

DAWSON COLLEGE
MATHEMATICS DEPARTMENT

Final Examination

Mathematics 201-203-DW

Calculus II Social Science / Commerce

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Date: Tuesday, December 21, 2010

1. [5 marks] Find \int if

$$f(x) = 4x^5 - 3x^4 + 2x$$

11. [5 marks] Evaluate the integral, if it converges:

$$\int_3^{\infty} \frac{1}{\ln^2 x} dx$$

12. [5 marks] Verify that $y = 2x^2 + 3x$ is a solution to the differential equation

$$2x^2 + 2y = 2x^2 + 2y''$$

13. [5 marks] Use separation of variables to find the particular solution of the differential equation

$$(2x^3 + 3x^2) y' = \frac{72x^2}{(2x + 1)^3}$$

subject to the initial condition $y(1) = 4$.

14. [5 marks] Find the sum of the convergent series:

$$\sum_{n=2}^{\infty} \frac{5 \left(\frac{2}{3} \right)^n}{n^2}$$

15. [15 marks] Determine if each of the following series is convergent or divergent. State the test used.

a.

$$\sum_{n=10}^{\infty} \frac{3 + 4^{n^3} - 18^{n^5}}{2^{n^5} - 7^{n^2} + 10}$$

b.

$$\sum_{n=1}^{\infty} \frac{1}{2 + \sqrt{n^5}}$$

c.

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

Answers

1. $= 4^3 + \frac{4}{\sqrt{\quad}} + 6$

2. Average Value = 9.6395

3. Sales = \$ 249 535.23

4. PS = \$ 90 650

5. 5.25

6. Area = 36 units²

7. a) $\frac{1}{24} x^2 + 3 x^3$

c) convergent by integral test (since $\int_2^{\infty} x^{-2+1} dx = \frac{1}{2} x^{-3}$)