

Section 5-3 : Substitution Rule for Indefinite Integrals

For problems 1 – 31 evaluate the given integral.

1. $\int 12v(7+6v^2)^9 dv$

2. $\int (4x^3 - 12x)(x^4 - 6x^2)^{-3} dx$

3. $\int (z^2 - 4)(12z - z^3)^4 dz$

4. $\int 7z^2(14+8z^3)^{-5} dz$

5. $\int 3(y^6 - 4y^{-3})(y^7 + 14y^{-2} - 7)^6 dy$

6. $\int (\frac{1}{2}x^3 - 1)\sqrt{8x - x^4} dx$

7. $\int (6w^{-4} + 12w^{-7})\sqrt[4]{w^{-3} + w^{-6}} dw$

8. $\int \cos(7t) dt$

9. $\int (v - 2v^3)\cos(v^2 - v^4) dv$

10. $\int \sqrt{z} \sin(1 + \sqrt{z^3}) dz$

11. $\int \csc^2(1 + 2x) dx$

12. $\int 7w^{-5} \sec(w^{-4}) \tan(w^{-4}) dw$

13. $\int (2 - t^2)e^{6t-t^3} dt$

14. $\int 12z^{-2}e^{4+z^{-1}} dz$

15. $\int \frac{1}{4-9w} dw$

16.
$$\int \frac{9y}{y^2 + 3} dy$$

17.
$$\int \frac{6x^2 - 10x^4}{x^5 - x^3} dx$$

18.
$$\int \frac{1}{t} \sin(1 - \ln(t)) dt$$

19.
$$\int [6v - 18 \sin(6v)] \sqrt[3]{v^2 + \cos(6v)} dv$$

20.
$$\int e^{-3z} \sec(e^{-3z}) \tan(e^{-3z}) dz$$

21.
$$\int (\cos(x) + \sin(x)) e^{\sin(x) - \cos(x)} dx$$

22.
$$\int \frac{[\ln(w^2)]^4}{w} dw$$

23.
$$\int \cos(v) \cos(1 + \sin(v)) dv$$

24.
$$\int \frac{y + \sin(2y)}{y^2 - \cos(2y)} dy$$

25.
$$\int \sec^7(t) \tan(t) dt$$

26.
$$\int e^z \sec^2(e^z) [1 + \tan(e^z)]^{-3} dz$$

27.
$$\int \frac{7}{1 + 5x^2} dx$$

28.
$$\int \frac{2}{3 + 4t^2} dt$$

29.
$$\int \frac{1}{\sqrt{16 - y^2}} dy$$

30.
$$\int \frac{3}{\sqrt{7 - 4v^2}} dv$$

31.
$$\int \frac{x}{1+x^4} dx$$

32. Evaluate each of the following integrals.

(a)
$$\int \frac{1}{3+x} dx$$

(b)
$$\int \frac{x}{3+x^2} dx$$

(c)
$$\int \frac{x}{(3+x^2)^7} dx$$

(d)
$$\int \frac{1}{3+x^2} dx$$

33. Evaluate each of the following integrals.

(a)
$$\int \frac{4w}{25+9w^2} dw$$

(b)
$$\int \frac{4w}{(25+9w^2)^3} dw$$

(c)
$$\int \frac{4}{25+9w^2} dw$$

Section 5-4 : More Substitution Rule

Evaluate each of the following integrals.

1. $\int 3x \cos(4-x^2) - 8x\sqrt{4-x^2} \, dx$

2. $\int \frac{4}{(9+6t)^5} + \frac{13}{9+6t} \, dt$

3. $\int (6-5w)e^{12w-5w^2} + (20w-24)\sec^2(12w-5w^2) \, dw$

4. $\int \frac{\sin(1+\ln(2x)) - \sqrt{1+\ln(2x)}}{x} \, dx$

5. $\int 17(xe^x + e^x)\sin(xe^x) - 14\sin(x) \, dx$

6. $\int \frac{1}{3t} + \sec(9t)\tan(9t)e^{\sec(9t)} \, dt$

7. $\int 8w^2 + \frac{\sin(w) + \cos(w)}{\sin(w) - \cos(w)} \, dw$

8. $\int 8 + (3+x^6)\cos(21x+x^7) + 9x^2 - 4\sqrt{x} \, dx$

9. $\int \sin(y)\cos(y)\sqrt{3+\sin^2(y)} + 5e^y \, dy$

10. $\int \sin(2-t) + 8\cos(5t) - e^{3t} \, dt$

11. $\int \frac{4x^2-1}{\sqrt[4]{6x-8x^3}} + 9xe^{x^2} \, dx$

12. $\int z^3 + \sqrt{4-3z} - 4\sec(8z)\tan(8z) \, dz$

13. $\int \frac{17}{6-w} + \sin(w)\sin[1+\cos(w)] \, dw$

Section 5-4 : More Substitution Rule

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Evaluate each of the following integrals.

1. $\int 4\sqrt{5+9t} + 12(5+9t)^7 dt$

2. $\int 7x^3 \cos(2+x^4) - 8x^3 e^{2+x^4} dx$

3. $\int \frac{6e^{7w}}{(1-8e^{7w})^3} + \frac{14e^{7w}}{1-8e^{7w}} dw$

4. $\int x^4 - 7x^5 \cos(2x^6 + 3) dx$

5. $\int e^z + \frac{4 \sin(8z)}{1+9 \cos(8z)} dz$

6. $\int 20e^{2-8w} \sqrt{1+e^{2-8w}} + 7w^3 - 6 \sqrt[3]{w} dw$

7. $\int (4+7t)^3 - 9t \sqrt[4]{5t^2+3} dt$

8. $\int \frac{6x-x^2}{x^3-9x^2+8} - \csc^2\left(\frac{3x}{2}\right) dx$

9. $\int 7(3y+2)(4y+3y^2)^3 + \sin(3+8y) dy$

10. $\int \sec^2(2t)[9+7 \tan(2t) - \tan^2(2t)] dt$

11. $\int \frac{8-w}{4w^2+9} dw$

12. $\int \frac{7x+2}{\sqrt{1-25x^2}} dx$

13. $\int z^7 (8+3z^4)^8 dz$