INDIAN SCHOOL AL WADI AL KABIR

Class XII, Mathematics ***Worksheet- INTEGRALS***

06-09-2026

MCQ

Q1. $\int \frac{cos2x}{cos^2 x sin^2 x} dx$

(A) $\cot x + \tan x + C$ (B) $-\cot x + \sec x + C$

(C) $-\cot x + \tan x + C$ (D) $-(\tan x + \cot x) + C$

Q2. $\int \frac{dx}{x^2 + 6x + 10}$

(A) $x \tan^{-1}(x + 3) + C$ (B) $\tan^{-1}(x + 3) + C$

(C) $\frac{1}{3} \tan^{-1}(x + 3) + C$ (D) $\tan^{-1} x + C$

Q3. $\int \frac{dx}{\sec x + \tan x}$ is equal to

(A) $\log | \sec x + \tan x | + C$ (B) $\log | \sec x - \tan x | + C$

(C) $\log | 1 + \cos x | + C$ (D) $\log | 1 + \sin x | + C$

Q4. $\int \frac{dx}{2^x + 2^{-x}}$ is equal to :

(A) $\tan^{-1}(2^x) + C$ (B) $\tan^{-1}(2^{-x}) + C$

(C) $\frac{\tan^{-1}(2^x)}{\log 2} + C$ (D) $(\log 2) \tan^{-1}(2^x) + C$

Q5 $\int \sqrt{\frac{1 - \cos 2x}{1 + \cos 2x}} dx$ is equal to :

(A) $\log |\sec^2 x| + C$ (B) $\log |\cos x| + C$

(C) $\log |1 + \cos 2x| + C$ (D) $\log |\sec x| + C$

Q6. $\int \frac{dx}{\sqrt{25 - 16x^2}}$ is equal to :

(A) $\frac{1}{5} \sin^{-1} 4x + C$ (B) $\frac{1}{25} \sin^{-1} 16x + C$

(C) $\frac{1}{4} \sin^{-1} \frac{4x}{5} + C$ (D) $\frac{1}{16} \sin^{-1} \frac{4x}{5} + C$

Q7. If $\int_0^1 \frac{dx}{e^x + e^{-x}} = \tan^{-1} e + k$, then the value of k is :

(A) e (B) $\frac{\pi}{4}$

(C) 0 (D) $-\frac{\pi}{4}$

Q8. $\int_0^1 xe^x dx$

(A) 1 (B) 0 (C) 2 (D) -1

Q9. The value of $\int_0^1 \frac{1}{3x - 4} dx$ is :

(A) $\frac{1}{3} \log 4$ (B) $-\frac{1}{3} \log 4$

(C) $\log (-4)$ (D) $\log 4$

Q10. If $\int_0^{2a} \frac{1}{1 + 4x^2} dx = \frac{\pi}{6}$, then the value of a is

(A) $\frac{\sqrt{3}}{4}$ (B) $\frac{\sqrt{3}}{2}$

(C) $\sqrt{3}$ (D) $2\sqrt{3}$

Short Answer type(2marks)

Q.11. $Evaluate: \int \frac{x^3-x^2+x-1}{x-1} dx$ Ans: $\frac{x^3}{3} + x + c$

Q.12. $Evaluate: \int \left(\frac{1}{sin^2x.cos^2x}\right) dx$ Ans: $tanx - cotx + C$

Q.13. $Evaluate: \int \frac{2}{1+cos2x} dx$ Ans: tanx + C

Q.14 $Evaluate: \int \frac{cos2x-cos2\alpha}{cosx-cos\alpha} dx$ Ans: $2(sinx + xcos\alpha) + c$

Q.15 $Evaluate: \int \frac{sinx-xcosx}{x(x+sinx)} dx$ $Ans: log\left|\frac{x}{x+sinx}\right| + c$

Long answer type (3 or 5 marks)

Q.16 $Evaluate: \int \frac{x^2-3x+1}{\sqrt{1-x^2}} dx$ Ans: $-\frac{x}{2}\sqrt{1-x^2} + \frac{3}{2}sin^{-1}x + 3\sqrt{1-x^2} + c$

Q.17

$Evaluate: \int \frac{1}{logx} - \frac{1}{(logx)^2}\ dx$ Ans: $\frac{x}{logx} + c$

Q.18

$Evaluate \int \frac{1}{x^3(x^5+1)^{\frac{3}{5}}} dx$ Ans: $-\frac{1}{2}\left(1 + \frac{1}{x^5}\right)^{\frac{2}{5}} + c$

Q.19

Evaluate : $\int_{\frac{\pi}{12}}^{\frac{5\pi}{12}} \frac{dx}{1+\sqrt{\cot x}}$

Ans: $\frac{\pi}{6}$ $(Use\ properties\ of\ integrals)$

Q.20

Evaluate :

$$\int_0^{\pi} \frac{x\,dx}{1+\sin x}$$

Ans: π $(Use\ properties\ of\ integrals)$

Q21.

Evaluate :

$$\int_0^2 \frac{1}{\sqrt{x^2+2x+3}}\,dx$$

Ans: $\log\left(\frac{3+\sqrt{11}}{1+\sqrt{3}}\right)$

Q.22 $\text{Find}: \int \frac{3x-1}{\sqrt{x^2-4x}}\,dx$

Ans:

$$3\sqrt{x^2-4x} + 5\log\left|(x-2)+\sqrt{x^2-4x}\right|+C$$

Q23. $\text{Evaluate}: \int_0^1 x\sin^{-1}x\,dx$

Ans: $\frac{\pi}{8}$ (Use uv rule)

Q.24 $\text{Find}: \int \frac{x}{(x-1)(x^2+4)}dx$

Ans: (Partial Fraction Method)

$$\frac{1}{5}\log|x-1|-\frac{1}{10}\log(x^2+4)+\frac{2}{5}\tan^{-1}\left(\frac{x}{2}\right)+c$$

Q.25 $\text{Evaluate}: \int_0^1 \frac{x\tan^{-1}x}{(1+x^2)^{\frac{3}{2}}}dx.$

Ans: (substitute x= tant) $\frac{4-\pi}{4\sqrt{2}}$

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MCQ ANSWERS

Q1	**D**	**Q2**	**B**	**Q3**	**C**	**Q4**	**C**	**Q5**	**D**
Q6	**C**	**Q7**	**D**	**Q8**	**A**	**Q9**	**B**	**Q10**	**A**

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