

Worksheet 15  
[Tutorial Worksheet on Integration]

Determine each of the following integrals:

1.  $\int \cos 3x dx$

2.  $\int \cos^2 x dx$

3.  $\int \sin^2 x \cos^2 x dx$

4.  $\int \sin^2 x \cos^3 x dx$

5.  $\int \tan x dx$

6.  $\int \cot x dx$

7.  $\int \csc x dx$

8.  $\int \sin^3 x \cos^5 x dx$

9.  $\int \frac{\cos \theta}{1 + \cos \theta} d\theta$

10.  $\int \frac{\sin \theta}{1 - \sin \theta} d\theta$

11.  $\int \sin x \sin 2x dx$

12.  $\int e^{3x} dx$

13.  $\int x^3 e^{x^4} dx$

14.  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

15.  $\int \frac{x^3}{(4 - x^4)^3} dx$

16.  $\int \frac{\sin \sqrt{\theta}}{\sqrt{\theta} \cos^3 \sqrt{\theta}} d\theta$

17.  $\int \sec^2 x \tan^2 x dx$

18.  $\int \cot^7 x \csc^2 x dx$

19.  $\int \frac{\cos x}{1 - \sin x} dx$

20.  $\int \frac{e^x}{1 + e^x} dx$

21.  $\int \frac{e^x + e^{-x}}{e^x - e^{-x}} dx$

22.  $\int \sec^2 x \tan x dx$

23.  $\int \sin x \cos x dx$

24.  $\int \sqrt{3 - 4x} dx$

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$$\int \frac{y^2 + 4y - 4}{\sqrt{y^3 + 6y^2 - 12y + 9}} dy$$

$$25. \int \frac{2 + \ln x}{x + x \ln x} dx$$

$$26. \int \sin^2 x dx$$

$$27. \int \cos^2 x dx$$

$$28. \int \sin^3 x \cos^2 x dx$$

$$29. \int \cos^3 x dx$$

$$30. \int \frac{2x^3 + 3x^2 - 4x}{x^4 + 2x^3 - 4x^2 + 5} dx$$

$$31. \int \frac{\left(1 + t^{\frac{2}{3}}\right)^3}{t^{\frac{1}{3}}} dt$$

$$32. \int \tan^3 x \sec^3 x dx$$

$$33. \int \cos(2x) e^{(\sin 2x)} dx$$

$$34. \int (x - 1) \sqrt{x + 1} dx$$

$$35. \int x \sqrt{2 - 3x} dx$$

$$36. \int (\sec^4 x - \sec^2 x \tan^2 x) dx$$

$$37. \int e^{\cot 3x} \csc^2 3x dx$$

$$38. \int \frac{e^{\ln x}}{x} dx$$

$$39. \int \cot^2 x dx$$

$$40. \int \tan^2 x dx$$

$$41. \int \tan x dx$$

$$42. \int \cot 4x dx$$

$$43. \int (\sec^2 x - \tan^2 x) dx$$

$$44. \int (\csc^2 x - \cot^2 x) dx$$

$$45. \int \frac{x}{\sqrt{x^2 + 1}} dx$$

$$46. \int x^3 \sqrt{1 - x^2} dx$$

$$47. \int \sqrt{x} \sin\left(1 + x^{\frac{3}{2}}\right) dx$$

$$48. \int \frac{ax + b}{\sqrt{ax^2 + 2bx + c}} dx$$

$$49. \int \frac{\sec\theta \tan\theta}{1 + \sec\theta} dx$$