



INDIAN SCHOOL AL WADI AL KABIR
Class XII, Mathematics *Worksheet- INTEGRALS*
10-09-2024

Short answer type(2 marks)

Q1.	Evaluate: $\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x} + e^{-\cos x}} dx$
Q2.	Evaluate: $\int_{-1}^1 \frac{x^3 + x + 1}{x^2 + 2 x + 1} dx$
Q3.	Evaluate: $\int_0^{\pi} \log(1 + \tan x) dx$
Q4.	Evaluate: $\int_2^9 \frac{\sqrt{x}}{\sqrt{x} + \sqrt{11-x}} dx$
Q5.	Evaluate: $\int_0^{\frac{\pi}{4}} e^x \left(\frac{2 + \sin 2x}{1 + \cos 2x} \right) dx$
Q6.	Evaluate: $\int_0^1 x e^x dx$
Q7.	Evaluate: $\int \frac{x^3 - x^2 + x - 1}{x - 1} dx$
Q8.	Evaluate: $\int \left(\frac{1}{\sin^2 x \cdot \cos^2 x} \right) dx$
Q9.	Evaluate: $\int \frac{2}{1 + \cos 2x} dx$
Q10.	Evaluate: $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$
Q11.	Evaluate: $\int \tan^{-1} \left(\sqrt{\frac{1 - \sin x}{1 + \sin x}} \right) dx$
Q12.	Evaluate: $\int \left(\frac{\sin x}{\sin(x + a)} \right) dx$
Q13.	Evaluate: $\int \frac{\sin x - x \cos x}{x(x + \sin x)} dx$

Q14.	Evaluate: $\int \left(\frac{x + \cos 6x}{3x^2 + \sin 6x} \right) dx$
Q15.	Evaluate: $\int \frac{\cos x}{(1 + \sin x)(2 + \sin x)} dx$
Q16.	Evaluate: $\int x\sqrt{x^4 - 1} dx$
Long answer type (3or 5 marks)	
Q17.	Evaluate: $\int \frac{x^2 - 3x + 1}{\sqrt{1 - x^2}} dx$
Q18.	Evaluate: $\int \frac{1}{\log x} - \frac{1}{(\log x)^2} dx$
Q19.	Evaluate $\int \frac{1}{x^3(x^5 + 1)^{\frac{3}{5}}} dx$
Q20.	Evaluate $\int \frac{\sec x}{1 + 2\sin^2 x} dx$
Q21.	Evaluate $\int \frac{1}{\sin x + \sin 2x} dx$
Q22.	Evaluate: $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx$
Q23.	Evaluate: $\int \frac{3x + 5}{x^3 - x^2 - x + 1} dx$
Q24.	Evaluate: $\int \sec^3 x dx$
Q25.	Evaluate: $\int \frac{(x - 5)e^x}{(x - 3)^3} dx$
Q26.	Evaluate $\int \frac{\sqrt{x^2 + 1}[\log(x^2 + 1) - 2\log x]}{x^4} dx$

Answers

1	$\frac{\pi}{2}$	2	$\log 4$
3	$\frac{\pi}{8} \log 2$	4	$\frac{7}{2}$
5	$e^{\frac{\pi}{4}}$	6	1
7	$\frac{x^3}{3} + x + c$	8	$\tan x - \cot x + C$
9.	$\tan x + C$	10.	$2(\sin x + x \cos a) + c$
11	$\frac{\pi}{4}x - \frac{x^2}{2} + C$	12	$x \cos a - \sin a \log \sin(x + a) + c$
13	$\log \left \frac{x}{x + \sin x} \right + c$	14	$\frac{1}{6}(3x^2 + \sin 6x) + c$
15	$\log \left \frac{1 + \sin x}{2 + \sin x} \right + c$	16	$\frac{x^2}{2} \sqrt{x^4 - 1} + \frac{1}{2} \log x^4 + \sqrt{x^4 - 1} + C$
17	$-\frac{x}{2} \sqrt{1 - x^2} + \frac{3}{2} \sin^{-1} x + 3\sqrt{1 - x^2} + c$	18	$\frac{x}{\log x} + c$
19	$-\frac{1}{2} \left(1 + \frac{1}{x^5} \right)^{\frac{2}{5}} + c$	20	$\frac{1}{6} \log \left \frac{1 + \sin x}{1 - \sin x} \right + \frac{\sqrt{2}}{3} \tan^{-1}(\sqrt{2} \sin x) + c$
21	$\frac{1}{2} \log 1 + \cos x + \frac{1}{6} \log 1 - \cos x $ $-\frac{2}{3} \log 1 + 2 \cos x + c$	22	$\sqrt{2} \sin^{-1}(\sin x - \cos x) + c$
23	$-\frac{1}{2} \log x - 1 - \frac{4}{x - 1} + \frac{1}{2} \log x + 1 + c$	24	$\frac{1}{2} (\sec x \tan x + \log \sec x + \tan x + c$
25	$\frac{e^x}{(x - 3)^2} + c$	26	$-\frac{1}{3} \left(1 + \frac{1}{x^2} \right)^{\frac{3}{2}} \left[\log \left(1 + \frac{1}{x^2} \right) - \frac{2}{3} \right] + c$

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