GALAXY TUTORIALS

CONTACT : RAKESH (DIRECTOR) M: 9311337900

INDEFINITE INTEGRATE

Some important question

Evaluate

1. $\int \sin^2 x\, dx$
2. $\int \cos^2 x\, dx$
3. $\int \tan x \sec^2 x\, dx$
4. $\int \sin x \cos x\, dx$
5. $\int \sin^3 x$
6. $\int \cos^3 x$
7. $\int \sin^2 x \cos x\, dx$
8. $\int \log x\, dx$
9. $\int \sec^3 x\, dx$
10. $\int \operatorname{cosec}^3 x\, dx$
11. $\int x \sin^{-1} x\, dx$
12. $\int \frac{x \cos^{-1} x}{\sqrt{1 - x^2}} dx$
13. $\int \sin^{-1} \sqrt{\frac{x}{a + x}}\, dx$
14. $\int e^x (\sin x + \cos x)\, dx$
15. $\int e^x \frac{x}{(x + 1)^2}\, dx$
16. $\int e^x \left(\frac{1 + \sin x}{1 + \cos x}\right) dx$
17. $\int e^x \sin x\, dx$
18. $\int e^{2x} \cos x\, dx$
19. $\int \frac{dx}{1 + \sin x + \cos x}$
20. $\int \frac{dx}{1 + \sin x}$
21. $\int \frac{dx}{1 + \cos x}$
22. $\int \frac{dx}{\sin^2 x + 3 \cos^2 x}$
23. $\int \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$
24. $\int \frac{\sin x - \cos x}{\sqrt{\sin 2x}} dx$
25. $\int \sin x \cos 2x\, dx$
26. $\int \sin x \cos 3x \cos 2x\, dx$
27. $\int \frac{x^3 + x^2 + 1}{x + 1} dx$
28. $\int \frac{x^2 + 3x + 5}{x^2 + 2x + 5} dx$
29. $\int \frac{1}{x^2 + 3x + 2} dx$
30. $\int \frac{x + 1}{x^2 + 3x + 2} dx$
31. $\int \frac{3x + 2}{5x^2 + 2x - 5} dx$
32. $\int \frac{x}{(x - 1)(x + 2)(x + 3)}$
33. $\int \frac{1}{(x + 2)(x^2 + 3)}$
34. $\int \frac{1}{(x + 1)(x - 1)^2}$
35. $\int \frac{\cos^3 x}{\sqrt{\sin x}} dx$

TYPE – 2

GALAXY TUTORIALS

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INDEFINITE INTEGRATE

1. $\int \frac{1}{4 + 9x^2}\, dx$

2. $\int \frac{1}{\sqrt{9 - 25x^2}}\, dx$

3. $\int \frac{x^4}{x^2 + 1}\, dx$

4. $\int \frac{1}{2x^2 + x - 1}\, dx$

5. $\int \frac{1}{3 + 2x - x^2}\, dx$

6. $\int \frac{1}{x\,(x^n + 1)}\, dx$

7. $\int \frac{\sin x}{1 + \cos^2 x}\, dx$

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

9. $\int \frac{1}{\sqrt{(x - 1)\,(x - 2)}}\, dx$

10. $\int \frac{1}{\sqrt{9 + 8x - x^2}}\, dx$

11. $\int \frac{2x}{\sqrt{1 - x^2 - x^4}}\, dx$

12. $\int \sqrt{\sec x - 1}\ dx$

13. $\int \frac{4x + 1}{x^2 + 3x + 2}\ dx$

14. $\int \frac{2x - 3}{x^2 + 3x - 18}\, dx$

15. $\int \frac{x^3 + x + 1}{x^2 - 1}\ dx$

16. $\int \frac{(3 \sin x - 2) \cos x}{5 - \cos^2 x - 4 \sin x}\, dx$

17. $\int \frac{x^2 + 5x + 3}{x^2 + 3x + 2}\, dx$

18. $\int \sqrt{\frac{a - x}{a + x}}\ dx$

19. $\int \frac{1}{a^2 \sin^2 x + b2 \cos^2 x}\, dx$

20. $\int \frac{\sin 2x}{\sin^4 x + \cos^4 x}\ dx$

21. $\int \frac{1}{1 + \sin x + \cos x}\, dx$

22. $\int \frac{1 + \sin x}{\sin x\,(1 + \cos x)}\ dx$

23. $\int \frac{\sin^{-1}\sqrt{x} - \cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x} + \cos^{-1}\sqrt{x}}\ dx$

24. $\int \frac{\sqrt{x^2 + 1}\,[\log (x^2 + 1) - 2 \log x]}{x^4}\ dx$

25. $\int \frac{x^2}{(x \sin x + \cos x)^2}\ dx$

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TYPE – 3

GALAXY TUTORIALS

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Some Important Question

Evaluate

1. $\int \frac{1}{\sin(x-a)\sin(x-b)}\,dx$ **2.** $\int \frac{1}{\sin(x-a)\cos(x-b)}\,dx$ **3.** $\int \frac{1}{\sin(x-a)\cos(x-b)}\,dx$ **4.** $\int \frac{\sin(x+a)}{\sin(x+b)}\,dx$

5. $\int \frac{1}{\sqrt{\sin^3 x \sin(x+\alpha)}}\,dx,\ \alpha \neq n\pi,\ n \in Z$ **6.** $\int 2^{2^{2^x}}\,2^{2^x}\,2^x\,dx$ **7.** $\int \frac{x^5}{x+1}\,dx$ **8.** $\int \frac{1}{x^{1/2}+x^{1/3}}dx$

9. $\int \frac{1}{x(x^n+1)}\,dx$ **10.** $\int \frac{1}{x(x^5+1)}\,dx$ **11.** $\int \frac{1}{\sqrt{1-e^{2x}}}\,dx$ **12.** $\int \sqrt{\frac{\sin(x-\alpha)}{\sin(x+\alpha)}}\,dx$

13. $\int \frac{x^3+x+1}{x^2-1}\,dx$ **14.** $\int \frac{x^2+5x+3}{x^2+3x+2}dx$ **15.** $\int \sqrt{\frac{a-x}{a+x}}\,dx$ **16.** $\int x\sqrt{\frac{a^2-x^2}{a^2+x^2}}\,dx$

17. $\int \frac{\sin 2x}{\sin^4 x+\cos^4 x}dx$ **18.** $\int \frac{1}{\cos x(\sin x+2\cos x)}\,dx$ **19.** $\int \frac{1}{1+\sin x+\cos x}\,dx$ **20.** $\int \frac{1+\sin x}{\sin x(1+\cos x)}\,dx$

21. $\int \frac{3\sin x+2\cos x}{3\cos x+2\sin x}dx$ **22.** $\int \frac{1}{1+\tan x}\,dx$ **23.** $\int \frac{1}{1+\cot x}\,dx$ **24.** $\int \frac{x-\sin x}{1-\cos x}dx$

25. $\int \frac{\sin^{-1}x}{(1-x^2)^{3/2}}\,dx$ **26.** $\int \frac{\sin^{-1}\sqrt{x}-\cos^{-1}\sqrt{x}}{\sin^{-1}\sqrt{x}+\cos^{-1}\sqrt{x}}\,dx$ **27.** $\int \frac{\sqrt{x^2+1}\,[\log(x^2+1)-2\log x]}{x^4}\,dx$

28. $\int \frac{x^2}{(x\sin x+\cos x)^2}dx$ **29.** $\int \frac{x^2\tan^{-1}x}{1+x^2}\,dx$ **30.** $\int \sin^{-1}\sqrt{\frac{x}{a+x}}\,dx$ **31.** $\int e^x\left(\frac{1}{x}-\frac{1}{x^2}\right)dx$

32. $\int e^x\,\frac{x}{(x+1)^2}dx$ **33.** $\int e^x\left(\frac{2+\sin 2x}{1+\cos 2x}\right)dx$ **34.** $\int \{\sin(\log x)+\cos(\log x)\}dx$

35. $\int e^x\,\frac{x^2+1}{(x+1)^2}dx$ **36.** $\int \frac{\log x}{(1+\log x)^2}\,dx$ **37.** $\int e^x\left(\frac{1+\sin x\cos x}{\cos^2 x}\right)dx$

38. $\int \left\{\log(\log x)+\frac{1}{(\log x)^2}\right\}dx$ **39.** $\int e^{2x}\left(\frac{1+\sin 2x}{1+\cos 2x}\right)dx$ **40.** $\int e^x \sin 3x\,dx$ **41.** $\int \sqrt{\frac{1-\sqrt{x}}{1+\sqrt{x}}}\,dx$

42. $\int \frac{\tan\theta+\tan^3\theta}{1+\tan^3\theta}\,d\theta$ **43.** $\int \frac{\sin x}{\sin 4x}\,dx$ **44.** $\int \frac{x^2+1}{x^4+1}dx$ **45.** $\int \frac{x^2-1}{x^4+x^2+1}dx$

46. $\int \frac{1}{x^4+1}\,dx$ **47.** $\int \sqrt{\tan\theta}\,d\theta$ **48.** $\int \sqrt{\tan\theta}+\sqrt{\cot\theta}\,d\theta$ **49.** $\int \frac{1}{\sin^4 x+\cos^4 x}\,dx$

50. $\int \frac{x^2-3x+1}{x^4+x^2+1}dx$

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ANSWER

1. $I = \operatorname{cosec}(a-b).\log\left|\frac{\sin(x-a)}{\sin(x-b)}\right| + C$ **2.** $I = \frac{1}{\cos(a-b)}\log_e\left|\frac{\sin(x-a)}{\cos(x-b)}\right| + C$ **3.** $I = \frac{1}{\sin(a-b)}\log_e\left|\frac{\sin(x-a)}{\cos(x-b)}\right| + C$

4. $I = (x+b)\cos(a-b) + \sin(a-b)\log|\sin(x+b)| + C$ **5.** $I = -2\operatorname{cosec}\alpha\,(\cos\alpha + \cot x \sin\alpha)^{1/2} + C$

6. $I = \frac{1}{(\log 2)^3}\,2^{2^{2^x}} + C$ **7.** $I = 1/5(x+1)^5 - 5/4(x+1)^4 + 10/3(x+1)^3 - 5(x+1)^2 + 5(x+1) - \log|x+1| + C$

8. $I = 2\sqrt{x} - 3x^{1/3} + 6x^{1/6} - 6\log|x^{1/6}+1| + C$ **9.** $1/n\log\left|\frac{x^n}{(x^n+1)}\right| + C$ **10.** $1/5\log\left|\frac{x^5}{(x^5+1)}\right| + C$

11. $-\log|e^{-x} + \sqrt{e^{-2x}-1}| + C$ **12.** $I = -\cos\alpha.\sin^{-1}\left(\frac{\cos x}{\cos\alpha}\right) - \sin\alpha.\log|\sin x + \sqrt{\sin^2 x - \sin^2\alpha}| + C$

13. $x^2/2 + \log|x^2-1| + 1/2\log\left|\frac{x-1}{x+1}\right| + C$ **14.** $I = x + \log|x^2+3x+2| - 2\log\left|\frac{x-1}{x+2}\right| + C$

15. $a\sin^{-1}(x/a) + \sqrt{a^2-x^2} + C$ **16.** $I = 1/2\,a^2\sin^{-1}(x^2/a^2) + 1/2\sqrt{a^4-x^4} + C$ **17.** $\tan^{-1}(\tan^2 x) + C$

18. $\log|\tan x + 2| + C$ **19.** $\log|\tan x/2 + 1| + C$ **20.** $I = 1/2\left\{\log|\tan x/2| + \frac{\tan^2 x/2}{2} + 2\tan x/2\right\} + C$

21. $\frac{12}{13}x + \frac{-5}{13}\log|3\cos x + 2\sin x| + C$ **22.** $I = \frac{1}{2}x + \frac{1}{2}\log|\sin x + \cos x| + C$

23. $I = -(1/2)\log|\sin x + \cos x| + (1/2)x + C$ **24.** $I = -x\cot x/2 + C$

25. $I = \frac{x}{\sqrt{1-x^2}}\sin^{-1}x + 1/2\log|1-x^2| + C$ **26.** $I = 2/\pi\{\sqrt{x-x^2} - (1-2x)\sin - 1\sqrt{x}\} - x + C$

27. $I = -\frac{1}{3}\left(1+\frac{1}{x^2}\right)^{3/2}\left\{\log\left(1+\frac{1}{x^2}\right) - \frac{2}{3}\right\} + C$ **28.** $I = \frac{(\sin x - x\cos x)}{x\sin x + \cos x} + C$

29. $x\tan^{-1}x - 1/2\log|1+x^2| - 1/2(\tan^{-1}x)^2 + C$ **30.** $x\tan^{-1}\sqrt{x/a} - \sqrt{ax} + a\tan^{-1}\sqrt{x/a} + C$ **31.** $\frac{1}{x}e^x + C$

32. $\frac{x}{(\log x+1)} + C$ **33.** $e^x\tan x + C$ **34.** $x\sin(\log x) + C$ **35.** $e^x - 2 + \frac{e^x}{x+1} + C$

36. $\frac{x}{(\log x+1)} + C$ **37.** $e^x\tan x + C$ **38.** $x\log(\log x)\,k - \frac{x}{\log x} + C$ **39.** $\frac{1}{2}e^{2x}\tan x + C$

40. $I = \frac{e^{2x}}{13}(2\sin 3x - 3\cos 3x) + C$ **41.** $I = (1-x)(\sqrt{x}-2) - \sin^{-1}\sqrt{x} + C$

42. $I = -\frac{1}{3}\log|1+\tan\theta| + \frac{1}{6}\log|\tan^2\theta - \tan\theta + 1| + \frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{2\tan\theta - 1}{\sqrt{3}}\right) + C$

43. $I = -\frac{1}{8}\log\left|\frac{1+\sin x}{1-\sin x}\right| + \frac{1}{4\sqrt{2}}\log\left|\frac{1+\sqrt{2}\sin x}{1-\sqrt{2}\sin x}\right| + C$ **44.** $I = \frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^2-1}{\sqrt{2}x}\right) + C$

45. $I = \frac{1}{2}\log\frac{x^2-x+1}{x^2+x+1} + C$ **46.** $I = \frac{1}{2\sqrt{2}}\tan^{-1}\left(\frac{x^2-1}{\sqrt{2}\,x}\right) - \frac{1}{4\sqrt{2}}\log\left|\frac{x^2-\sqrt{2}\,x+1}{x^2+x\sqrt{2}+1}\right| + C$

47. $I = \frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{\tan\theta - 1}{\sqrt{2}\tan\theta}\right) + \frac{1}{2\sqrt{2}}\log\left|\frac{\tan\theta - \sqrt{2\tan\theta} + 1}{\tan\theta + \sqrt{2\tan\theta} + 1}\right| + C$ **48.** $\sqrt{2}\tan^{-1}\left\{\frac{\tan\theta - 1}{\sqrt{2\tan\theta}}\right\} + C$

49. $I = \frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{\tan^2 x - 1}{\sqrt{2}\tan x}\right) + C$ **50.** $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{x^2-1}{\sqrt{3}\,x}\right) + \frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right) + C$