



# MATHS

## BOOKS - MAHAVEER PUBLICATION

### INTEGRATION

#### Question Bank

1. Write an antiderivative for each of functions using the method of inspection :  $\sin 2x$



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2. Write an antiderivative for each of functions using the method of inspection :  $e^{2x}$



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3. Write an antiderivative for each of functions using the method of inspection :  $\cos 3x - e^2 x$



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4. Find the integral of function  $\int \tan^2 x dx$



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5. Find the integrals of functions

$$\int \left( \frac{2x^2 + 3}{x} \right)^3 dx$$



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6. Find the integrals of functions

$$\int \left( \frac{x^3 + 1}{x + 1} \right) dx$$



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7. Find the integrals of functions

$$\int (3x^2 + e^{2x} + \sin 2x) dx$$



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8. Find the integrals of functions

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



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9.  $\int \frac{2 - 3 \sin x}{\cos^2 x} dx$



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10.  $\int \frac{1 - \sin x}{\cos^2 x} dx$



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11. Find the integrals functions

$$\int \frac{\cos 2x}{\sqrt{1 + \sin 2x}} dx$$



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12. Evaluate

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



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13. Evaluate:  $\int \frac{\sin x}{\sin x - \cos x} dx$



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14. Evaluate:  $\int \cos^3 3x dx$



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15. Evaluate:  $\int \frac{dx}{1 - \cos x}$



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16.  $\int \frac{1 + \cos 2x}{1 - \cos 2x} dx$

A.  $\tan x - x - c$

B.  $\tan x + x + c$

C.  $\tan x + c$

$$D. \cot x + c$$

**Answer: A**



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$$17. \int \frac{1}{1 - \sin x} \cdot dx$$

A.  $\tan x - \sec x + c$

B.  $\sin x + c$

C.  $\tan x + \sec x + c$

D.  $\tan x + c$



**Answer: C**



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18.  $\int \frac{1}{1 - \cos 2x} dx$

A.  $\frac{1}{2} \cot x$

B.  $-\frac{1}{2} \tan x + c$

C.  $2 \tan x$

D.  $-\frac{1}{2} \cot x$

**Answer: A**



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$$19. \int \frac{\cos x}{1 + \cos x} dx =$$

A.  $\sec x + c$

B.  $\cot x + c$

C.  $-\cos ecx + c$

D.  $-\cos ecx + \cot x + x + c$

**Answer: D**



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20.  $\int \tan^2 x \, dx$

A.  $\tan x = c$

B.  $\tan x - x + c$

C.  $\cot x - x + c$

D.  $\sec x + c$

**Answer: B**



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21.  $\int(3x\sqrt{x} + 4\sqrt{x} + 5)dx =$

A.  $\frac{6}{5}x^{\frac{5}{2}} - \frac{8}{3}x^{\frac{3}{2}} + 5x + c$

B.  $\frac{6}{5}x^{\frac{5}{2}} + \frac{8}{3}x^{\frac{3}{2}} + 5x + c$

C.  $\frac{6}{5}x^{\frac{5}{2}} + \frac{4}{3}x^{\frac{3}{2}} + 5x + c$

D.  $\frac{4}{5}x^{\frac{5}{2}} + \frac{8}{3}\frac{x^3}{2} + 5x + c$

**Answer: B**



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$$22. \int \left( \sqrt{x} + \frac{1}{\sqrt{x}} \right)^2 dx =$$

A.  $\frac{x^2}{2} \log x - 2x + c$

B.  $\frac{x^2}{2} + \log x + 2x + c$

C.  $\frac{x^2}{2} - \log x + 2x + c$

D.  $\frac{x^2}{2} + \log x + 4x + c$

**Answer: B**



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23.  $\int \left( 3x + \frac{1}{x} + 4 \right) dx =$

A.  $\frac{3}{2}x^2 + \log x + 4x + c$

B.  $\frac{3}{2}x^3 + 2\log x + 4x + c$

C.  $\frac{3}{2}x^3 + \log x - 4x + c$

D.  $\frac{3}{2}x^2 - \log x + 4x + c$

**Answer: A**



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24.  $\int \frac{x^6 + 1}{x^2 + 1} dx$

A.  $\left( \frac{x^5}{5} - \frac{x^2}{2} + x + c \right)$

B.  $\frac{x^5}{5} - \frac{x^3}{3} + x + c$

C.  $\frac{x^5}{5} - \frac{x^3}{3} + x + c$

D.  $\frac{x^5}{5} + \frac{x^3}{3} + x + c$

**Answer: C**



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25.  $\int \frac{\sin^3 x - \cos^3 x}{\sin^2 x \cos^2 x} dx$

A.  $\sec x - \operatorname{cosec} x + c$

B.  $\sec x + \operatorname{cosec} x + c$

C.  $\sec x + \operatorname{cosec} x + c$

D.  $\sec x + \operatorname{cosec} x + c$

**Answer: D**



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26.  $\int \frac{\sin^2 x}{1 + \cos x} dx =$

A.  $2(\csc x - \cot x) - x + c$

B.  $2(\csc x + \cot x) - x + c$

C.  $2(\sec x - \tan x) - x + c$

D.  $2(\sec x + \tan x) - x + c$

**Answer: A**



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$$27. \int \frac{(1 + \sqrt{x})^2}{\sqrt{x}} dx =$$

$$A. 2\sqrt{x} + 4x + \frac{2}{3} \frac{x^5}{2} + c$$

$$B. \sqrt{x} + 2x + \frac{2}{3} \frac{x^3}{2} + c$$

$$C. 2\sqrt{x} + 2x + \frac{2}{3} x^{3/2} + c$$

$$D. 3\sqrt{x} + 2x + \frac{2}{3} x^{3/2} + c$$

**Answer: C**



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28.  $\int e^x \sin(e^x) dx =$

A.  $\cos(e^x) + c$

B.  $\cos(e^x) + c$

C.  $\sin(e^x) + c$

D.  $-\sin(e^x) + c$

**Answer: A**



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29.  $\int (x^a + e^{ax} + e^a) dx =$

A.  $\frac{x^a}{a} + \frac{e^{ax}}{a} + e^a x + c$

B.  $\frac{x^a}{a+1} + \frac{e^{ax}}{a} + e^a x + c$

C.  $\frac{x^{a+1}}{a+1} + \frac{e^{ax}}{a} + e^a x + c$

D.  $\frac{x^a}{a-1} + \frac{e^{ax}}{a} + e^a x + c$

**Answer: C**



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30.  $\int k f(x) dx =$

A.  $k \int f(x) dx$

B.  $k + \int f(x) dx$

C.  $\frac{1}{k} \int f(x) dx$

D.  $\int f(x) dx$

**Answer: A**



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**31.** Find the antiderivative of functions by the method of inspection:  $\sin 2x$



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**32.** Find the antiderivative of functions by the method of inspection:  $(ax + b)^3$



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**33.** Find the antiderivative of functions by the method of inspection:  $\cos 3x - e^{2x}$



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**34.** Find the antiderivative of functions by the method of inspection:  $\sin 2x - 4e^{3x}$



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**35.** Find the antiderivative of functions by the method of inspection:  $e^{mx}$



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**36.** Find the antiderivative of functions by the method of inspection:  $3x^2 - e^x$



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**37.** Evaluate:  $\int (x^3 + 3\sqrt{x} - 7) dx$





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38. Evaluate:  $\int \frac{x^3 + 3x + 5}{x + 2} dx$



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39.  $\int (ax^3 + bx^2 + cx + d) dx$



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40. Evaluate:  $\int \left( ax^{\frac{3}{2}} + be^x - \frac{1}{x} \right) dx$



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$$41. \int \frac{\sqrt{1 + \cos x}}{1 - \cos x} dx =$$



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$$42. \int \sqrt{1 + \cos x} dx$$



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43.  $\int \left( \sqrt{x} - \frac{1}{\sqrt{x}} \right)^2 dx$



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44. Evaluate  $\int \frac{1}{1 + \sin x} dx$ .



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45.  $\int \frac{\tan x}{\sec x + \tan x} dx =$



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46. Evaluate:  $\int(2x^2 - 3 \sin x + 5\sqrt{x}) dx$



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47.  $\int \operatorname{cosec} x (\operatorname{cosec} x + \cot x) dx = ?$



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48.  $\int \frac{\sec^2 x}{\operatorname{cosec}^2 x} dx$



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