

Formulae Integration for Competitive Exams

$$1. \int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$2. \int \cos x dx = \sin x + C$$

$$3. \int \sin x dx = -\cos x + C$$

$$4. \int \sec^2 x dx = \tan x + C$$

$$5. \int \operatorname{cosec}^2 x dx = -\cot x + C$$

$$6. \int \sec x \times \tan x dx = \sec x + C$$

$$7. \int \operatorname{cosec} x \times \cot x dx = -\operatorname{cosec} x + C$$

$$8. \int \frac{1}{\sqrt{1-x^2}} dx = \sin^{-1} x + C$$

$$9. \int \frac{-1}{\sqrt{1-x^2}} dx = \cos^{-1} x + C$$

$$10. \int \frac{1}{1+x^2} dx = \tan^{-1} x + C$$

$$11. \int \frac{-1}{1+x^2} dx = \cot^{-1} x + C$$

$$12. \int \frac{1}{x \times \sqrt{x^2-1}} dx = \sec^{-1} x + C$$

$$13. \int \frac{-1}{x \times \sqrt{x^2-1}} dx = \operatorname{cosec}^{-1} + C$$

$$14. \int \frac{1}{x^2-a^2} dx = \frac{1}{2a} \log \left| \frac{x-a}{x+a} \right| + C$$

Visit examrace.com for free study material, doorsteptutor.com for questions with detailed explanations, and "Examrace" YouTube channel for free videos lectures

$$15. \int \frac{1}{a^2 - x^2} dx = \frac{1}{2a} \log \left| \frac{a+x}{a-x} \right| + C$$

$$16. \int \frac{1}{x^2 + a^2} dx = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$$

$$17. \int \frac{1}{\sqrt{a^2 - x^2}} dx = \sin^{-1} \frac{x}{a} + C$$

$$18. \int \frac{1}{\sqrt{x^2 + a^2}} dx = \log \left| x + \sqrt{x^2 + a^2} \right| + C$$

$$19. \int \frac{1}{\sqrt{x^2 - a^2}} dx = \log \left| x + \sqrt{x^2 - a^2} \right| + C$$

$$20. \int \tan x dx = \log |\sec x| + C$$

$$21. \int \cot x dx = \log |\sin x| + C$$

$$22. \int \sec x dx = \log |\sec x + \tan x| + C$$

$$23. \int \operatorname{cosec} x dx = \log |\operatorname{cosec} x - \cot x| + C$$

$$24. \int e^x dx = e^x + C$$

$$25. \int a^x dx = \frac{a^x}{\log a} + C$$

$$26. \int \sqrt{x^2 - a^2} dx = \frac{x}{2} \sqrt{x^2 - a^2} - \frac{a^2}{2} \log \left| x + \sqrt{x^2 - a^2} \right| + C$$

$$27. \int \sqrt{x^2 + a^2} dx = \frac{x}{2} \sqrt{x^2 + a^2} + \frac{a^2}{2} \log \left| x + \sqrt{x^2 + a^2} \right| + C$$

$$28. \int \sqrt{a^2 - x^2} dx = \frac{x}{2} \sqrt{a^2 - x^2} + \frac{a^2}{2} \sin^{-1} \frac{x}{a} + C$$

1. Cone

$$\text{volume} = \frac{1}{3} \pi r^2 h$$

$$\text{CSA} = \pi r l$$

$$\text{TSA} = \pi r l + \pi r^2$$

2. Cylinder

$$\text{volume} = \pi r^2 h$$

$$\text{CSA} = 2\pi rh$$

$$\text{TSA} = 2\pi rh + 2\pi r^2$$

3. Sphere

$$\text{volume} = \frac{4}{3}\pi r^3 = \frac{1}{6}\pi d^3$$

$$\text{TSA} = 4\pi r^2 = \pi d^2$$

4. Cuboid

$$\text{volume} = l \times b \times h$$

$$\text{CSA} = 2(l + b) \times h$$

$$\text{TSA} = 2(lb + bh + hl)$$

5. Circle

$$\text{Circumference} = 2\pi r$$

$$\text{Area} = \pi r^2$$

6. Rectangle

$$\text{Area} = l \times b$$

$$\text{Perimeter} = 2(l + b)$$

7. Square

$$\text{Area} = a^2$$

$$\text{Perimeter} = 4a$$

8. Cube

$$\text{volume} = a^3$$

$$\text{CSA} = 4a^2$$

$$\text{TAS} = 6a^2$$