



MATHS

BOOKS - CHHAYA PUBLICATION MATHS (BENGALI ENGLISH)

IDENFINITE INTEGRAL

Example

1. Integrate each of the following functions :

$$\frac{(x - 2)^3}{x^2}$$



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2. Integrate each of the following functions :

$$\frac{px^2 + qx + r}{x\sqrt{x}}$$

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3. Integrate each of the following functions :

$$\frac{x^3 + 4x^2 + x - 6}{x^2 + 2x}$$

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4. Evaluate :

$$\int \frac{2e^{4x} - 3e^{2x} + 4}{e^{3x}} dx$$

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5. Evaluate :

$$\int \frac{e^{6x} + e^{4x}}{e^x + e^{-x}} dx$$



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6. Evaluate :

$$\int \frac{e^{2 \log x} - e^{-\log x}}{e^{2 \log x} - e^{\log x}} dx$$



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7. Find the integrals of

$$\frac{3^{2x} - 2 \cdot 3^x + 6}{3^x}$$



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8. Find the integrals of

$$\frac{8^{2+x} - 4^{2-x}}{2^{x+3}}$$



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9. Evaluate :

$$\int \cos^2 2x dx$$



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10. Evaluate :

$$\int \sin^3 x dx$$



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11. Evaluate :

$$\int \sin 3x \sin 4x dx$$



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12. Evaluate :

$$\int \sin^2 3x \cos 3x dx$$



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13. Evaluate :

$$\int \sin x \cos 3x \sin 5x dx$$



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14. Evaluate ,

$$\int \frac{\tan \theta}{\cos \theta} d\theta$$



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15. Evaluate ,

$$\int \sec^2 \theta \operatorname{cosec}^2 \theta d\theta$$



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16. Evaluate

$$\int \frac{dx}{1 + \cos x}$$



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

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18. Evaluate

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

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19. Evaluate

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

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20. Evaluate

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



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21. Evaluate

$$\int \frac{\cos 2\theta - \cos 2\alpha}{\sin \alpha - \sin \theta} d\theta$$



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22. Evaluate ,

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



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23. Evaluate ,

$$\int \frac{\cos x}{\sin^2 x} (1 - 3 \cos^3 x) dx$$



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24. Evaluate :

$$\int \tan^{-1} \left(\frac{1 + \cos x}{\sin x} \right) dx$$



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25. Evaluate: $\int \tan^{-1}(\sec x + \tan x) dx$, $\sqrt{-\pi}/2$



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26. Evaluate

$$\int \tan^{-1} \left\{ \sqrt{\frac{1 - \sin x}{1 + \sin x}} \right\} dx, \quad -\frac{\pi}{2} < x < \frac{\pi}{2}$$



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27. Find the function whose derivative is $3 \sin x \cos^2 x - \sin^3 x$



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28. If $\frac{dy}{dx} = \frac{1}{x}$ at any point (x,y) on a curve , find the equation of the family of curves



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29. The slope of a curve at (x,y) is $(x^2 - 2)$ and it passes through the point $(3,8)$. Find the equation of the curve



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Exercise Multiple Choice Questions

1. $\int x^n dx$ is equal to -

A. nx^{n-1}

B. $\frac{x^{n+1}}{n+1} + c$

C. $\frac{x^{n+1}}{n+1} + c$ when $n \neq -1$

D. none of these

Answer: C



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2. If k is a constant , then the integral of k w.r.t x is-

A. $\frac{k}{x} + c$

B. kx

C. $kx + c$

D. $kx^2 + c$

Answer: C



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3. If $\frac{dy}{dx} = 6x$, then $y =$

A. 6

B. $3x^2$

C. $2x^2$

D. $6x^2$

Answer: B



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4. $\int \sec^2 x \csc^2 x dx$ is a function of -

A. $\tan x$

B. $\sin x$

C. $\cos x$

D. none of these

Answer: A



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5. The $\frac{dy}{dx} = 6x$ then $y =$

A. $\cot \theta - \theta$

B. $-\cot \theta + \theta + c$

C. $\cot \theta + \theta + c$

D. $-\cot \theta - \theta + c$

Answer: D



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6. To evaluate $\int \sin^2 x dx$ we are to use the formula of -

A. $\sin 2x$

B. $\cos 2x$

C. $\tan 2x$

D. none of these

Answer: B



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7. The value of $\int \sin x^\circ dx$ is

A. $\frac{\pi}{180} \cos x^\circ + c$

B. $\frac{180}{\pi} \cos x^\circ + c$

C. $-\frac{180}{\pi} \cos x^\circ + c$

D. $-\frac{180}{\pi} \cos x^\circ + c$

Answer: C



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8. The value of $\int 2^{3x} dx$ is -

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

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

C. $\frac{3 \times 2^{3x}}{\log 2}$

D. $3 \log 2 \times 2^{3x} + c$

Answer: B



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9. The value of $\int e^{5 \log x} dx$ is -

A. $\frac{e^{5 \log x}}{5}$

B. $\frac{e^{5 \log x}}{5 \log x} + c$

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

D. $\frac{x^6}{6} + c$

Answer: D



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10. $\int \frac{x^2 + 1}{x} dx$ is equal to -

A. $\frac{1}{2}x^2 = \log|x| + c$

B. $\log x + \frac{1}{2}x^2 + c$

C. $x + \log|x| + c$

D. $x^2 + \log|x| + c$

Answer: A



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11. If the derivative of a function is \sqrt{x} , then the function is -

A. $\frac{1}{2\sqrt{3}} + c$

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

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

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

Answer: B



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12. If $\frac{dy}{dx} = 3x^2 - 2$, then the value of y is -

A. $x^3 - 2x + c$

B. $x^3 - 2c$

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

D. $x^3 - 2x^2 + c$

Answer: A



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13. The value of $\int(\operatorname{cosec}2x \cot 2x) dx$ is -

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

B. $2 \cot 2x + c$

C. $-2 \operatorname{cosec} 2x + c$

D. $-\frac{\operatorname{cosec} 2x}{2} + c$

Answer: D



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14. If $m \neq 0$, then the value of $\int \sec mx \tan mx dx$ is -

A. $m \sec mx + c$

B. $m \tan mx + c$

C. $\frac{\sec mx}{m} + c$

D. $\frac{\tan mx}{m} + c$

Answer: C



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Very Short Answer Type Questions

1. Prove that , $\int a^x dx = \frac{a^x}{\log_e a} + c$, where $a > 0$. Does the formula hold for $a = 1$?

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2. Prove by using definition of indefinite integral :

$$\int \sin mx dx = - \frac{\cos mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .

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3. Prove by using definition of indefinite integral :

$$\int \cos mx dx = \frac{\sin mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .



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4. Prove by using definition of indefinite integral :

$$\int \sec^2 mx dx = \frac{\tan mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .



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5. Prove by using definition of indefinite integral :

$$\int \operatorname{cosec}^2 mx dx = - \frac{\cot mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .





6. Prove by using definition of indefinite integral :

$$\int \sec mx \tan mx dx = \frac{\sec mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .



7. Prove by using definition of indefinite integral :

$$\int \operatorname{cosec} mx \cot mx dx = - \frac{\operatorname{cosec} mx}{m} + c$$

where $m \neq 0$ is a constant independent of x and c is an arbitrary constant .



8. Using the definition of integration find y in terms of x :

$$\frac{dy}{dx} = 3x^2 + 2$$

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9. Using the definition of integration find y in terms of x :

$$dy = (ax + b)dx$$

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10. Using the definition of integration find y in terms of x :

$$\frac{dy}{dx} = 2 \sin 2x$$

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11. Using the definition of integration find y in terms of x :

$$\frac{dy}{dx} = \sqrt{x} : \text{ given } y = 3, \text{ when } x = 4$$

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12. Integrate each of the following functions w.r.t . X :

$$x^{\frac{2}{3}}$$

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13. Integrate each of the following functions w.r.t . X :

$$\frac{2}{\sqrt[4]{x^3}}$$

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14. Integrate each of the following functions w.r.t . X :

$$x^4 - 2x^2 + 5$$



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15. Integrate each of the following functions w.r.t . X :

$$\left(x - \frac{2}{x} \right)^3$$



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16. Integrate each of the following functions w.r.t . X :

$$(x + 3)(x^2 - 5)$$



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17. Integrate each of the following functions w.r.t . X :

$$\frac{1}{\sqrt{x}} \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right)^2$$



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18. Evaluate :

$$\int e^{3 \log x} dx$$



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19. Evaluate :

$$\int \frac{(e^{5x} - 2e^{3x} + 3)}{e^x} dx$$



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20. Evaluate :

$$\int \frac{e^{5x} + e^{3x}}{e^x + e^{-x}} dx$$



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21. Evaluate :

$$\int (e^{2 \log x} - 2e^{-3 \log x}) dx$$



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22. Evaluate :

$$\int e^{-4x} dx$$



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23. Integrate :

$$\int 5^{2x} dx$$



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24. Integrate :

$$\int (x^4 + 4^x) dx$$



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25. Integrate :

$$\int (e^{x \log a} + e^{a \log x}) dx$$



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26. Evaluate the following integrals :

$$\int \sin^2 2x dx$$



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27. Evaluate the following integrals :

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



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28. Evaluate the following integrals :

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



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29. Evaluate the following integrals :

$$\int \sec x (\sec x + \tan x) dx$$



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30. Evaluate the following integrals :

$$\int \operatorname{cosec} x (\operatorname{cosec} x - \cot x) dx$$



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31. Evaluate the following integrals :

$$\int \cot^2 \theta d\theta$$



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32. Evaluate the following integrals :

$$\int \cos^2 \theta d\theta$$

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33. Evaluate the following integrals :

$$\int \frac{1 + \tan^2 x}{1 + \cot^2 x} dx$$

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34. Evaluate the following integrals :

$$\int \frac{\sec x + 2 \cot^2 x + \cos^2 x}{\cos x} dx$$

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35. Evaluate the following integrals :

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

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36. If $\frac{dy}{dx} = 2x^2 - 3$ at any point (x,y) on a curve , find the equation of the family of curves .

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Short Answer Type Questions

1. Integrate each of the following functions w.r.t . X:

$$\frac{3x^2 - 4x + 5}{\sqrt{5}}$$

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2. Integrate each of the following functions w.r.t . X:

$$\frac{(x^2 + 1)^2}{x^3}$$

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3. Integrate each of the following functions w.r.t . X:

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

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4. Integrate each of the following functions w.r.t . X:

$$\frac{12x^2 - 7x - 10}{3x + 2}$$

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5. Integrate each of the following functions w.r.t . X:

$$\frac{x^2 - 6x + 9}{x - 3}$$



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6. Integrate each of the following functions w.r.t . X:

$$\frac{x^6 - 1}{x - 1}$$



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7. Integrate each of the following functions w.r.t . X:

$$\frac{x^3 - 4x^2 + 5x - 1}{(x - 1)^2}$$



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8. Integrate each of the following functions w.r.t . X:

$$\frac{x^4 + x^2 + 1}{x^2 - x + 1}$$

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9. Integrate each of the following functions w.r.t . X:

$$\frac{2x^2 - 4x + 1}{x^2}$$

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10. Evaluate :

$$\int \frac{e^{6 \log x} - e^{4 \log x}}{e^{3 \log x} - e^{\log x}} dx$$

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11. Evaluate :

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



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12. Integrate :

$$\int \frac{8^{2+x} + 2}{2^{x+3}} dx$$



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13. Integrate :

$$\int \frac{(27)^{1+x} + 9^{1-x}}{3^x} dx$$



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14. Integrate :

$$\int \frac{2^{6x} - 1}{2^{2x} - 1} dx$$



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15. Evaluate the following integrals :

$$\int \cos^3 x dx$$



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16. Evaluate the following integrals :

$$\int \sin^4 x dx$$



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17. Evaluate the following integrals :

$$\int \cos^4 x dx$$

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18. Evaluate the following integrals :

$$\int \frac{\cos x + \sin x}{\cos x - \sin x} (1 - \sin 2x) dx$$

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19. Evaluate the following integrals :

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

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20. Evaluate the following integrals :

$$\int \frac{\sin^3 x + \cos^3 x}{\sin x + \cos x} dx$$

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21. Evaluate the following integrals :

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

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22. Evaluate the following integrals :

$$\int \frac{\sin \theta + \cos \theta}{\sqrt{1 + \sin 2\theta}} d\theta$$

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23. Evaluate the following integrals :

$$\int (\cos^3 \theta - 3 \cos \theta \sin^2 \theta) d\theta$$

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24. Evaluate the following integrals :

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

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25. Evaluate the following integrals :

$$\int \frac{a \sin^3 x + b \cos^3 x}{\sin^2 x \cos^2 x} dx$$

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26. Evaluate the following integrals :

$$\int \frac{\cos^2 x - \sin^2 x}{\sqrt{1 + \cos 4x}} dx$$

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27. Evaluate the following integrals :

$$\int \tan^{-1} \left(\frac{\sin x}{1 - \cos x} \right) dx$$

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28. Show that :

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

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29. Show that :

$$\int \sqrt{1 - \cos 2x} dx = -\sqrt{2} \cos x + c$$

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30. Show that :

$$\int \sqrt{1 + \sin 2x} dx = -\sin x - \cos x + c$$

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31. Show that :

$$\int \sqrt{1 + \sin x} dx = 2 \left(\sin. \frac{x}{2} - \cos. \frac{x}{2} \right) + c = 2\sqrt{1 - \sin x} + c$$

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32. Show that :

$$\int \frac{dx}{1 + \sin x} = \tan x - \sec x + c$$



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33. Show that :

$$\int \frac{dx}{1 - \cos x} = -(\operatorname{cosec} x + \cot x) + c$$



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34. Show that :

$$\int \frac{\cos x dx}{\sqrt{1 + \sin x}} = 2 \left(\sin. \frac{x}{2} + \cos. \frac{x}{2} \right) + c$$



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35. Show that :

$$\int \sin 7x \cos 3x dx = - \left[\frac{1}{20} \cos 10x + \frac{1}{8} \cos 4x \right] + c$$

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36. Show that :

$$\int \cos 2x \cos 4x dx = \frac{\sin 6x}{12} + \frac{\sin 2x}{4} + c$$

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37. Show that :

$$\int \cos 7x \sin 4x dx = \frac{1}{6} \cos 3x - \frac{1}{22} \cos 11x + c$$

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38. Show that :

$$\int \sin 7x \sin 3x dx = \frac{1}{8} \sin 4x - \frac{1}{20} \sin 10x + c$$



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39. The slope of a curve at (x,y) is $2x + 1$. If the curve passes through the point ($-4, 2$) , find the equation of the curve .



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40. Find the equation of the curve whose slope at any point (x,y) is $(- y)$ and which through the point $(2,1)$



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41. Find a function whose differential is $\sin^2 x \cos^2 x dx$



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42. If $\frac{dy}{dx} = 3\sqrt{x} - \frac{1}{\sqrt{x}}$, find y as a formula of x , given y = 12

when x = 4



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Long Answer Type Questions

1. Prove :

$$\int \sin x \sin 2x \cos 3x dx = \frac{1}{4} \left(\frac{\sin 2x}{2} + \frac{\sin 4x}{4} - \frac{\sin 6x}{6} - x \right) + c$$



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2. Prove :

$$\int \cos x \cos 2x \cos 3x dx = \frac{1}{4} \left(x + \frac{\sin 2x}{2} + \frac{\sin 4x}{4} + \frac{\sin 6x}{6} \right) + c$$



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3. Prove :

$$\int \sin x \cos 2x \cos 3x dx = -\frac{1}{4} \left(\frac{\cos 2x}{2} - \frac{\cos 4x}{4} + \frac{\cos 6x}{6} \right) + c$$



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4. Prove :

$$\begin{aligned} & \int \sin x \sin 2x \sin 3x dx \\ &= -\frac{1}{48} (6 \cos 2x + 3 \cos 4x - 2 \cos 6x) + c \end{aligned}$$



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5. Prove :

$$\int \sin^2 x \cos 2x dx = \frac{1}{4} \left(\sin 2x - \frac{\sin 4x}{4} - x \right) + c$$



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6. Prove :

$$\int 2 \cos^2 2x \sin 4x dx = -\frac{1}{16} (4 \cos 4x + \cos 8x) + c$$



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7. Prove :

$$\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx = 2(x \cos \alpha + \sin x) + c$$



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8. Prove :

$$\int \frac{\sin x - \cos 2x}{1 + \sin x} dx = -(x + 2 \cos x) + c$$



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9. Prove :

$$\int \frac{\cos x - \cos 2x}{1 - \cos x} dx = x + 2 \sin x + c$$



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10. Prove :

$$\int \frac{\sin^8 x - \cos^8 x}{1 - 2 \sin^2 x \cos^2 x} dx = -\frac{1}{2} \sin 2x + c$$



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11. Prove :

$$\int \sec^2 x \cos^2 2x dx = \tan x + \sin 2x - 2x + c$$

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12. Prove :

$$\int \frac{\cos^4 x}{\sin^2 x} dx = - \left(\frac{3x}{2} + \frac{1}{4} \sin 2x + \cot x \right) + c$$

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13. Prove :

$$\begin{aligned} & \int \sin mx \sin nx dx [m^2 \neq n^2], \\ &= \frac{1}{2} \left[\frac{\sin(m-n)x}{m-n} - \frac{\sin(m+n)x}{m+n} \right] + c \end{aligned}$$

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14. Find a function whose derivative is

$$\frac{x^4 - 1}{x(x - 1)}$$



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15. Prove :

Find a function whose derivative is

$$2^{2x-1} + 2^{1-2x}$$



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Sample Questions For Competitive Examination Multiple Correct Answer Type

1. $\int \frac{x^2 + \cos^2 x}{x^2 + 1} \operatorname{cosec}^2 x dx$ is equal to -

A. $\cot x - \cot^{-1} x + c$

B. $c - \cot x + \cot^{-1} x$

C. $-\tan^{-1} x - \frac{\cosec x}{\sec x} + c$

D. $-e^{\log \tan^{-1} x - \cot x + c}$

Answer: B::C::D



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2. If $\int \sin x d(\sec x) = f(x) - g(x) + c$, then $f(x) = \sec x$ (b)

$f(x) = \tan x$ $g(x) = 2x$ (d) $g(x) = x$

A. $f(x) = \sec x$

B. $f(x) = \tan x$

C. $g(x) = 2x$

D. $g(x) = x$

Answer: B::D



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3.

If

$$I = \int \sec^2 x \cosec^4 x dx = A \cot^3 x + B \tan x + C \cot x + D,$$

A. $A = -\frac{1}{3}$

B. $B=2$

C. $C = -2$

D. none of these

Answer: A::C



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4. If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = A f(x) + B$, then -

A. $A = -\frac{1}{8}$

B. $B = \frac{1}{2}$

C. $f(x)$ has fundamental period $\frac{\pi}{2}$

D. $f(x)$ is an odd function

Answer: A::C



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5. If $f(x) = \int \frac{x^8 + 4}{x^4 - 2x^2 + 2} dx$ and $f(0) = 0$, then $f(x)$ is an odd function $f(x)$ has range R $f(x)$ has at least one real root $f(x)$ is a monotonic function.

A. $f(x)$ is an odd function

B. $f(x)$ has range R

C. $f(x)$ has at least one real root

D. $f(x)$ is monotonic function

Answer: A::B



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Sample Questions For Competitive Examination Integral Answer Type

1. If $\int \sin 2x \sin 3x dx = \frac{\sin x}{2} - \frac{\sin kx}{10} + c$ then the value of k is -



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2. If $\int \frac{dx}{1 + \sin x} = \tan\left(\frac{x}{2} - \frac{\pi}{\lambda}\right) + b$, then the value of λ is -



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3. If $\int \frac{dx}{(2x - 7)\sqrt{(x - 3)(x - 4)}} = \frac{1}{k} \sec^{-1}(2x - 7) + c$, then
the value of k is -



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4. If $\int \frac{\cos^4 x}{\sin^2 x} dx = -k\left(\frac{x}{2} + \frac{1}{12}\sin 2x + \frac{1}{3}\cot x\right) + c$, then
the value of k is -



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5. If $\int \frac{2x^3 - 7x + 2}{x^3 + 2x^2} dx = 2x - n \log|x| - \frac{1}{x} + c$ then the value of n is -



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Sample Questions For Competitive Examination Matrix Match Type

1.

Let

$$f(x) = \tan^{-1}\left(\frac{1 + \cos x}{\sin x}\right) \text{ and } g(x) = \tan^{-1}\left(\frac{\sin x}{1 - \cos x}\right)$$
$$\int \{f(x) + g(x)\} dx =$$

A. $\frac{\pi x}{2} - \frac{x^2}{4} + c$

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

C. $\frac{\pi x}{2} + \frac{x^2}{4} + c$

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

Answer: B



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2.

Let

$$f(x) = \tan^{-1} \left(\frac{1 + \cos x}{\sin x} \right) \text{ and } g(x) = \tan^{-1} \left(\frac{\sin x}{1 - \cos x} \right)$$
$$\int \{f(x) - g(x)\} dx =$$

A. $\pi x + c$

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

C. 0

D. $\pi x + x^2 + c$

Answer: C



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Sample Questions For Competitive Examination Comprehension Type

1.

Let

$$f(x) = \tan^{-1} \left(\frac{1 + \cos x}{\sin x} \right) \text{ and } g(x) = \tan^{-1} \left(\frac{\sin x}{1 - \cos x} \right)$$
$$\int f(x) dx =$$

A. $\frac{\pi x}{2} - \frac{x^2}{4} + c$

B. $\pi x - \frac{x^2}{4} + c$

C. $\pi x + \frac{x^2}{4} + c$

D. none of these

Answer: A



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2. Let $f(x) = \cos 7x \cos 3x$ and $g(x) = \sin 7x \sin 3x$

$$\int f(x) dx =$$

A. $\frac{1}{4} \sin 4x + \frac{1}{10} \sin 10x + c$

B. $\frac{1}{8} \sin 4x + \frac{1}{20} \sin 10x + c$

C. $\frac{1}{8} \sin 4x + \frac{1}{20} \sin 10x + c$

D. none of these

Answer: B



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3. Let $f(x) = \cos 7x \cos 3x$ and $g(x) = \sin 7x \sin 3x$

$$\int g(x) dx =$$

A. $\frac{1}{8} \sin 4x - \frac{1}{20} \sin 10x + c$

B. $\frac{1}{4}\sin 4x - \frac{1}{10}\sin 10x + c$

C. $\frac{1}{4}\sin 4x + \frac{1}{20}\sin 10x + c$

D. $\frac{1}{4}\sin 4x + \frac{1}{10}\sin 10x + c$

Answer: A



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4. Let $f(x) = \cos 7x \cos 3x$ and $g(x) = \sin 7x \sin 3x$

$$\int \{f(x) + g(x)\} dx =$$

A. $\frac{1}{8}\sin 4x + c$

B. $\frac{1}{10}\sin 10x + c$

C. $\frac{1}{4}\sin 4x + c$

D. $\frac{1}{20}\sin 10x + c$

Answer: C



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5. Statement - I: $\int \frac{\sin x}{x} dx (x > 0)$ can not be evaluated .

Statement - II : Only differentiable functions can be integrated .

A. Statement - I is True , Statement - II is True , Statement - II

is a correct explanation for Statement -I

B. Statement - I is True , Statement - II is True , Statement - II

is not a correct explanation fo Statement - I

C. Statement - I is True , Statement - II is False

D. Statement - I is False , Statement - II is True .

Answer: B



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6. Let $F(x)$ be an indefinite integral of $\sin^2 x$

Statement - I : The function $F(x)$ satisfies $F(x + \pi) = F(x)$ for all real x

Statement - II : $\sin^2(\pi + x) = \sin^2 x$ for all real x

A. Statement - I is True , Statement - II is True , Statement - II

is a correct explanation for Statement -I

B. Statement - I is True , Statement - II is True , Statement - II

is not a correct explanation fo Statement - I

C. Statement - I is True , Statement - II is False

D. Statement - I is False , Statement - II is True .

Answer: D



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