



MATHS

BOOKS - PSEB

INTEGRALS

Example

1. Write an anti derivative for each of the following functions using the method of inspection: $\cos(2x)$



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2. Write an anti derivative for each of the following functions using the method of inspection: $3x^2 + 4x^3$

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3. Write an anti derivative for each of the following functions using the method of inspection: $\left(\frac{1}{x}\right), x \neq 0$

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4. Find the following integrals: $\int \frac{x^3 - 1}{x^2} dx$

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5. Find the following integrals: $\int \left(x^{\frac{2}{3}} + 1\right) dx$

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6. Find the following integrals: $\int \left(x^{\frac{2}{3}} + 2e^x - \left(\frac{1}{x}\right)\right) dx$

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7. Find the following integrals: $\int (\sin x + \cos x) dx$

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8. Find the following integrals: $\int \cos ecx (\cos ecx + \cot x) dx$

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9. Find the following integrals: $\int \frac{1 - \sin x}{\cos^2 x} dx$

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10. Find the anti derivative F of f defined by $f(x) = 4x^3 - 6$, where $F(0) = 3$

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11. Integrate the following functions w.r.t. x : $\sin mx$

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12. Integrate the following functions w.r.t. x : $2x \sin(x^2 + 1)$

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13. Integrate the following functions w.r.t. x : $\frac{\tan^4 \sqrt{x} \sec^2 \sqrt{x}}{\sqrt{x}}$

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14. Integrate the following functions w.r.t. x : $\frac{\sin(\tan^{-1} x)}{1 + x^2}$

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15. Find the following integral: $\int \sin^3 x \cos^2 x dx$

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16. Find the following integral: $\int \frac{\sin x}{\sin(x+a)} dx$

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17. Find the following integral: $\int \frac{1}{1 + \tan x} dx$

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18. Find : $\int \cos^2 x dx$

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19. Find : $\int \sin 2x \cos 3x dx$

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20. Find: $\int \sin^3 x dx$

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21. Find the following integral: $\int \frac{dx}{x^2 - 16}$

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22. Find the following integral: $\int \frac{dx}{\sqrt{2x - x^2}}$

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23. Find the following integral: $\int \frac{dx}{x^2 - 6x + 13}$

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24. Find the following integral: $\int \frac{dx}{3x^2 + 13x - 10}$

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25. Find the following integral: $\int \frac{dx}{\sqrt{5x^2 - 2x}}$

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26. Find the following integral: $\int \frac{x + 2}{2x^2 + 6x + 5} dx$

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27. Find the following integral: $\int \frac{x + 3}{5 - 4x - x^2} dx$

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

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29. Find: $\int \frac{x^2 + 1}{x^2 - 5x + 6} dx$

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30. Find: $\int \frac{3x - 2}{(x + 1)^2(x + 3)} dx$

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31. Find: $\int \frac{x^2}{(x^2 + 1)(x^2 + 4)} dx$

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32. Find: $\int \frac{(3 \sin \phi - 2) \cos \phi}{5 - \cos^2 \phi - 4 \sin \phi} d\phi$

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33. $\int \frac{x^2 + x + 1}{(x + 2)(x^2 + 1)} dx$ ਦਾ ਮੁੱਲ ਪਤਾ ਕਰੋ।

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34. Find: $\int x \cos x dx$

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35. Find: $\int \log x dx$

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36. Find: $\int x e^x dx$

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37. Find: $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

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38. Find: $\int e^x \sin x dx$

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39. Evaluate $\int e^x \left(\tan^{-1} x + \frac{1}{(1+x^2)} \right) dx$.

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

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41. Find: $\int \sqrt{x^2 + 2x + 5} dx$

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42. Find: $\int \sqrt{3 - 2x - x^2} dx$

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43. Evaluate : $\int_0^2 (x^2 + 1) dx$ as limit of a sum.

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44. Evaluate, $\int_0^2 e^x dx$ as the limit of sums.

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45. Evaluate the following integral : $\int_2^3 x^2 dx$

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46. Evaluate the following integral : $\int_4^9 \frac{\sqrt{x}}{(30 - x^{\frac{3}{2}})^2} dx$

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47. Evaluate the following integral: $\int_1^2 \frac{x dx}{(x+1)(x+2)}$

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48. Evaluate the following integral: $\int_0^{\frac{\pi}{4}} \sin^3(2t) \cos(2t) dt$

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49. Evaluate: $\int_{-1}^1 (5x^4 \sqrt{x^5 + 1}) dx$

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50. Evaluate: $\int_0^1 \frac{\tan^{-1} x}{1+x^2} dx$

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51. Evaluate: $\int_{-1}^2 |x^3 - x| dx$

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52. Evaluate: $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \sin^2 x dx$

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53. Evaluate : $\int_0^{\pi} \frac{x \sin x}{1 + \cos^2 x} dx.$

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54. Evaluate: $\int_{-1}^1 \sin^5 x \cos^4 x dx$

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55. Evaluate : $\int_0^{\frac{\pi}{2}} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx.$

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

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57. Evaluate : $\int_0^{\frac{\pi}{2}} \log \sin x dx.$

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58. Find: $\int \cos 6x \sqrt{1 + \sin 6x} dx$

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59. Find: $\int \frac{(x^4 - x)^{\frac{1}{4}}}{x^5} dx$

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

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61. Evaluate: $\int \left[\log(\log x) + \frac{1}{(\log x)^2} \right] dx.$

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62. Evaluate: $\int (\sqrt{\tan x} + \sqrt{\cot x}) dx.$

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63. Find: $\int \frac{\sin 2x \cos 2x}{\sqrt{9 - \cos^4(2x)}} dx$

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64. Evaluate: $\int_{-1}^{\frac{3}{2}} |x \sin(\pi x)| dx$

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65. Evaluate: $\int_0^{\pi} \frac{x dx}{a^2 \cos^2 x + b^2 \sin^2 x}$

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Exercise

1. Find an anti derivative (or integral) of the following functions by the method of inspection: $\sin(2x)$

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2. Find an anti derivative (or integral) of the following functions by the method of inspection : $\cos(3x)$

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3. Find an anti derivative (or integral) of the following functions by the method of inspection : e^{2x}

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4. Find an anti derivative (or integral) of the following functions by the method of inspection : $(ax + b)^2$

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5. Find an anti derivative (or integral) of the following functions by the method of inspection : $\sin 2x - 4e^{3x}$

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6. Find the following integral: $\int(4e^{3x} + 1)dx$

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7. Find the following integral : $\int x^2 \left(1 - \left(\frac{1}{x^2} \right) \right) dx$

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8. Find the following integral : $\int(ax^2 + bx + c)dx$

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9. Find the following integral : $\int(2x^2 + e^x)dx$

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10. Find the following integral : $\int\left(\left(\sqrt{x} - \left(\frac{1}{\sqrt{x}}\right)\right)^2\right)dx$

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11. Find the following integral : $\int\frac{x^3 + 5x^2 - 4}{x^2}dx$

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12. Find the following integral : $\int \left(\frac{x^3 + 3x + 4}{\sqrt{x}} \right) dx$

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13. Find the following integral : $\int \left(\frac{x^3 - x^2 + x - 1}{x - 1} \right) dx$

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14. Find the following integral : $\int ((1 - x)\sqrt{x}) dx$

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15. Find the following integral : $\int (\sqrt{x}(3x^2 + 2x + 3)) dx$

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16. Find the following integral : $\int(2x - 3 \cos x + e^x)dx$

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17. Find the following integral : $\int(2x^2 - 3 \sin x + 5\sqrt{x})dx$

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18. Find the following integral : $\int \sec x(\sec x + \tan x)dx$

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19. Find the following integral : $\int \frac{\sec^2(x)}{\cos e^{c^2}(x)}dx$

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20. Find the following integral : $\int \frac{2 - 3 \sin x}{\cos^2(x)} dx$

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21. Choose the correct answer : The anti derivative of

$\left(\sqrt{x} + \left(\frac{1}{\sqrt{x}} \right) \right)$ equals.

A. $\left(\frac{1}{3} \right) x^{\frac{1}{3}} + 2x^{\frac{1}{2}} + C$

B. $\left(\frac{2}{3} \right) x^{\frac{2}{3}} + \left(\frac{1}{2} \right) x^2 + C$

C. $\left(\frac{2}{3} \right) x^{\frac{3}{2}} + 2x^{\frac{1}{2}} + C$

D. $\left(\frac{3}{2} \right) x^{\frac{3}{2}} + \left(\frac{1}{2} \right) x^{\frac{1}{2}} + C$

Answer:

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22. If $\left(\frac{d}{dx}\right)f(x) = 4x^3 - \frac{3}{x^4}$ such that $f(2) = 0$. Then $f(x)$ is

A. $x^4 + \left(\frac{1}{x^3}\right) - \frac{129}{8}$

B. $x^4 + \left(\frac{1}{x^4}\right) + \frac{129}{8}$

C. $x^4 + \left(\frac{1}{x^3}\right) + \frac{129}{8}$

D. $x^4 + \left(\frac{1}{x^4}\right) - \frac{129}{8}$

Answer:

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23. Integrate the function: $2\frac{x}{1+x^2}$

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24. Integrate the function: $\frac{(\log x)^2}{x}$

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25. Integrate the function: $\frac{1}{x + x \log x}$

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26. Integrate the function: $\sin x \sin(\cos x)$

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27. Integrate the function: $\sin(ax + b)\cos(ax + b)$

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28. Integrate the function: $\sqrt{ax + b}$

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29. Integrate the function: $x\sqrt{x+2}$

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30. Integrate the function: $x\sqrt{1+2x^2}$

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31. Integrate the function: $(4x+2)\sqrt{x^2+x+1}$

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32. Integrate the function: $\frac{1}{x-\sqrt{x}}$

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33. Integrate the function: $\frac{x}{\sqrt{x+4}}$, $x > 0$

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34. Integrate the function: $(x^3 - 1)^{\frac{1}{3}} x^5$

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35. Integrate the function: $\frac{x^2}{(2 + 3x^3)^3}$

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36. Integrate the function: $\frac{x}{9 - 4x^2}$

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37. Integrate the function: e^{2x+3}

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38. Integrate the function: $\frac{x}{e^{x^2}}$

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39. Integrate the function: $\frac{e^{\tan^{-1}x}}{1+x^2}$

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40. Integrate the function: $\frac{e^{2x} - 1}{e^{2x} + 1}$

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41. Integrate the function: $\frac{e^{2x} - e^{-2x}}{e^{2x} + e^{-2x}}$

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42. Integrate the function: $\tan^2(2x - 3)$

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43. Integrate the function: $\sec^2(7 - 4x)$

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44. Integrate the function: $\frac{\sin^{-1} x}{\sqrt{1 - x^2}}$

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45. Integrate the function: $\frac{2 \cos x - 3 \sin x}{6 \cos x + 4 \sin x}$

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46. Integrate the function: $\frac{1}{\cos^2 x (1 - \tan x)^2}$

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47. Integrate the function: $\frac{\cos \sqrt{x}}{\sqrt{x}}$

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48. Integrate the function: $\sqrt{\sin 2x} \cos 2x$

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49. Integrate the function: $\frac{\cos x}{\sqrt{1 + \sin x}}$

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50. Integrate the function: $\cot x \log \sin x$

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51. Integrate the function: $\frac{\sin x}{1 + \cos x}$

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52. Integrate the function: $\frac{\sin x}{(1 + \cos x)^2}$

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53. Integrate the function: $\frac{1}{1 + \cot x}$

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54. Integrate the function: $\frac{1}{1 - \tan x}$

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55. Integrate the function: $\frac{\sqrt{\tan x}}{\sin x \cos x}$

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56. Integrate the function: $\frac{(1 + \log x)^2}{x}$

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57. Integrate the function: $(x + 1) \frac{(x + \log x)^2}{x}$

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58. ਇਨਟੀਗਰਲ ਪਤਾ ਕਰੋ: $\frac{x^3 \sin(\tan^{-1} x^4)}{1 + x^8}$

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59. $\int \frac{10x^9 + 10^x \log_e 10}{x^{10} + 10^x} dx$ is equal to :

A. $10^x - x^{10} + C$

B. $10^x + x^{10} + C$

C. $(10^x - x^{10})^{-1} + C$

D. $\log(10^x + x^{10}) + C$

Answer:



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60. $\int \frac{dx}{\sin^2 x \cos^2 x}$ equals :

A. $\tan x + \cot x + C$

B. $\tan x - \cot x + C$

C. $\tan x \cot x + C$

D. $\tan x - \cot 2x + C$

Answer:



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61. Find the integrals of the function: $\sin^2(2x + 5)$



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62. Find the integrals of the function: $\sin 3x \cos 4x$

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63. Find the integrals of the function: $\cos 2x \cos 4x \cos 6x$

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64. Find the integrals of the function: $\sin^3(2x + 1)$

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65. Find the integrals of the function: $\sin^3 x \cos^3 x$

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66. Find the integrals of the function: $\sin x \sin 2x \sin 3x$

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67. Find the integrals of the function: $\sin 4x \sin 8x$

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68. Find the integrals of the function: $\frac{1 - \cos x}{1 + \cos x}$

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69. Find the integrals of the function: $\frac{\cos x}{1 + \cos x}$

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70. Find the integrals of the function: $\sin^4 x$

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71. Find the integrals of the function: $\cos^4(2x)$

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72. Find the integrals of the function: $\frac{\sin^2 x}{1 + \cos x}$

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73. Find the integrals of the function: $\frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha}$

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74. Find the integrals of the function: $\frac{\cos x - \sin x}{1 + \sin 2x}$

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75. Find the integrals of the function: $\tan^3(2x)\sec 2x$

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76. Find the integrals of the function: $\tan^4 x$

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77. Find the integrals of the function: $\frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}$

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78. Find the integrals of the function: $\frac{\cos 2x + 2 \sin^2 x}{\cos^2 x}$

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79. Find the integrals of the function: $\frac{1}{\sin x} \cdot \cos^3 x$

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80. Find the integrals of the function: $\frac{\cos 2x}{(\cos x + \sin x)^2}$

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81. Find the integrals of the function: $\sin^{-1}(\cos x)$

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82. Find the integrals of the function: $\frac{1}{\cos(x - a)\cos(x - b)}$

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83. $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx$ is equal to :

A. $\tan x + \cot x + C$

B. $\tan x + \operatorname{cosec} x + C$

C. $-\tan x + \cot x + C$

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

Answer:

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84. Choose the correct answer: $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$ is equal to:

A. $-\cot(ex^x) + C$

B. $\tan(xe^x) + C$

C. $\tan(e^x) + C$

D. $\cot(e^x) + C$

Answer:

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85. Integrate the functions: $\frac{3x^2}{x^6 + 1}$

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86. Integrate the functions: $\frac{1}{\sqrt{1 + 4x^2}}$

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87. Integrate the functions: $\frac{1}{\sqrt{(2-x)^2 + 1}}$

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88. $\int \frac{dx}{\sqrt{9 - 25x^2}}$

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89. Integrate the functions: $3 \frac{x}{1 + 2x^4}$

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90. Integrate the functions: $\frac{x^2}{1 - x^6}$

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91. Integrate the functions: $\frac{x - 1}{\sqrt{x^2 - 1}}$

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92. Integrate the functions: $\frac{x^2}{\sqrt{x^6 + a^6}}$

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93. Integrate the functions: $\frac{\sec^2 x}{\sqrt{\tan^2 x + 4}}$

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94. Integrate the functions: $\frac{1}{\sqrt{x^2 + 2x + 2}}$

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95. Integrate the functions: $\frac{1}{9x^2 + 6x + 5}$

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96. Integrate the functions: $\frac{1}{\sqrt{7 - 6x - x^2}}$

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97. Integrate the functions: $\frac{1}{\sqrt{(x - 1)(x - 2)}}$

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98. Integrate the functions: $\frac{1}{\sqrt{8 + 3x - x^2}}$

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99. Integrate the functions: $\frac{4x + 1}{\sqrt{2x^2 + x - 3}}$

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100. Integrate the functions: $\frac{x + 2}{\sqrt{x^2 - 1}}$

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101. Integrate the functions: $\frac{5x - 2}{1 + 2x + 3x^2}$

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102. Integrate the functions: $\frac{6x + 7}{\sqrt{(x - 5)(x - 4)}}$

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103. Integrate the functions: $\frac{x + 2}{\sqrt{4x - x^2}}$

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104. Integrate the functions: $\frac{x + 2}{\sqrt{x^2 + 2x + 3}}$

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105. Integrate the functions: $\frac{x + 3}{x^2 - 2x - 5}$

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106. Integrate the functions: $\frac{5x + 3}{\sqrt{x^2 + 4x + 10}}$

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107. Choose the correct answer: $\int \frac{dx}{\sqrt{9x - 4x^2}}$ equals:

A. $\frac{1}{9} \sin^{-1} \left(\frac{9x - 8}{8} \right) + C$

B. $\frac{1}{2} \sin^{-1} \left(\frac{8x - 9}{9} \right) + C$

C. $\frac{1}{3} \sin^{-1} \left(\frac{9x - 8}{8} \right) + C$

D. $\frac{1}{2} \sin^{-1} \left(\frac{9x - 8}{8} \right) + C$

Answer:

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108. Integrate the rational function: $\frac{x}{(x + 1)(x + 2)}$

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109. Integrate the rational function: $\frac{1}{x^2 - 9}$

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110. Integrate the rational function: $\frac{3x - 1}{(x - 1)(x - 2)(x - 3)}$

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111. Integrate the rational function: $\frac{x}{(x - 1)(x - 2)(x - 3)}$

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112. Integrate the rational function: $2\frac{x}{x^2 + 3x + 2}$

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113. Integrate the rational function: $\frac{1 - x^2}{x(1 - 2x)}$

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114. Integrate the rational function: $\frac{x}{(x^2 + 1)(x - 1)}$

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115. Integrate the rational function: $\frac{x}{(x - 1)^2(x + 2)}$

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116. Integrate the rational function: $\frac{3x + 5}{x^3 - x^2 - x + 1}$

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117. Integrate the rational function: $\frac{2x - 3}{(x^2 - 1)(2x + 3)}$

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118. Integrate the rational function: $5 \frac{x}{(x+1)(x^2-4)}$

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119. Integrate the rational function: $\frac{x^3 + x + 1}{x^2 - 1}$

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120. Integrate the rational function: $\frac{2}{(1-x)(1+x^2)}$

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121. Integrate the rational function: $\frac{3x-1}{(x+2)^2}$

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122. Integrate the rational function: $\frac{1}{x^4 - 1}$

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123. Integrate the rational function: $\frac{1}{x(x^n + 1)}$

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124. Integrate the rational function: $\frac{\cos x}{(1 - \sin x)(2 - \sin x)}$

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125. Integrate the rational function: $\frac{(x^2 + 1)(x^2 + 2)}{(x^2 + 3)(x^2 + 4)}$

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126. Integrate the rational function: $2 \frac{x}{(x^2 + 1)(x^2 + 3)}$

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127. Integrate the rational function: $\frac{1}{x(x^4 - 1)}$

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128. Integrate the rational function: $\frac{1}{e^x - 1}$

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129. Choose the correct answer: $\int x \frac{dx}{(x - 1)(x - 2)}$ equals:

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

B. $\log \left| \frac{(x - 2)^2}{x - 1} \right| + C$

$$C. \log \left| \left(\frac{x-1}{x-2} \right)^2 \right| + C$$

$$D. \log |(x-1)(x-2)| + C$$

Answer:

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

$$A. \log|x| - \frac{1}{2}\log(x^2+1) + C$$

$$B. \log|x| + \frac{1}{2}\log(x^2+1) + C$$

$$C. -\log|x| + \frac{1}{2}\log(x^2+1) + C$$

$$D. \frac{1}{2}\log|x| + \log(x^2+1) + C$$

Answer:

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131. Integrate the function : $x \sin x$

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132. Integrate the function : $x \sin 3x$

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133. Integrate the function : $x^2 e^x$

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134. Integrate the function : $x \log x$

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135. Integrate the function : $x \log x$

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136. Integrate the function : $x^2 \log x$

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137. Integrate the function : $x \sin^{-1} x$

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138. Integrate the function : $x \tan^{-1} x$

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139. Integrate the function : $x \cos^{-1} x$

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140. Integrate the function : $(\sin^{-1} x)^2$

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141. Integrate the function: $\frac{x \cos^{-1} x}{\sqrt{1-x^2}}$

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142. Integrate the function: $x \sec^2 x$

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143. Integrate the function: $\tan^{-1} x$

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144. Integrate the function: $x(\log x)^2$

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145. Integrate the function: $(x^2 + 1)\log x$

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146. Integrate the function: $e^x(\sin x + \cos x)$

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147. Integrate the function: $\frac{xe^x}{(1+x)^2}$

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148. Integrate the function: $e^x \left(\frac{1 + \sin x}{1 + \cos x} \right)$

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149. Integrate the function: $e^x \left(\frac{1}{x} - \frac{1}{x^2} \right)$

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150. Integrate the function: $\frac{(x-3)e^x}{(x-1)^3}$

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151. Integrate the function: $e^{2x} \sin x$

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152. Integrate the function: $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$

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153. Choose the correct answer: $\int x^2 e^{x^3} dx$ equals :

A. $\frac{1}{3}e^{x^3} + C$

B. $\frac{1}{3}e^{x^2} + C$

C. $\frac{1}{2}e^{x^3} + C$

D. $\frac{1}{2}e^{x^2} + C$

Answer:

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154. Choose the correct answer: $\int e^x \sec x (1 + \tan x) dx$ equals :

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

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

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

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

Answer:

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155. Integrate the function: $\sqrt{4 - x^2}$

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156. Integrate the function: $\sqrt{1 - 4x^2}$

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157. Integrate the function: $\sqrt{x^2 + 4x + 6}$

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158. Integrate the function: $\sqrt{x^2 + 4x + 1}$

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159. Integrate the function: $\sqrt{1 - 4x - x^2}$

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160. Integrate the function: $\sqrt{x^2 + 4x - 5}$

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161. Integrate the function: $\sqrt{1 + 3x - x^2}$

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162. Integrate the function: $\sqrt{x^2 + 3x}$

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163. Integrate the function: $\sqrt{1 + \frac{x^2}{9}}$

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164. Choose the correct answer: $\int \sqrt{1+x^2} dx$ is equal to:

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

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

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

D. $\frac{x^2}{2} \sqrt{1+x^2} + \frac{1}{2} x^2 \log \left| \left(x + \sqrt{1+x^2} \right) \right| + C$

Answer:

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165. Choose the correct answer: $\int \sqrt{x^2 - 8x + 7} dx$ is equal to:

A.

$$\frac{1}{2} (x-4) \sqrt{x^2 - 8x + 7} + 9 \log \left| x - 4 + \sqrt{x^2 - 8x + 7} \right| + C$$

B.

$$\frac{1}{2}(x+4)\sqrt{x^2-8x+7} + 9\log|x+4+\sqrt{x^2-8x+7}| + C$$

C.

$$\frac{1}{2}(x-4)\sqrt{x^2-8x+7} - 3\sqrt{2}\log|x-4+\sqrt{x^2-8x+7}| + C$$

D.

$$\frac{1}{2}(x-4)\sqrt{x^2-8x+7} + \frac{9}{2}\log|x-4+\sqrt{x^2-8x+7}| + C$$

Answer:

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166. Evaluate the following definite integral as limit of sum : $\int_a^b x dx$

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167. Evaluate the following definite integral as limit of sum :

$$\int_0^5 (x + 1) dx$$

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168. Evaluate the following definite integral as limit of sum :

$$\int_2^3 (x^2) dx$$

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169. Evaluate the following definite integral as limit of sum :

$$\int_1^4 (x^2 - x) dx$$

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170. Evaluate the following definite integral as limit of sum :

$$\int_{-1}^1 (e^x) dx$$

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171. Evaluate the following definite integral as limit of sum :

$$\int_0^4 (x + e^2 x) dx$$

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172. Evaluate the definite integral: $\int_{-1}^1 (x + 1) dx$

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173. Evaluate the definite integral: $\int_2^3 \left(\frac{1}{x}\right) dx$

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174. Evaluate the definite integral: $\int_1^2 (4x^3 - 5x^2 + 6x + 9) dx$

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175. Evaluate the definite integral: $\int_0^{\frac{\pi}{4}} (\sin 2x) dx$

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176. Evaluate the definite integral: $\int_0^{\frac{\pi}{2}} (\cos 2x) dx$

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177. Evaluate the definite integral: $\int_4^5 (e^x) dx$

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178. Evaluate the definite integral: $\int_0^{\frac{\pi}{4}} (\tan x) dx$

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179. Evaluate the definite integral: $\int_{\frac{\pi}{6}}^{\frac{\pi}{4}} (\cos ecx) dx$

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180. Evaluate the definite integral: $\int_0^1 \left(\frac{x dx}{1+x} \right)$

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181. Evaluate the definite integral: $\int_2^3 \left(\frac{dx}{x^2 - 1} \right)$

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182. Evaluate the definite integral: $\int_0^1 \frac{dx}{\sqrt{1-x^2}}$

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183. Evaluate the definite integral: $\int_0^{\frac{\pi}{2}} (\cos^2 x) dx$

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184. Evaluate the definite integral: $\int_2^3 \frac{x dx}{x^2 + 1}$

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185. Evaluate the definite integral: $\int_0^1 \frac{2x + 3}{5x^2 + 1} dx$

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186. Evaluate the definite integral: $\int_0^1 (xe^{x^2}) dx$

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187. Evaluate the definite integral: $\int_1^2 \frac{5x^2}{x^2 + 4x + 3} dx$

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188. Evaluate the definite integral: $\int_0^{\frac{\pi}{4}} (2\sec^2 x + x^3 + 2) dx$

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189. Evaluate the definite integral: $\int_0^{\pi} \left(\sin^2\left(\frac{x}{2}\right) - \cos^2\left(\frac{x}{2}\right) \right) dx$

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190. Evaluate the definite integral: $\int_0^2 \frac{6x + 3}{x^2 + 4} dx$

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191. Evaluate the definite integral: $\int_0^1 \left(xe^x + \sin\left(\frac{\pi x}{4}\right) \right) dx$

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192. $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ equals :

A. $\frac{\pi}{3}$

B. $2\frac{\pi}{3}$

C. $\frac{\pi}{6}$

D. $\frac{\pi}{12}$

Answer:

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193. Choose the correct answer: $\int_0^{\frac{2}{3}} \left(\frac{dx}{4 + 9x^2} \right)$ equals:

A. $\frac{\pi}{6}$

B. $\frac{\pi}{12}$

C. $\frac{\pi}{24}$

D. $\frac{\pi}{4}$

Answer:

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194. Evaluate the integral using substitution: $\int_0^1 \left(\frac{x}{x^2 + 1} \right) dx$

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195. Evaluate the integral using substitution: $\int_0^{\frac{\pi}{2}} \sqrt{\sin \phi \cos^5 \phi} d\phi$

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196. Evaluate the integral using substitution:

$$\int_0^1 \sin^{-1} \left(\frac{2x}{1+x^2} \right) dx$$

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197. Evaluate the integral using substitution: $\int_0^2 (\sqrt{x+2}) dx$

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198. Evaluate the integral using substitution: $\int_0^{\frac{\pi}{2}} \left(\frac{\sin x}{1 + \cos^2 x} \right) dx$

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199. Evaluate the integral using substitution: $\int_0^2 \left(\frac{dx}{x + 4 - x^2} \right)$

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200. Evaluate the integral using substitution: $\int_{-1}^1 \left(\frac{dx}{x^2 + 2x + 5} \right)$

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201. Evaluate the integral using substitution: $\int_1^2 \left(\frac{1}{x} - \frac{1}{2x^2} \right) e^{2x} dx$

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202. The value of the integral $\int_{\frac{1}{3}}^1 \frac{(x - x^3)^{\frac{1}{3}}}{x^4} dx$ is:

A. 6

B. 0

C. 3

D. 4

Answer:



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203. If $f(x) = \int_0^x t \sin t dt$, then $f'(x)$ is :

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

B. $x \sin x$

C. $x \cos x$

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

Answer:



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204. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{2}} \cos^2 x dx$

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205. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

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206. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{2}} \frac{\sin^{\frac{3}{2}} x}{\sin^{\frac{3}{2}} x + \cos^{\frac{3}{2}} x} dx$

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207. By using the properties of definite integrals, evaluate the

integral: $\int_{-5}^5 |x + 2| dx$

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208. By using the properties of definite integrals, evaluate the

integral: $\int_2^8 |x - 5| dx$

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209. By using the properties of definite integrals, evaluate the

integral: $\int_0^1 x(1 - x)^n dx$

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210. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{4}} \log(1 + \tan x) dx$

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211. By using the properties of definite integrals, evaluate the

integral: $\int_0^2 x \sqrt{2-x} dx$

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212. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{2}} (2 \log \sin x - \log \sin 2x) dx$

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213. By using the properties of definite integrals, evaluate the

integral:
$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (\sin^2 x) dx$$

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214. By using the properties of definite integrals, evaluate the

integral:
$$\int_0^{\pi} (x) \frac{dx}{1 + \sin x}$$

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215. By using the properties of definite integrals, evaluate the

integral:
$$\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (\sin^7 x) dx$$

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216. By using the properties of definite integrals, evaluate the

integral: $\int_0^{2\pi} (\cos^5 x) dx$

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217. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\frac{\pi}{2}} \frac{\sin x - \cos x}{1 + \sin x \cos x} dx$

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218. By using the properties of definite integrals, evaluate the

integral: $\int_0^{\pi} (\log(1 + \cos x)) dx$

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219. By using the properties of definite integrals, evaluate the

integral: $\int_0^a \frac{\sqrt{x}}{\sqrt{x} + \sqrt{a-x}} dx$

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220. By using the properties of definite integrals, evaluate the

integral: $\int_0^4 |x - 1| dx$

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221. Show that $\int_0^a f(x)g(x)dx = 2 \int_0^a f(x)dx$, if f and g are defined as $f(x) = f(a - x)$ and $g(x) + g(a - x) = 4$

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222. The value of $\int_{-\pi/2}^{\pi/2} (x^3 + x \cos x + \tan^5 x + 1) dx$ is :

A. 0

B. 2

C. π

D. 1

Answer:



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223. $\int_0^{\frac{\pi}{2}} \left(\frac{4 + 3 \sin x}{4 + 3 \cos x} \right) dx$ ਦਾ ਮੁੱਲ ਹੈ:

A. 2

B. $\frac{3}{4}$

C. 0

D. -2

Answer:

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224. Integrate the function: $\frac{1}{x - x^3}$

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225. Integrate the function: $\frac{1}{\sqrt{x+a} + \sqrt{x+b}}$

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226. Integrate the function: $\frac{1}{x\sqrt{ax - x^2}}$

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227. Integrate the function: $\frac{1}{x^2(x^4 + 1)^{\frac{3}{4}}}$

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228. Integrate the function: $\frac{1}{x^{\frac{1}{2}} + x^{\frac{1}{3}}}$

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229. Integrate the function: $\int \frac{x}{(x + 1)(x + 9)}$

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230. Integrate the function: $\frac{\sin x}{\sin(x - a)}$

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231. Integrate the function: $\frac{e^{5 \log x} - e^{4 \log x}}{e^{3 \log x} - e^{2 \log x}}$

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232. Integrate the function: $\frac{\cos x}{\sqrt{4 - \sin^2 x}}$

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233. Integrate the function: $\frac{\sin^8 x - \cos^8 x}{1 - 2 \sin^2 x \cos^2 x}$

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234. Integrate the function: $\frac{1}{\cos(x + a)\cos(x + b)}$

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235. Integrate the function: $\frac{x^3}{\sqrt{1-x^8}}$

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236. Integrate the function: $\frac{e^x}{(1+e^x)(2+e^x)}$

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237. Integrate the function: $\frac{1}{(x^2+1)(x^2+4)}$

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238. Integrate the function: $\cos^3 x e^{\log \sin x}$

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239. Integrate the function: $e^{3 \log x} (x^4 + 1)^{-1}$

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240. Integrate the function: $f'(ax + b)[f(ax + b)]^n$

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241. Integrate the function: $\frac{1}{\sqrt{\sin^3 x \sin(x + a)}}$

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242. Integrate the function: $\frac{\sin^{-1} \sqrt{x} - \cos^{-1} \sqrt{x}}{\sin^{-1} \sqrt{x} + \cos^{-1} \sqrt{x}}, (x \in [0, 1])$

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243. Integrate the function: $\sqrt{\frac{1 - \sqrt{x}}{1 + \sqrt{x}}}$

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244. Integrate the function: $\frac{2 + \sin 2x}{1 + \cos 2x} e^x$

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245. Integrate the function: $\frac{x^2 + x + 1}{(x + 1)^2(x + 2)}$

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246. Integrate the function: $\tan^{-1} \sqrt{\frac{1 - x}{1 + x}}$

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247. Integrate the function: $\frac{\sqrt{x^2 + 1} [\log(x^2 + 1) - 2 \log x]}{x^4}$

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248. Evaluate the definite integral: $\int_{\frac{\pi}{2}}^{\pi} e^x \left(\frac{1 - \sin x}{1 - \cos x} \right) dx$

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249. Evaluate the definite integral: $\int_0^{\frac{\pi}{4}} \frac{\sin x \cos x}{\cos^4 x + \sin^4 x} dx$

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250. Evaluate the definite integral: $\int_0^{\frac{\pi}{2}} \frac{\cos^2 x}{\cos^2 x + 4 \sin^2 x} dx$

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251. Evaluate the definite integral: $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$

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252. Evaluate the definite integral: $\int_0^1 \frac{dx}{\sqrt{1+x} - \sqrt{x}}$

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253. Evaluate the definite integral: $\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx$

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254. Evaluate the definite integral: $\int_0^{\frac{\pi}{2}} (\sin 2x \tan^{-1}(\sin x)) dx$

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255. Evaluate the definite integral: $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx$

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256. Evaluate the definite integral:

$$\int_1^4 (|x - 1| + |x - 2| + |x - 3|) dx$$

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257. $\int_1^3 \frac{dx}{x^2(x+1)} = \left(\frac{2}{3}\right) + \log\left(\frac{2}{3}\right)$ प्रमाणित करें।

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258. Prove the following: $\int_0^1 (xe^x) = 1$

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259. Prove the following: $\int_{-1}^1 (x^{17} \cos^4 x dx) = 0$

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260. $\int_0^{\frac{\pi}{2}} (\sin^3 x) dx = \frac{2}{3}$ प्रमाणित करें।

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261. Prove the following: $\int_0^{\frac{\pi}{4}} (2 \tan^3 x) dx = 1 - \log 2$

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262. Prove the following: $\int_0^1 (\sin^{-1} x) dx = \left(\frac{\pi}{2}\right) - 1$

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263. Evaluate $\int_0^2 e^{3x} dx$ as the limit of sums.

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

A. $\tan^{-1}(e^x) + C$

B. $\tan^{-1}(e^{-x}) + C$

C. $\log(e^x - e^{-x}) + C$

D. $\log(e^x + e^{-x}) + C$

Answer:

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265. $\int \left(\frac{\cos 2x}{(\sin x + \cos x)^2} \right) dx$ is equal to:

A. $\left(\frac{-1}{\sin x + \cos x}\right) + C$

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

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

D. $(1/(\sin x + \cos x)^2) + C$

Answer:

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266. If $f(a + b - x) = f(x)$, then $\int_a^b x f(x) dx$ is equal to:

A. $\left(\frac{a + b}{2}\right) \int_a^b f(b - x) dx$

B. $\left(\frac{a+b}{2}\right) \int_a^b f(b+x) dx$

C. $\left(\frac{b-a}{2}\right) \int_a^b f(x) dx$

D. $\left(\frac{a+b}{2}\right) \int_a^b f(x) dx$

Answer:



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267. The value of $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right) dx$ is:

A. 1

B. 0

C. -1

D. $\frac{\pi}{4}$

Answer:



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