

Date Planned : __ / __ / __	Daily Tutorial Sheet - 3	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 1	Exact Duration : _____

31. $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$ is equal to:
- (A) $2\sqrt{\tan x} + C$ (B) $2\sqrt{\cot x} + C$ (C) $\frac{\sqrt{\tan x}}{2} + C$ (D) None of these
32. $\int 5^{5^{5^x}} \cdot 5^{5^x} \cdot 5^x dx$ is equal to:
- (A) $\frac{5^{5^x}}{(\log 5)^3} + C$ (B) $5^{5^{5^x}} (\log 5)^3 + C$ (C) $\frac{5^{5^{5^x}}}{(\log 5)^3} + C$ (D) None of these
33. The value of $\int \frac{\cos^3 x + \cos^5 x}{\sin^2 x + \sin^4 x} dx$ is:
- (A) $\sin x - 6 \tan^{-1}(\sin x) + C$ (B) $\sin x - 2(\sin x)^{-1} + C$
 (C) $\sin x - 2(\sin x)^{-1} - 6 \tan^{-1}(\sin x) + C$ (D) $\sin x - 2(\sin x)^{-1} + 5 \tan^{-1}(\sin x) + C$
34. The anti-derivative of $f(x) = e^{x/2}$ whose graph passes through the point (0, 3) is:
- (A) $3e^{x/2}$ (B) $4e^{x/2} - 1$ (C) $2e^{x/2} + 1$ (D) None of these
35. If $f(x)$ is the anti-derivative of $\tan^{-1}\sqrt{x}$ such that the curve $y = f(x)$ passes through the point (0, 2), then $f(x) =$
- (A) $x \tan^{-1}\sqrt{x} - \sqrt{x} + \tan^{-1}\sqrt{x} + 2$ (B) $x \tan^{-1}\sqrt{x} + \sqrt{x} + \tan^{-1}\sqrt{x} + 2$
 (C) $x \tan^{-1}\sqrt{x} + 2$ (D) None of these
36. The function f whose graph passes through $\left(0, \frac{7}{3}\right)$ and whose derivative is $x\sqrt{1-x^2}$ is given by:
- (A) $f(x) = \frac{1}{3} \left[(1-x^2)^{3/2} + 7 \right]$ (B) $f(x) = \frac{3}{2} \left[\sin^{-1} x + 6 \right]$
 (C) $f(x) = \frac{-1}{3} \left[(1-x^2)^{3/2} - 8 \right]$ (D) $f(x) = \frac{-2}{3} \left[(1-x^2)^{3/2} - 8 \right]$
37. If it is known that at the point $x = 1$ two anti-derivatives of $f(x) = e^x$ differ by 2, the difference of these anti-derivatives at $x = 100$ is:
- (A) e^{100} (B) 100 (C) 2 (D) None of these
38. If $\int f(x) dx = -2 \cos \sqrt{x} + C$, then $f(x) =$
- (A) $\sin \sqrt{x}$ (B) $\frac{\sin \sqrt{x}}{\sqrt{x}}$ (C) $2 \cos \sqrt{x}$ (D) None of these

39. $\int \frac{\cos 4x - 1}{\cot x - \tan x} dx$ is equal to:
 (A) $\frac{-1}{2} \cos(4x) + C$ (B) $\frac{-1}{4} \cos(4x) + C$ (C) $\frac{-1}{2} \sin(2x) + C$ (D) None of these
40. The value of $\int \frac{\sin x \cos x}{\sqrt{1 - \sin^4 x}} dx$ is equal to:
 (A) $\frac{1}{2} \sin^{-1}(\sin^2 x) + C$ (B) $-\frac{1}{2} \cos^{-1}(\sin^2 x) + C$
 (C) $\tan^{-1}(\sin^2 x) + C$ (D) $\cot^{-1}(\sin x) + C$
41. $\int \frac{dx}{\tan x + \cot x + \sec x + \operatorname{cosec} x}$ is equal to:
 (A) $\frac{1}{2}(\sin x + \cos x + x) + C$ (B) $\frac{1}{2}(\sin x - \cos x - x) + C$
 (C) $\frac{1}{2}(\cos x - x + \sin x) + C$ (D) None of these
42. Evaluate the following Integrals.
 (i) $\int \frac{x}{x^2 + x + 1} dx$ (ii) $\int (3x - 2)\sqrt{x^2 + 4x + 1} dx$ (iii) $\int (x + 1)\sqrt{x^2 + x + 1} dx$
 (iv) $\int \frac{x^2 + x + 1}{2x^2 + 4x + 1} dx$ (v) $\int \frac{dx}{4 \sin^2 + 4 \sin x \cos x + 5 \cos^2 x}$
43. Evaluate the following Integrals.
 (i) $\int \frac{dx}{4 + 5 \cos x}$ (ii) $\frac{12}{13}x - \frac{5}{13} \ln(3 \cos x + 2 \sin x) + C$ (iii) $\int \frac{2 + 3 \cos x}{\sin x + 2 \cos x + 3} dx$
 (iv) $\int \frac{dx}{(2 \sin x + 3 \cos x)^2}$ (v) $\int \frac{dx}{\cos x (\sin x + 2 \cos x)}$
44. Evaluate the following Integrals.
 (i) $\int \frac{x^2}{x^4 + 1} dx$ (ii) $\int \frac{dx}{x^4 + 1}$ (iii) $\int \sqrt{\tan x} dx$ (iv) $\int \sqrt{\cot x} dx$
 (v) $\int \frac{dx}{\sin^4 x + \cos^4 x}$
45. Evaluate the following Integrals.
 (i) $\int x \log(x + 1) dx$ (ii) $\int \frac{\log x}{x^2} dx$ (iii) $\int \frac{x}{1 + \sin x} dx$ (iv) $\int \cos(\log x) dx$
 (v) $\int \log(x + \sqrt{x^2 + a^2}) dx$ (vi) $\int \frac{\log x}{(1 + \log x)^2} dx$