

Assignment 2



Subject: Calculus

Chapter: Unit 3 & 4

Category: Assignment 2

1. Solve using substitution

$$\int_{\frac{1}{50}}^2 \frac{e^{\frac{2}{w}}}{w^2} dw$$

2. Solve using substitution;

$$\int \frac{2t^3+1}{(t^4+2t)^3} dt$$

3. If $f'(x) = x^4+3x-9$ what was $f(x)$?

4. Given,

$$f(x) = \begin{cases} 6 & \text{if } x > 1 \\ 3x^2 & \text{if } x \leq 1 \end{cases}$$

Evaluate the following;

$$\int_{-2}^3 f(x)$$

5. Solve $\int 3(8y - 1)e^{4y^2-y} dy$

6. Find $f(x)$ when;

$$f''(x) = 15\sqrt{x} + 5x^3 + 6, \quad f(1) = \frac{-5}{4}, \quad f(4) = 404$$

7. Formulate the PDE from $f(x + iy) + g(x - iy)$

8. Solve the following

$$\frac{dr}{d\theta} = \frac{r^2}{\theta} \quad r(1) = 2$$

9. Find the solution to the following differential equation.

$$\frac{dv}{dt} = 9.8 - 0.196v$$

10. Find the solution to the following Initial value Problem (IVP).

$$ty' + 2y = t^2 - t + 1 \quad y(1) = \frac{1}{2}$$

11. Solve the following IVP and find the interval of validity of the solution.

$$y' = \frac{xy^3}{\sqrt{1+x^2}} \quad y(0) = -1$$

12. Find the Taylor Series for $f(x) = x^3 - 10x^2 + 6$ for $x = 3$.

13. Find the Maclaurin series for $(1 + x)^\mu$

14. Determine the Maclaurin series for $f(x) = \sqrt{1 + x}$.

15. Find the Taylor Series for $f(x) = e^{-6x}$ about $x = -4$.

16. Find the Taylor Series for $f(x) = \ln(3 + 4x)$ about $x = 0$.

17. Solve $\int \frac{x^4 - 6x^3 + e^x \sqrt{x}}{\sqrt{x}} dx$

18. Find the integrating factor of the differential equation $x(dy/dx) - y = 2x^2$.

19. Find the Taylor Series for $f(x) = \frac{7}{x^4}$ about $x = -3$

20. Find the Maclaurin Series expansion of

$$f(x) = e^x$$