Career Makers

Assignment
+2Class

It's all about believing
Topic:- Indefinite Integrals

1 $\int (3x+5)\sqrt{4x-1}dx$

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

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

4 $\int \frac{\sin 2x}{a^2\cos^2 x + b^2 \sin^2 x}dx (a^2 \neq b^2)$

5 $\int \frac{1}{e^x - 1}dx$

6 $\int \frac{e^{x-1} + x^{e-1}}{e^x + x^e}dx$

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

8 $\int \frac{\cos 2x}{\cos x}dx$

9 $\int \frac{dx}{\cos x - \sin x}$

10 $\int \frac{d\theta}{(\cos\theta + \sqrt{3}\sin\theta)^2}$

11 $\int \frac{x^4+1}{x^2-9}dx$

12 $\int (\tan 1/x/x)^2 dx$

13 $\int \frac{\sin^2(e^{\sqrt{x}})e^{\sqrt{x}}}{\sqrt{x}}dx$

14 $\int \sin^4 x \cos^2 x dx$

15 $\int \frac{\sqrt{x}}{\sqrt{a^3 - x^3}}dx$

16 $\int \frac{1}{x\sqrt{x^5-4}}dx$ **[Hint.Putx$^{5/2}$=t]**

17 $\int \frac{\sin 2x}{(a+b\cos x)^2}dx$

18 $\int \sqrt{\sec x - 1}dx$

19 $\int \frac{\cos x}{(\cos\frac{x}{2} + \sin\frac{x}{2})^5}dx$

20 $\int \frac{x^2}{\sqrt{x-1}}dx$ **21** $\int \frac{x}{1+\sqrt{x}}dx$

22 $\int \sqrt{e^x - 1}dx$

23 $\int \sec^4 x dx$

24 $\int \tan^3 x dx$

25 $\int \frac{\sec x}{\log(\sec x + \tan x)}dx$

26 $\int \frac{x^3}{(1-x^2)^{3/2}}dx$ **27** $\int \frac{\sqrt{a^2 - x^2}}{x^2}dx$

28 $\int \frac{1}{1+\cos x + \sin x}dx$

29 $\int \frac{\cos x - \sin x}{\sqrt{\sin 2x}}dx$

30 $\int \frac{\cos x + \sin x}{\sqrt{\sin 2x}}dx$

31 $\int \tan^{-1}\sqrt{x}dx$

32 $\int x(\tan^{-1}x)^2 dx$

33 $\int \frac{x\sin^{-1}x^2}{\sqrt{1-x^4}}dx$

34 $\int \sin^{-1}\left(\frac{2x}{1+x^2}\right)dx$

35 $\int si\,n^{-1}\sqrt{\frac{x}{a+x}}dx$ **Hint: - x =a tan^2**

36 $\int \sec^{-1}\sqrt{x}dx$

37 $\int \cos 2x \log\left(\frac{\cos x + \sin x}{\cos x - \sin x}\right)dx$

38 $\int \frac{x+\sin x}{1+\cos x}dx$

39 $\int \frac{\log x}{(1+\log x)^2}dx$

40 $\int \frac{1}{x^4+1}dx$

41 $\int \frac{d\theta}{\sin^4\theta + \cos^4\theta}$

42 $\int \frac{x^2+1}{x^4+1}dx$

43 $\int \frac{1}{(x-3)\sqrt{x+1}}dx$

44 $\int \frac{x^2}{(x\sin x + \cos x)^2}dx$

45 $\int \frac{(3\sin\phi - 2)\cos\phi}{5 - \cos^2\phi - 4\sin\phi}d\phi$

46 $\int e^{\tan^{-1}x}\left(\frac{1+x+x^2}{1+x^2}\right)dx$

47 Evaluate:
$\int \frac{1}{\sin^4 x + \sin^2 x\cos^2 x + \cos^4 x}dx$

48 Evaluate: $\int \frac{x+2}{\sqrt{x^2+5x+6}}dx$ **.**

49 $\int \frac{\cos(x+a)}{\sin(x+b)}dx$

50 $\int \frac{\sin x + \cos x}{\sqrt{9+16\sin 2x}}dx$

51 $\int \tan x \tan 2x \tan 3x\, dx$

52 $\int \sqrt{2ax - x^2}dx$

53 $\int \frac{\tan\theta + \tan^3\theta}{1+\tan^3\theta}d\theta$

54 $\int \frac{x^2+a^2}{x^4+a^4}dx$

55 $\int \frac{\tan x}{\sec x + \cos x}dx$

56. Evaluate $\int \frac{dx}{\sqrt{(x-\alpha)(x-\beta)}}, \beta > \alpha$

57. Evaluate $\int \tan^8 x \sec^4 x dx$

58. Find $\int \frac{x^3}{x^4+3x^2+2}dx$

59. Find $\int \frac{dx}{2\sin^2 x + 5\cos^2 x}$

60. Find $\int x^2 \tan^{-1}x dx$

61. Evaluate $\int \frac{x^2 dx}{x^4 + x^2 - 2}$

62. Evaluate $\int \frac{x^3+x}{x^4-9}dx$

63. Evaluate (i) $\int \sqrt{\frac{a+x}{a-x}}$

64. Evaluate $\int \frac{(\cos 5x + \cos 4x)}{1 - 2\cos 3x}dx$

65. Evaluate $\int \sqrt{5 - 2x + x^2}dx$

66. Evaluate $\int \frac{x^2}{1-x^4}dx$ **put** $x^2 = t$

67. Evaluate $\int \frac{\sin^{-1}x}{(1-x^2)^{\frac{3}{2}}}dx$

68. Evaluate $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x\cos^2 x}dx$

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69. Evaluate $\int \frac{\sqrt{x}}{\sqrt{a^3-x^3}}dx$ **70. Evaluate** $\int \frac{\cos x-\cos 2x}{1-\cos x}dx$

Answer

1. $\frac{3}{40}$ **(4x-1)$^{5/2}$+23/24(4x-1)$^{3/2}$+c** **2. x^3/3-x^2/2+x-log|1-x|+c** **3. -2/5cos^{5}x+c**

4. 1/b^2-a^{2}log|a^{2}cos^{2}x+b^{2}sin^{2}x|+c **5. log|1-e^{-x}|+c** **6. 1/elog|e^x+x^e|+c** **7. sin^{-1}x-** $\sqrt{1-x^2}$ **+c** **8. 2sinx log|secx+tanx|+c**

9. $\frac{1}{\sqrt{2}}$ **log|sec(x+** $\frac{\pi}{4}$**)+tan(x+** $\frac{\pi}{4}$**)|+c** **10.** $\frac{1}{4}$ **tan(** $\theta-\frac{\pi}{3}$**)+c** **11. x^3/3+9x+40/3log|x-3/x+3|+c** **12. –tan1/x+1/x+c**

13. e $\sqrt{x}$ **-sin e** $\sqrt{x}$ **cos e** $\sqrt{x}$ **+c** **14. 1/192[12x-3sin2x-3sin4x+sin6x+c]** **15. 2/3sin^{-1}(x$^{3/2}$/a$^{3/2}$)+c** **16.** $\frac{1}{5}$

17. -2/b^2[log|a+bcosx|+a/a+bcosx]+c **18. -2log |** $\sqrt{2}\cos x/2+\sqrt{\cos x}$ **|+e [Hint:** $\sqrt{\sec x-1}=\sqrt{1-\cos x/\cos x}=\sqrt{2}\sin x/2/\sqrt{2\cos^2 x/2-1}$ **and put cos x/2=t]** **19. 2/3(cosx/2+sinx/2)^3+c**

20. -2 $\sqrt{1-x}$ **+4/3(1-x)$^{3/2}$-2/5(1-x)$^{5/2}$+c** **21. 2[x$^{3/2}$/3-x/2+** $\sqrt{x}$ **-log(1+** $\sqrt{x}$ **)+c** **22.2[** $\sqrt{e^x-1}-\tan^{-1}\sqrt{e^x-1}$ **]+c**

23. tan x +1/3tan^{3}x+c **24. ½ tan^{2}x+log|cosx|+c** **25. log|log(secx+tanx)|+c** **26. 2-x^2/** $\sqrt{1-x^2}$ **+c**

27. - $\sqrt{a^2-x^2}/x$ **- sin^{-1}x/a+c** **28. log|1+tanx/2|+c** **29. log|(sinx+cosx) +** $\sqrt{\sin 2x}$ **|+c [Hint: Put sin x +cos x=t)**

30. sin^{-1}(sinx-cosx)+c [Hint: Put sinx-cosx=t) **31. (x+1)tan^{-1}** $\sqrt{x}-\sqrt{x}+c$ **32. ½(x^2+1)(tan^{-1}x)^2-xtan^{-1}x+1/2log(1+x^2)+c**

33. - $\sqrt{1-x}$ **sin^{-1}x^2+2** $\sqrt{1+x^2}$ **+c** **34. 2xtan^{-1}x-log(1+x^2)+c** **35. (a+x)tan^{-1}** $\sqrt{x/a}$ **-** $\sqrt{ax}$ **+c 36. x sec^{-1}** $\sqrt{x}-\sqrt{x-1}$ **+c**

37. sin2x/2log(cosx+sinx/cosx-sinx)+1/2log|cos2x|+c [Hint:d/dxlog(cosx+sinx/cosx-sinx)=2/cos2x] 38. x tanx/2+c

39. x/1+logx+c

40. $\frac{1}{2\sqrt{2}}$ **tan^{-1}(x^2-1/** $\sqrt{2}$ **x)-1/** $4\sqrt{2}$ **log|x^2-** $\sqrt{2}$ **x+1/ x^2+** $\sqrt{2}$ **x+1|+c** **41.** $1/\sqrt{2}$ **tan^{-1}(tan** θ **-cot** $\theta/\sqrt{2}$ **)+c** **42.** $\frac{1}{\sqrt{2}}$ **tan^{-1}(x^2-1/** $\sqrt{2}$ **x)+c**

43. 2log| $\sqrt{x+1}-1/\sqrt{x+1}+1$ **|+6** $\sqrt{x+1}$ **+c**

44. x/cosx(1/xsinx+cosx)+tanx+c [Hint : $\int x^2/(x\sin x+\cos x)^2 dx=\int x\cos x/(x\sin x+\cos x)^2_{II}.(x/\cos x)_I dx$ **Integrate by parts. ,** $\because$ **d/dx(x sinx+cosx)=xcosx+sinx-sinx=xcosx,** $\therefore \int x\cos x/(x\sin x+\cos x)^2 dx=(x\sin x+\cos x)^{-1}/-1=-1/x\sin x+\cos x]$

45. 3log(2sin ϕ **)+4/2-sin** ϕ **+c** **46.** $xe^{\tan^{-1}x}+c$ **47.** $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{\tan x-\cot x}{\sqrt{3}}\right)+C$

48 $\sqrt{x^2+5x+6}-\frac{1}{2}\log\left|x+\frac{5}{2}+\sqrt{x^2+5x+6}\right|+C$ **49 cos (a – b) log | sin (x + b)| - sin (a – b). x + c**

50 $\frac{1}{4}\sin^{-1}\left[\frac{4(\sin x-\cos x)}{5}\right]+c$ **51 – log |sec x|-** $\frac{1}{2}$ **log |sec 2x| +** $\frac{1}{3}$ **log |sec 3x|+ c 52** $\frac{x-a}{2}\sqrt{2ax-x^2}+\frac{a^2}{2}\sin^{-1}\frac{x-a}{a}+c$

53 $\frac{1}{6}$ **log |tan^2** θ **- tan** θ **+ 1|+** $\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{2\tan\theta-1}{\sqrt{3}}\right)-\frac{1}{3}\log|1+\tan\theta|+C$ **54** $\frac{1}{\sqrt{2}a}\tan^{-1}\left(\frac{x^2-a^2}{\sqrt{2}ax}\right)+c$ **55 tan^{-1} (cos x) + c.**

56. $2\sin^{-1}\frac{t}{k}+C=2\sin^{-1}\sqrt{\frac{x-\alpha}{\beta-\alpha}}+C$ **57.** $\frac{\tan^{11}x}{11}+\frac{\tan^9 x}{9}+C$ **58.** $\log\left|\frac{x^2+2}{\sqrt{x^2+1}}\right|+C$ **59.** $\frac{1}{\sqrt{10}}\tan^{-1}\left(\frac{\sqrt{2}\tan x}{\sqrt{5}}\right)+C$

60. $\frac{x^3}{x}\tan^{-1}x-\frac{x^2}{6}+\frac{1}{6}\log\left|1+x^2\right|+C$ **61.** $\frac{2}{3}\frac{1}{\sqrt{2}}\tan^{-1}\frac{x}{\sqrt{2}}+\frac{1}{6}\log\left|\frac{x-1}{x+1}\right|+C$ **62.** $\frac{1}{4}\log\left|x^4-9\right|+\frac{1}{12}\log\left|\frac{x^2-3}{x^2+3}\right|+C$