n=1}^{\infty} \frac{1}{n}$$

$$\sum_{n=1}^{\infty} \left(\frac{1}{2}\right)^{2n+2}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^3}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^4}$$

17. [5 marks] Give an example (with a short justification) of a non-convergent series.

$$\sum_{n=1}^{\infty} \frac{1}{n}$$

$$\sum_{n=1}^{\infty} \frac{1}{n^2}$$