Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
COLLEGE OF COMPUTER STUDIES
MIDTERM EXAMINATION
December 11-13, 2024

Calculus

I. Multiple Choice: Choose the correct answer. Write the letter of the correct answer in the test booklet.

1. $\int(3x^2-2x+3)dx=$

   a. x^3-x^2+c b. $3x^3-x^2+3x+c$ c. x^3-x^2+3x+c

   d. $\frac{1}{2}(3x^2-2x+3)^2+c$ e. none of these

2. $\int(x-\frac{1}{2x})^2dx=$

   a. $\frac{1}{3}(x-\frac{1}{2x})^3+c$ b. $x^2-1+\frac{1}{4x^2}+c$ c. $\frac{x^3}{3}-2x-\frac{1}{4x}+c$

   d. $\frac{x^3}{3}-x-\frac{4}{x}+c$ e. none of these

3. $\int\sqrt{4-2t}\ dt=$

   a. $-\frac{1}{3}(4-2t)^{\frac{3}{2}}+c$ b. $\frac{2}{3}(4-2t)^{\frac{3}{2}}+c$ c. $-\frac{1}{6}(4-2t)^3+c$

   d. $\frac{1}{2}(4-2t)^2+c$ e. $\frac{4}{3}(4-2t)^{\frac{3}{2}}+c$

4. $\int(3x-1)^3dx=$

   a. $\frac{1}{12}(3x-1)^4+c$ b. $-\frac{1}{4}(3x-1)^4+c$ c. $\frac{1}{12}(3x-4)^4+c$

   d. $-\frac{1}{4}(3x-4)^4+c$ e. none of these

5. $\int\frac{1-3y}{\sqrt{2y-3y^2}}\ dy=$

   a. $4\sqrt{2y-3y^2}+c$ b. $\frac{1}{4}(2y-3y^2)^2+c$ c. $\frac{1}{2}ln\sqrt{2y-3y^2}+c$

   d. $\frac{1}{4}(2y-3y^2)^{\frac{1}{2}}+c$ e. $\sqrt{2y-3y^2}+c$

6. $\int\frac{dx}{3(2x-1)^2}=$

   a. $-\frac{3}{2x-1}+c$ b. $\frac{1}{6-12x}+c$ c. $\frac{6}{2x-1}+c$

   d. $\frac{2}{3\sqrt{2x-1}}+c$ e. $\frac{1}{3}ln(2x-1)+c$

7. $\int\frac{2du}{1+3u}=$

   a. $\frac{2}{3}ln(1+3u)+c$ b. $-\frac{1}{3(1+3u)^2}+c$ c. $2ln(1+3u)+c$

   d. $\frac{3}{(1+3u)^2}+c$ e. none of these

8. $\int\frac{t}{\sqrt{2t^2-1}}\ dt=$

   a. $\frac{1}{2}ln\sqrt{2t^2-1}+c$ b. $4ln\sqrt{2t^2-1}+c$ c. $8\sqrt{2t^2-1}+c$

   d. $-\frac{1}{4(2t^2-1)}+c$ e. $\frac{1}{2}\sqrt{2t^2-1}+c$

9. $\int\cos 3x\ dx=$

   a. $3\sin 3x+c$ b. $-\sin 3x+c$ c. $-\frac{1}{3}\sin 3x+c$

   d. $\frac{1}{3}\sin 3x+c$ e. $\frac{1}{2}cos^2x+c$

10. $\int \frac{x}{1+4x^2}\, dx =$

a. $\frac{1}{8}\ln(1+4x^2)+c$ b. $\frac{1}{8(1+4x^2)^2}c$ c. $\frac{1}{4}\sqrt{1+4x^2}+c$

d. $\frac{1}{2}\ln(1+4x^2)+c$ e. $\frac{1}{2}\,tan^{-1}2x+c$

II. Determine the integral of the following:

11. $\int e^{3x}\cos x\, dx$ 12. $\int 2x\sqrt{1+x^2}\, dx$ 13. $\int \frac{4x}{\sqrt{2x^2+1}}dx$

14. $\int \frac{sin\sqrt{x}}{\sqrt{x}}dx$ 15. $\int x\sin(2x)\, dx$ 16. $\int \frac{(x^2-1)^{\frac{3}{2}}}{x}dx$

III. Evaluate each of the following integrals.

17. $\int_1^6 (12x^3-9x^2+2)\, dx$ 18. $\int_{-2}^1 (5x^2-7x+3)\, dx$

19. $\int_0^{\frac{\pi}{2}} (7\, sinx-2\cos x)\, dx$ 20. $\int_{-4}^{-1} x^2(3-4x)\, dx$

Prepared by:

Lowell D. Espinosa