MATHS

BOOKS - JMD MATHS (PUNJABI ENGLISH)

Integrals

Exercise

1. $\int (\cos x + \sin x)\, dx$ is equal to :

A. $\cos x - \sin x + C$

B. $\cos x + \sin x + C$

C. $-\cos x + \sin x + C$

D. $-\cos x - \sin x + C$

Answer:

2. Select the correct answer : $\int \tan^2 x \, dx$

A. $\sec^2 x + C$

B. $\sec x + C$

C. $\tan x - x + C$

D. $\sec x - x + C$

Answer:

3. Select the correct answer : $\int \dfrac{dx}{3x - 2}$

A. $\dfrac{1}{3}\log|3x - 2| + c$

B. $\log|3x - 2| + c$

C. $\dfrac{1}{(3x-2)^2} + C$

D. $3\log|3x - 2| + C$

Answer:

4. Select the correct answer : $\displaystyle\int \dfrac{dx}{x\sqrt{x^2 - 1}}$

A. $\log\left|x + \sqrt{x^2 - 1}\right| + C$

B. $\cos^{-1} x + C$

C. $\cos ec^{-1} x + C$

D. $\tan^{-1}\left(\sqrt{x^2 - 1}\right) + C$

Answer:

5. Select the correct answer :

$$\int e^x \left(\tan x + \sec^2 x\right) dx$$

A. $e^x \tan x + C$

B. $e^x \sec^2 x + C$

C. $e^x \sin x + C$

D. $e^x \cos x + C$

Answer:

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6. Select the correct answer : $\displaystyle\int e^{4\log x}\,dx$

A. $e^{4\log x} + C$

B. $4e^{4\log x} + C$

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

D. $\dfrac{1}{4}e^{4\log x} + C$

Answer:

7. Select the correct answer : $\int \dfrac{dx}{x \log x}$

A. $\log x + C$

B. $\log(\log x) + C$

C. $x + C$

D. $(\log x)^2 + C$

Answer:

8. Select the correct answer :

$$\int_{-2}^{2} \left(\sin x + x^3 \right) dx$$

A. 2

B. 1

C. 0

D. -2

Answer:

9. Select the correct answer : Find a if

$$\int_0^a 3x^2\,dx = 8$$

A. 3

B. 1

C. 2

D. 0

Answer:

10. Select the correct answer : $\int_{1}^{2} \dfrac{x\,dx}{x^2 + 1}$

A. $\log\left(\dfrac{5}{2}\right)$

B. $\dfrac{1}{2}\log 5$

C. $\dfrac{1}{2}\log\left(\dfrac{5}{2}\right)$

D. $\dfrac{1}{2}\log 2$

Answer:

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11. Fill in the blanks : `int(sinx)/(cox^2x)dx =

....

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12. Fill in the blanks : $\int \dfrac{2dx}{1 - \cos 2x}$=.................. .

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13. Fill in the blanks : $\int \tan^2 x\, dx$ =.................. .

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14. Fill in the blanks : $\int \cos ecx\,dx =$ ....

15. Fill in the blanks : $\int \dfrac{dx}{9x^2 - 4} =$ ....

16. State True/ False : The value of $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin^5 x\,dx$ is 0.

17. State True/ False : The value of $\int e^{3\log x} x^4 dx$

is $e^{3\log x} + C$.

18. Fill in the blanks : $\int \dfrac{2dx}{1 - \cos 2x}$ =................ .

19. Evalute $\int \dfrac{1 + \tan x}{1 - \tan x} dx$

20. Evalute $\int \dfrac{dx}{32 - 2x^2}$

21. Prove that $\displaystyle\int_0^{\frac{\pi}{2}} \sin 2x \log \tan x \, dx = 0$

22. Evalute $\int \sqrt{x^2 + 8x + 4}dx$

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23. Evalute $\int \dfrac{1 - \sin 2x}{x + \cos^2 x}dx$

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24. Evaluate $\int \dfrac{dx}{1 + \sin x}$

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25. Prove that $\displaystyle\int_0^a f(x)dx = \int_0^a f(a-x)dx$

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26. Evalute $\displaystyle\int \dfrac{dx}{\sqrt{7-6x-x^2}}$

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27. Evalute $\displaystyle\int \sin 5x \sin 3x\, dx$

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28. Evalute $\int \dfrac{\sin\left(2\tan^{-1}x\right)}{1+x^3}\,dx$

29. Evalute $\int \dfrac{dx}{\sqrt{15-8x^2}}$

30. Evalute $\int \dfrac{x^4+1}{x^2+1}\,dx.$

31. Evalute $\displaystyle \int \frac{dx}{\sqrt{16 - 2x - 2x^2}}$

32. Evalute $\displaystyle \int x \tan^{-1} x\, dx$

33. Evalute `int_0^(pi/4) 2tan^3xdx'`

34. Evalute $\int \sec^3 x\, dx$

35. Prove that if f is an odd function, then $\int_{-a}^{a} f(x)\, dx = 0.$ Use it to evaluate $\int_{-1}^{1} \log\left(\frac{2+x}{2-x}\right) dx$

36. Evalute $\int \frac{\sin(x-\alpha)}{\sin(x+\alpha)}$

37. Evalualte : $\int e^x \left(\dfrac{x^2 + 1}{(x + 1)^2} \right) dx.$

38. If $\int (e^{ax} + bx) dx = e^{4x} 4 + \dfrac{3x^2}{2}$ find the value of a and b.

39. By using the properties of definite integrals, evaluate the integral:

$$\int_0^2 x\sqrt{2-x}\,dx$$

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40. Write the value of

$$\int_0^{\frac{\pi}{2}} \log\left[\frac{3+5\cos x}{3+5\sin x}\right] dx$$

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41. Evalute : $\int \dfrac{\sin x + \cos x}{\sqrt{1 - (\sin x - \cos x)^2}} dx$

42. Evalute: $\int_0^1 \dfrac{1}{\sqrt{2x + 3}} dx$

43. Evaluate $\int \dfrac{e^{\tan^{-1} x}}{1 + x^2} dx$

44. Evalute : $\displaystyle\int_{e}^{e^2} \frac{dx}{x \log x}$

45. Evalute : $\displaystyle\int_{0}^{a} \frac{1}{4 + x^2} dx = \frac{\pi}{8}$, find the value a.

46. If $\displaystyle\int_{0}^{a} 3x^2 dx = 8$, write the value of a.

47. Evalute : $\int \dfrac{\tan^{-1} x}{1 + x^2} \, dx$

48. Evalute : $\displaystyle\int_0^{\frac{\pi}{2}} \dfrac{\sin 2x}{\sin^4 x + \cos^4 x}$

49. Evaluate : $\displaystyle\int_0^{\frac{\pi}{2}} \dfrac{x}{\sin x + \cos x} \, dx.$

50. Evalute : $\int_0^\pi \dfrac{dx}{5 + 4\cos x}$

51. Evaluate $\int_{\pi/6}^{\pi/3} \left(\dfrac{1}{1 + \sqrt{\tan x}} \right) dx$

52. Evalute : $\int \dfrac{2x + 1}{4 - 3x - x^2} dx$

53. Evalute : $\int \dfrac{x^2 + 4}{x^4 + 16} dx$

54. Evalute : $\int_0^1 \dfrac{\log(1 + x)}{1 + x^2} dx$

55. Evalute : $\int \dfrac{(x-4)e^x}{(x-2)^3} dx$

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56. Evaluate : $\int e^x \left(\dfrac{\sin 4x - 4}{1 - \cos 4x} \right) dx.$

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57. Evalute : $\int_0^\pi \dfrac{x dx}{a^2 \cos^2 x + b^2 \sin^2 x}$

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58. Find $\int \left(\sin^{-1} x \right)^2 dx$

59. Evalute : $\int \dfrac{1 - x^2}{x(1 - 2x)} dx$

60. Evalute : $\int \sin^4 x\, dx$

61. Evalute : $\int \dfrac{5x + 3}{\sqrt{x^2 + 4x + 10}} dx$

62. Evalute : $\int_1^4 \left(x^2 - x\right) dx$ using limit of sum.

63. Evalualte : $\int \dfrac{2x}{(x^2 + 1)(x^2 + 3)} dx.$

64. Evaluate : $\int_0^{\frac{\pi}{4}} \log(1 + \tan x)dx$, using properties of definite integrals.

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65. Find : $\int \frac{x^2 + x + 1}{(x^2 + 1)(x + 2)}dx$

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66. Evalute : $\int \dfrac{x^2}{(x^2 + 4)(x^2 + 9)}\,dx$

67. Evalute : $\int (x - 3)\sqrt{x^2 + 3x - 18}\,dx$

68. Find : $\int \dfrac{(3\sin\theta - 2)\cos\theta}{5 - \cos^2\theta - 4\sin\theta}\,d\theta$

69. Evalute : $\int \dfrac{x^2 + 4}{x^4 + x^2 + 16} dx$

70. Evalute : $\int \dfrac{(x^2 + 1)(x^2 + 4)}{(x^2 + 3)(x^2 - 5)} dx$