List of Integration Formulaes

1. $\int x^n \, dx = \frac{x^{n+1}}{n+1}, \quad n \neq -1$

2. $\int \frac{1}{x} dx = \log x$

3. $\int e^x \, dx = e^x$

4. $\int \sin x \, dx = -\cos x$

5. $\int \cos x \, dx = \sin x$

6. $\int \sec^2 x \, dx = \tan x$

7. $\int \operatorname{cosec}^2 x \, dx = -\cot x$

8. $\int \sec x \cdot \tan x \, dx = \sec x$

9. $\int \operatorname{cosec} x \cdot \cot x \, dx = -\operatorname{cosec} x$

10. $\int \tan x \, dx = \log \sec x = -\log \cos x$

11. $\int \operatorname{cosec} x \, dx = \log \tan \frac{x}{2} = \log(\operatorname{cosec} x - \cot x)$

12. $\int \sec x \, dx = \log \tan\left(\frac{\pi}{4} + \frac{x}{2}\right) = \log(\sec x + \tan x)$

13. $\int \frac{dx}{x^2+a^2} = \frac{1}{a} \tan^{-1} \frac{x}{a}$

14. $\int \frac{dx}{x^2-a^2} = \frac{1}{2a} \log \frac{x-a}{x+a}, \quad x > a.$

15. $\int \frac{dx}{a^2-x^2} = \frac{1}{2a} \log \frac{a+x}{a-x}, \quad x < a.$

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

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

18. $\int \frac{dx}{(a^2+x^2)^{1/2}} = \log\{x+(x^2+a^2)\}^{1/2} = \sinh^{-1}\frac{x}{a}$.

19. $\int \frac{dx}{(x^2-a^2)^{1/2}} = \log\{x+(x^2-a^2)\}^{1/2} = \cosh^{-1}\frac{x}{a}$.

20. $\int \cos(ax+b)dx = \frac{\sin(ax+b)}{a}$

21. $\int e^{ax+b}\,dx = \frac{e^{ax+b}}{a}$

22. $\int e^{ax}.\sin bx\,dx = \frac{e^{ax}}{a^2+b^2}[a\sin bx - b\cos bx]$

23. $\int e^{ax}.\cos bx\,dx = \frac{e^{ax}}{a^2+b^2}[a\cos bx + b\sin bx]$

24. $\int e^{ax}.\sin(bx+c)\,dx = \frac{e^{ax}}{a^2+b^2}[a\sin(bx+c) - b\cos(bx+c)]$

25. $\int e^{ax}.\cos(bx+c)\,dx = \frac{e^{ax}}{a^2+b^2}[a\cos(bx+c) + b\sin(bx+c)]$

Integration by parts:

$$\int f_1(x).f_2(x)\,dx = f_1(x)\left\{\int f_2(x)\,dx\right\} - \int\left\{\frac{d}{dx}f_1(x)\right\}\left\{\int f_2(x)\,dx\right\}dx$$