Class XII Mathematics   Definite Integrals – Board Questions

Evaluate the following:

1. $\displaystyle\int_0^{\sqrt{3}} \frac{dx}{1+x^2}$	**2.** $\displaystyle\int_2^3 \frac{xdx}{1+x^2}$	**3.** $\displaystyle\int_0^1 \log\!\left(\frac{1-x}{x}\right)dx$	**4.** $\displaystyle\int_0^1 \frac{\tan^{-1}x}{1+x^2}\,dx$
5. $\displaystyle\int_{-\pi/2}^{\pi/2} \sin^5 x\,dx$	**6.** $\displaystyle\int_{-5}^{5} |\,x+2\,|\,dx$	**7.** $\displaystyle\int_0^2 |\,x^2+2x-3\,|\,dx$	**8.** $\displaystyle\int_1^2 \frac{xdx}{(1+x)(2+x)}$
9. $\displaystyle\int_1^4 (|x-1|+|x-2|+|x-4|)dx$	**10.** $\displaystyle\int_{-1}^{3/2} |x\cos\pi x|dx$	**11.** $\displaystyle\int_{-1}^{3/2} |x\sin\pi x|dx$	**12.** $\displaystyle\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}}\,dx$
13. $\displaystyle\int_0^{\frac{\pi}{2}} \frac{\sin x-\cos x}{1+\sin x\cos x}dx$	**14.** $\displaystyle\int_0^{\frac{\pi}{2}} \frac{\sin^5 x}{\sin^5 x+\cos^5 x}dx$	**15.** $\displaystyle\int_0^{\pi} \frac{e^{\cos x}}{e^{\cos x}+e^{-\cos x}}\,dx$	**16.** $\displaystyle\int_1^2 \frac{\sqrt{x}}{\sqrt{3-x}+\sqrt{x}}\,dx$
17. $\displaystyle\int_0^{\frac{\pi}{2}} \frac{\sqrt{\tan x}}{1+\sqrt{\tan x}}\,dx$	**18.** $\displaystyle\int_{\pi/6}^{\pi/3} \frac{dx}{1+\sqrt{\tan x}}$	**19.** $\displaystyle\int_0^{\pi} \frac{x\sin x}{1+\cos^2 x}dx$	**20.** $\displaystyle\int_0^{\pi} \frac{x\tan x}{\sec x+\tan x}dx$
21. $\displaystyle\int_0^{\frac{\pi}{4}} \log(1+\tan x)\,dx$	**22.** $\displaystyle\int_0^{\frac{\pi}{2}} (2\log\sin x-\log\sin 2x)dx$	**23.** $\displaystyle\int_0^{\frac{\pi}{2}} \log\sin x\,dx$	**24.** $\displaystyle\int_0^{\pi} \log(1+\cos x)\,dx$
$\displaystyle\int_0^{\pi} \frac{1}{a^2\cos^2 x+b^2\sin^2 x}dx$	$\displaystyle\int_0^{\pi} \frac{x}{a^2\cos^2 x+b^2\sin^2 x}dx$	**27.** $\displaystyle\int_0^{\frac{\pi}{4}} \frac{\sin x\cos x}{\cos^4 x+\sin^4 x}dx$	**28.** $\displaystyle\int_0^{\pi/4} \frac{(\sin x+\cos x)dx}{(9+16\sin 2x)}$
29. $\displaystyle\int_0^{\frac{\pi}{2}} \frac{x\sin x\cos x}{\cos^4 x+\sin^4 x}dx=\frac{\pi^2}{16}$	**30.** $\displaystyle\int_0^{\frac{\pi}{2}} \frac{\sin^2 x}{\sin x+\cos x}dx$	**31.** $\displaystyle\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x+\cos x}{\sqrt{\sin 2x}}\,dx$	**32.** $\displaystyle\int_0^{\frac{\pi}{2}} (\sqrt{\tan x}+\sqrt{\cot x})dx$
33. $\displaystyle\int_{\pi/2}^{\pi} e^x\!\left(\frac{1-\sin x}{1-\cos x}\right)dx$	**34.** $\displaystyle\int_0^{\pi} \frac{x}{1+\sin x}dx$	**35.** $\displaystyle\int_1^3 (2x^2+5x)dx.$ as limit of sum	**36.** $\displaystyle\int_0^{\pi} \frac{x\tan x}{\sec x\tan x}dx$
37. $\displaystyle\int_0^1 x^2(1-x)^n\,dx$	**38.** $\displaystyle\int_0^1 \cot^{-1}(1-x+x^2)dx$	**39.** $\displaystyle\int_1^2 \frac{5x^2}{x^2+4x+3}\,dx$	**40.** $\displaystyle\int_0^1 \frac{\log(1+x)}{1+x^2}dx$
41. $\displaystyle\int_{-a}^{a} \sqrt{\frac{a-x}{a+x}}\,dx$	**42.** $\displaystyle\int_0^{\pi} \frac{x\tan x}{\sec x+\cos x}dx$	**43.** $\displaystyle\int_0^{\pi} \frac{x\tan x}{\sec x\cos ecx}dx$	**44.** $\displaystyle\int_0^a \sin^{-1}\sqrt{\frac{x}{a+x}}dx$
45. $\displaystyle\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} e^x(\log\sin x+\cot x)\,dx$	**46.** $\displaystyle\int_{\frac{\pi}{2}}^{\pi} \frac{1-\sin x}{1-\cos x}dx$	**47.** $\displaystyle\int_0^{\frac{\pi}{2}} \frac{dx}{5+4\sin x}$	**48.** $\displaystyle\int_0^{3/2} |x\cos\pi x|dx$