



## MATHS

### BOOKS - CENGAGE

### INTEGRALS

#### Solved Examples And Exercises

1. Statement 1: For  $x > -1$



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2. If  $\int \frac{x^2 - x + 1}{(x^2 + 1)^{\frac{3}{2}}} e^x dx = e^x f(x) + c$ , then  $f(x)$  is an even function  $f(x)$  is a bounded function the range of  $f(x)$  is

$(0, 1)$   $f(x)$  has two points of extrema



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3. Evaluate: for  $m \in \mathbb{N}$ ,

$$\int x^{3m} + x^{2n} + x^m \left( 2x^{2m} + 3x^m + 6 \right)^{\frac{1}{m}} dx, x > 0$$



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4. Evaluate:  $\int \frac{(1 - x \sin x) dx}{x(1 - x^3 e^{3 \cos x})}$



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5.  $\int \frac{dx}{(2a - x - x^2)}$



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6. If  $f'(x) = \frac{1}{-x + \sqrt{x^2 + 1}}$  and  $f(0) = \frac{1 + \sqrt{2}}{2}$  then  $f(1)$

is equal to- (a)  $\log(\sqrt{2} + 1)$  (b) 1 (c)  $1 + \sqrt{2}$  (d) none of these

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7. The value of the integral  $\int (x^2 + x)(x^{-8} + 2x^{-9})^{\frac{1}{10}} dx$  is

$\frac{5}{11}(x^2 + 2x)^{\frac{11}{10}} + c$  (b)  $\frac{5}{6}(x + 1x)^{\frac{11}{10}} + c$  (c)  $\frac{6}{7}(x + 1)^{\frac{11}{10}} + c$  (d)

none of these

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8. If  $l'(x)$  means  $\log \log \log x$ , the log being repeated  $r$  times,

then  $\int [xl(x)l^2(x)l^3(x)l'(x)]^{-1} dx$  is equal to  $l^{r+1}(x) + C$

(b)  $\frac{l^{r+1}(x)}{r+1} + C$  (c)  $l^r(x) + C$  (d) none of these



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9.

$$\int \frac{2 \sin x}{(3 + \sin 2x)} dx \text{ is equal to } < o$$

$$\frac{1}{2} \ln \left| \frac{2 + \sin x - \cos x}{2 - \sin x + \cos x} \right| - \frac{1}{\sqrt{2}} \tan^{-1} \left( \frac{\sin x + \cos x}{\sqrt{2}} \right) + c$$

$$\frac{1}{2} \ln \left| \frac{2 + \sin x - \cos x}{2 - \sin x + \cos x} \right| - \frac{1}{2\sqrt{2}} \tan^{-1} \left( \frac{\sin x + \cos x}{\sqrt{2}} \right) + c$$

$$\frac{1}{4} \ln \left| \frac{2 + \sin x - \cos x}{2 - \sin x + \cos x} \right| - \frac{1}{\sqrt{2}} \tan^{-1} \left( \frac{\sin x + \cos x}{\sqrt{2}} \right) + c$$

none of these



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10. Evaluate:  $\int \frac{(x-1)e^x}{(x+1)^3} dx$



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11. Evaluate  $\int \frac{dx}{x^2(x^4 + 1)^{\frac{3}{4}}}$ .

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12.

If  $\int x \log\left(1 + \frac{1}{x}\right) dx = f(x)\log(x + 1) + g(x)x^2 + Ax + C$ ,  
then (a)  $f(x) = \frac{1}{2}x^2$  (b)  $g(x) = \log x$  (c)  $A = 1$  (d) none of

these

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13. If  $I = \int \frac{dx}{x^3\sqrt{x^2 - 1}}$ , then  $I$  equals a.

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

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

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

d.

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

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14. If  $I = \int e^{-x} \log(e^x + 1) dx$ , then equal

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15.

If  $I_{m,n} = \int \cos^m x \sin nx dx$ , then  $7I_{4,3} - 4I_{3,2}$  is equal to

(a) constant (b)  $-\cos^2 x + C$  (c)  $-\cos^4 x \cos 3x + C$  (d)

$\cos 7x - \cos 4x + C$

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

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17. If  $I = \int \sqrt{\frac{5-x}{2+x}} dx$ , then equal

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18. Evaluate:  $\int \left( \frac{1}{x^3 + x^4} + \left( \frac{\ln(1 + x^6)}{x^3 + \sqrt{x}} \right) \right) dx$

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

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20. If  $I = \int \frac{dx}{(a^2 - b^2 x^2)^{\frac{3}{2}}}$ , then  $I$  equal (a)

$\frac{x}{a^2 \sqrt{a^2 - b^2 x^2}} + C$  (b)  $\frac{x}{2\sqrt{a^2 - b^2 x^2}} + C$  (c)

$\frac{ax}{\sqrt{a^2 - b^2 x^2}} + C$  (d) none of these

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21.

$\int x \left( \left( \frac{\ln a^{\frac{x}{2}}}{3a^{\frac{5x}{2}} b^{3x}} + \frac{\ln b^{\hat{x}}}{2a^{2x} b^{4x}} \right) dx \right)$  (where  $a, b \in R^+$ ) is equal to

$\frac{1}{6 \ln a^2 b^3} a^{2x} b^{3x} \frac{\ln(a^{2x} b^{3x})}{e} + k$   $\frac{1}{6 \ln a^2 b^3} \frac{1}{a^{2x} b^{3x}} \frac{\ln 1}{e a^{2x} b^{3x}} + k$

$\frac{1}{6 \ln a^2 b^3} \frac{1}{a^{2x} b^{3x}} \ln(a^{2x} b^{3x}) + k$

$-\frac{1}{6 \ln a^2 b^3} \frac{1}{a^{2x} b^{3x}} \ln(a^{2x} b^{3x}) + k$

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22.  $\int e^{x^4} (x + x^3 + 2x^5) e^{x^2} dx$  is equal to  $\frac{1}{2} x e^{x^2} + \frac{1}{2} x^3 e^{x^2} + \frac{1}{2} x^5 e^{x^2} + C$

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

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

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24.  $\int \frac{x^4 - 1}{x^2 \sqrt{x^4 + x^2 + 1}} dx = \frac{\sqrt{x^4 + x^2 + 1}}{x^2} + C$  or  $\frac{\sqrt{x^4 + x^2 + 1}}{x} + C$  (d) none of these

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$$25. \int \frac{dx}{e^x \sqrt{2e^x - 1}} = 2 \sec^{-1} \sqrt{2e^x} + c - 2 \frac{\tan^{-1} 1}{\sqrt{2e - 1}} + c$$

$$2 \sec^{-1}(\sqrt{2e^x}) + c \quad (d) \quad (2\sqrt{2e^x-1})/2e^x$$

$$2 \tan^{-1} \sqrt{2e^x - 1} + c$$

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$$26. \text{ If } \int \sin x d(\sec x) = f(x) - g(x) + c, \text{ then } f(x) = \sec x$$

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

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$$27. \text{ Evaluate } \int \left( \frac{1 - \sqrt{x}}{1 + \sqrt{x}} \right)^{1/2} \cdot \frac{dx}{x}$$

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28.  $\int \frac{3 + 2 \cos x}{(2 + 3 \cos x)^2} dx$  is equal to  $\int \frac{2 \sin x}{3 \cos x + 2} dx + c$  (b)

$\left( \frac{2 \cos x}{3 \sin x + 2} \right) + c$  (c)  $\left( \frac{2 \cos x}{3 \cos x + 2} \right) + c$  (d)

$\left( \frac{2 \sin x}{3 \sin x + 2} \right) + c$

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29.  $\int \left( \frac{x+2}{x+4} \right)^2 + e^x dx$  is equal to  $e^x \left( \frac{x}{x+4} \right) + c$  (b)

$e^x \left( \frac{x+2}{x+4} \right) + c$  (c)  $e^x \left( \frac{x-2}{x+4} \right) + c$  (d)  $\left( \frac{2xe^2}{x+4} \right) + c$

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30.  $\int \frac{(x^2 + 1)}{(x + 1)^2} dx$  is equal to  $\left( \frac{x-1}{x+1} \right) e^x + c$  (b)

$e^x \left( \frac{x+1}{x-1} \right) + c$  (c)  $e^x (x+1)(x-1) + c$  (d) none of these

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31.  $\int x \sin x \sec^3 x dx$  is equal to

A. a)  $\frac{1}{2}[\sec^2 x - \tan x] + c$

B. b)  $\frac{1}{2}[x \sec^2 x - \tan x] + c$

C. c)  $\frac{1}{2}[x \sec^2 x + \tan x] + c$

D. d)  $\frac{1}{2}[\sec^2 x + \tan x] + c$

Answer: null



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32.  $\int \sqrt{e^x - 1} dx$  is equal to

$$2 \left[ \sqrt{e^x - 1} - \tan^{-1} \sqrt{e^x - 1} \right] + c$$
$$\sqrt{e^x - 1} - \tan^{-1} \sqrt{e^x - 1} + c$$

$$\sqrt{e^x - 1} + \tan^{-1} \sqrt{e^x - 1} + c$$

$$2 \left[ \sqrt{e^x - 1} - \tan^{-1} \sqrt{e^x - 1} \right] + c$$

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33.  $\int \frac{\ln\left(\frac{x-1}{x+1}\right)}{x^2 - 1} dx$  is equal to (a)  $\frac{1}{2} \left( \ln\left(\frac{x-1}{x+1}\right) \right)^2 + C$  (b)  $\frac{1}{2} \left( \ln\left(\frac{x+1}{x-1}\right) \right)^2 + C$  (c)  $\frac{1}{4} \left( \ln\left(\frac{x-1}{x+1}\right) \right)^2 + C$  (d)  $\frac{1}{4} \left( \ln\left(\frac{x+1}{x-1}\right) \right)^2 + C$

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34. Let  $g(x) = \int \frac{1 + 2 \cos x}{(\cos x + 2)^2} dx$  and  $g(0) = 0$ . then the value of  $8g\left(\frac{\pi}{2}\right)$  is \_\_\_\_\_

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35. Let  $k(x) = \int \frac{(x^2 + 1)dx}{(x^3 + 3x + 6)^{\frac{1}{3}}}$  and  $k(-1) = \frac{1}{2^{\frac{1}{3}}}$ . Then

the value of  $k(-2)$  is \_\_\_\_

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36. Column I a)  $\int \frac{x^2 - x + 1}{x^3 - 4x^2 + 4x} dx$  b)  $\int \frac{x^2 - 1}{x(x - 2)^3} dx$  c)

$\int \frac{x^3 + 1}{x(x - 2)^2} dx$  d)  $\int \frac{x^5 + 1}{x(x - 2)^3} dx$  COLUMN II (which of the

following functions appear in integration of functions in

column I) p)  $\log|x|$  q)  $\log|x - 2|$  r)  $\frac{1}{(x - 2)}$  s)  $x$

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37. Let

$$f(x) = \int x^{\sin x} (1 + x \cos x \ln x + \sin x) dx \text{ and } f\left(\frac{\pi}{2}\right) = \frac{\pi^2}{4}.$$

Then the value of  $|\cos(f(\pi))|$  is \_\_\_\_



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38. Evaluate  $\int \frac{dx}{5 + 4 \cos x} = a \tan^{-1} \left( b \tan \left( \frac{x}{2} \right) \right) + C$ , then



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39. Column I, Column II

$\int \frac{e^{2x} - 1}{e^{2x} + 1} dx$	$sequa < o$	, p.
$x - \log \left[ 1 + \sqrt{1 - e^{2x}} \right] + c$	$\int \frac{1}{(e^x + e^{-x})^2} dx$	$sequa < o$ , q.
$\log(e^x + 1) - x - e^{-x} + c$	$\int \frac{e^{-x}}{1 + e^x} dx$	$sequa < o$ , r.
$\log(e^{2x} + 1) - x + c$	$\int \frac{1}{\sqrt{1 - e^{2x}}} dx$	$sequa < o$ , s.
$-\frac{1}{2(e^{2x} + 1)} + c$		



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**40.** Statement 1: If the primitive of  $f(x) = \pi \sin \pi x + 2x - 4$  has the value  $-2f$  or  $x = 1$ , then there are exactly two values of  $x$  for which primitive of  $f(x)$  vanishes. Statement 2:  $\cos \pi x$  has period 2.

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**41.** Statement 1:  $\int \frac{\{f(x)\varphi'(x) - f'(x)\varphi(x)\}}{f(x)\varphi(x)}$   
 $-\log f(x)dx = \frac{1}{2} \left\{ \frac{\varphi(x)}{f(x)} \right\}^2 + c$  Statement 2 :  
 $\int (h(x))^n h'(x)dx = \frac{(h(x))^{n+1}}{n+1} + c$

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## 42. Integrate the functions

$$\frac{\sin^{-1} \sqrt{x} - \cos^{-1} \sqrt{x}}{\sin^{-1} \sqrt{x} + \cos^{-1} \sqrt{x}}, x \in [0, 1]$$

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43. If  $\int x^2 e^{-2x} dx = e^{-2x}(ax^2 + bx + c) + d$ , then the value of  $\left| \frac{a}{bc} \right|$  is \_\_\_\_\_

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44. If  $f(x) = \int \frac{3x^2 + 1}{(x^2 - 1)^3} dx$  and  $f(0) = 0$ , then the value of  $\left| \frac{2}{f(2)} \right|$  is \_\_\_

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45. Evaluate  $\int \left( \frac{1 - \sqrt{x}}{1 + \sqrt{x}} \right)^{1/2} \cdot \frac{dx}{x}$

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46. If  $\int x^5 (1 + x^3)^{\frac{2}{3}} dx = A(1 + x^3)^{\frac{8}{3}} + B(1 + x^3)^{\frac{5}{3}} + C$ ,

then (a)  $A = \frac{1}{4}, B = \frac{1}{5}$  (b)  $A = \frac{1}{8}, B = -\frac{1}{5}$

(c)  $A = -\frac{1}{8}, B = \frac{1}{5}$  (d) none of these

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47. The value of the integral  $\int \frac{(1 - \cos \theta)^{\frac{2}{7}}}{(1 + \cos \theta)^{\frac{9}{7}}} d\theta$  is

(a)  $\frac{7}{11} \left( \tan \frac{\theta}{2} \right)^{\frac{11}{7}} + C$  (b)  $\frac{7}{11} \left( \frac{\cos \theta}{2} \right)^{\frac{11}{7}} + C$

(c)  $\frac{7}{11} \left( s \int h \frac{\eta}{2} \right)^{\frac{11}{7}} + C$  (d) none of these

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48. Let  $f(x) = \int \frac{x^2 dx}{(1+x^2)(1+\sqrt{x^2+1})}$  and  $f(0) = 0$ .

Then value of  $f(1)$  will be  $\frac{7}{11} \left( \tan \frac{\theta}{2} \right)^{\frac{11}{7}} + C$  (b)

$\frac{7}{11} \left( \frac{\cos \theta}{2} \right)^{\frac{11}{7}} + C$   $\frac{7}{11} \left( \sinh \frac{\eta}{2} \right)^{\frac{11}{7}} + C$  (d) none of these

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49. If  $y = \int \sqrt{x} \left( 1 + x^{\frac{1}{3}} \right)^4 dx$  is equal to a)

$6(x+4/11x+6/18x^4/15+7x^4)+c$  b)  $8x^{3/4}$  c)

$6(x^{2/3}+4/11t^{11/6}+6/13t^{13/6}+4/15t^{5/2}+t^{17/17})+c$  d) none of these

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50.

If

$$\int \sqrt{1 + \sin x} f(x) dx = \frac{2}{3} (1 + \sin x)^{\frac{3}{2}} + c, \text{ then } f(x) \text{ equal}$$

cos  $x$  (b) sin  $x$  (c) tan  $x$  (d) 1



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51. Let  $\int e^x \{f(x) - f'(x)\} dx = \varphi(x)$ . Then  $\int e^x f(x) dx$  is

$\varphi(x) = e^x f(x)$

A.  $\varphi(x) - e^x f(x)$

B.  $\frac{1}{2} \varphi(x) + e^x f(x)$

C.  $\frac{1}{2} \varphi(x) + e^x f'(x)$

D. null

Answer: null



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52.  $\int \left( \frac{\sin(2x)}{\sin^4 + \cos^4 x} dx \right)$  is equal  $\rightarrow$

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53.  $\int \frac{\sec x}{\sqrt{2 \sin(x + A) \cos x}} .dx$

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54. Evaluate :  $\int \frac{x^2 + 20}{(x \sin x + 5 \cos x)^2} dx$

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55.  $\int \frac{x + 2}{(x^2 + 3x + 3)(\sqrt{x + 1})} . dx$



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56. Evaluate:  $\int \frac{1}{(1-x^2)\sqrt{1+x^2}} dx$



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57. Evaluate:  $\int \frac{1}{(x-3)\sqrt{x+1}} dx$



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58. Evaluate:  $\int \frac{x+1}{(x-1)\sqrt{x+2}} dx$



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59. Evaluate:  $\int \sec^3 x dx$

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

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61. Evaluate:  $\int \frac{1}{(x + 1)\sqrt{x^2 - 1}} dx$

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62. Evaluate:  $\int \frac{1}{(x^2 - 4)\sqrt{x + 1}} dx$

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63. Evaluate  $\int \frac{x}{(x^2 + 4)\sqrt{x^2 + 1}} dx$

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

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

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66.  $\int \sin^3 x \cos^5 x dx$





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67. Find  $\int \frac{dx}{\sin x \cos^3 x}$ .



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68.  $\int \frac{e^x(1+x)}{\cos^2(xe^x)} dx$  is



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69. Evaluate:  $\int \frac{\sin^3 x dx}{(\cos^4 x + 3 \cos^2 x + 1) \tan^{-1}(\sec x + \cos x)}$



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70. Evaluate  $\int \frac{e^{\sqrt{x}} \cos(e^{\sqrt{x}})}{\sqrt{x}} dx$ .

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71. Evaluate:  $\int \frac{\tan x}{a + b \tan^2 x} dx$

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72. Evaluate:  $\int \frac{1}{\sqrt{e^{5x}} (4\sqrt{e^{2x} + e^{-2x^3}})}$

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73. Find:  $\int \sin^5 x dx$

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74. Evaluate:  $\int \left( \left( \frac{e}{x} \right)^x + \left( \frac{x}{e} \right)^x \right) \ln x dx$ .

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75. Evaluate:  $\int \frac{x^2 - 1}{(x^4 + 3x^2 + 1)\tan^{-1}\left(x + \frac{1}{x}\right)} dx$

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76. Evaluate:  $\int \frac{x^2 + 4}{x^4 + 16} dx$

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77. Evaluate:  $\int \sqrt{\tan \theta} d\theta$



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78. Evaluate:  $\int \frac{x^2 + 1}{x^4 + 1} dx$



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



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80. Evaluate:  $\int \frac{1}{\sin^4 x + \cos^4 x} dx$



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81. Evaluate:  $\int [f(x)g^x - f^x g(x)] dx$



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



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83. Evaluate:  $\int x^3 d(\tan^{-1} x)$



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84. Evaluate:  $\int \sin^2(\log x) dx$



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85. Evaluate:  $\int \left( \frac{\cos x}{x} - \log x^{\sin x} \right) dx$ .

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86. Evaluate  $\int \frac{dx}{x^2(1+x^5)^{4/5}}$

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87. Evaluate:  $\int \frac{1+x^4}{(1-x^4)^{\frac{3}{2}}} dx$

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88. Evaluate:  $\int \frac{dx}{\sqrt[3]{\sin^{11} x \cos x}}$



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89. Evaluate:  $\int \frac{\sin x}{2 + \sin 2x} dx$



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90. Evaluate  $\int \frac{\log_e (x + \sqrt{x^2 + 1})}{\sqrt{x^2 + 1}} dx.$



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91. Evaluate  $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$



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92. Evaluate  $\int \frac{(x - x^3)^{1/3}}{x^4} dx$

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93. Evaluate:  $\int \frac{1}{\left[(x - 1)^3(x + 2)^5\right]^{1/4}} dx$

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94. Evaluate:  $\int \frac{x^3 + 1}{x^2 + x} dx$

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95. Evaluate: Evaluate:  $\int x^{-11} (1 + x^4)^{-\frac{1}{2}} dx$

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

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97. Evaluate:  $\int \frac{e^{2x} - 1}{e^{2x} + 1} dx.$

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98. Evaluate:  $\int \frac{\sin x}{\sin(x - a)} dx$

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99. Evaluate  $\int \sin(e^x) d(e^x).$



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100. Evaluate:  $\int \tan^3 x dx$



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101. Evaluate :  $\int \frac{\sin 2x}{a^2 + b^2 \sin^2 x} dx$



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102. Evaluate:  $\int \cos^3 x \sqrt{s \in} dx$



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103. Evaluate:  $\int \frac{dx}{x^{\frac{1}{2}} + x^{\frac{1}{3}}}$

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104. Evaluate  $\int 2^{2^{2^x}} 2^{2^x} 2^x dx$ .

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105. Evaluate  $\int \frac{e^x}{e^{2x} + 6e^x + 5} dx$

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106. The number of irrational roots of the equation  $4x / (x^2 + x + 3) + 5x / (x^2 - 5x + 3) = -3/2$  is 4 b. 0 c.

1 d. 2



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107. Evaluate:  $\int \sqrt{\frac{1+x}{x}} dx.$



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108. Evaluate:  $\int \frac{4x + 1}{x^2 + 3x + 2}$



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109. Evaluate:  $\int \frac{dx}{(a^2 + x^2)^{\frac{3}{2}}}$



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110. Evaluate:  $\int \frac{1}{x^2 \sqrt{1+x^2}} dx$

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111. Evaluate  $\int \frac{\sec^2 x dx}{\sqrt{\tan^2 x + 4}}$ .

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112. Evaluate  $\int \sqrt{\frac{x}{a^3 - x^3}} dx$

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113. Evaluate  $\int \frac{x^2}{\sqrt{1-x^6}} dx$

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114. Evaluate:  $\int \frac{[\sqrt{1+x^2} + x]^n}{\sqrt{1+x^2}} dx$

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115. Evaluate:  $\int \frac{dx}{(x-p)\sqrt{(x-p)(x-q)}}$

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116. Evaluate:  $\int \sec^5 x \cos ec^3 x dx$

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

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118. Integrate the functions

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

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119. Evaluate  $\int x^x \ln (ex) dx$

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120. Evaluate:  $\int \frac{x + 1}{(x - 1)\sqrt{x + 2}} dx$



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



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122. Find  $\int \frac{\sin^6 x}{\cos^8 x} dx$ .



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123. Evaluate  $\int \sin 2x d(\tan x)$ .



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124. Evaluate:  $\int \frac{1}{\sqrt{3} \sin x + \cos x} dx$

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125. Evaluate:  $\int \frac{1}{\sin(x-a)\sin(x-b)} dx$

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126. Evaluate  $\int (1 + 2x + 3x^2 + 4x^3 + \dots) dx, (0 < |x| < 1)$

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127. Evaluate  $\int \frac{dx}{x + x \log x}$

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128. Evaluate  $\int \sec^p x \tan x dx$ .

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129. Evaluate:  $\int \cos e c^4 x dx$

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130. Evaluate  $\int \frac{\cos x - \sin x}{\cos x + \sin x} (2 + 2 \sin 2x) dx$

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131. Evaluate:  $\int \frac{e^{3x} + e^{5x}}{e^x + e^{-x}} dx$

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132. Evaluate:  $\int \frac{\cos 2x - \cos 2\theta}{\cos x - \cos \theta} dx$

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133. Evaluate  $\int \frac{(1 + \ln x)^5}{x} dx$

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134. Evaluate:  $\int \sin x \cos x \cos 2x \cos 4x \cos 8x dx$

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135. Evaluate  $\int \frac{1}{\sqrt{1 - e^{2x}}} dx$



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136. Evaluate  $\int \frac{2x + 3}{\sqrt{x^2 + 4x + 9}} dx$



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137. Evaluate:  $\int \frac{dx}{\sqrt{x} + \sqrt{x - 2}}$



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138. Evaluate  $\int \frac{x^3}{x + 1} dx$



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139. Evaluate:  $\int x \sin 3x dx$ .



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140. Evaluate:  $\int x \log x dx$ .



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141. Evaluate:  $\int \sin^{-1} x dx$ .



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



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143. Evaluate:  $\int \sqrt{x^2 + 2x + 5} dx$

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144. Evaluate:  $\int \sqrt{1 + 3x - x^2} dx$

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145. Evaluate  $\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx$

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146. Evaluate:  $\int \frac{\cot x}{\sqrt{\sin x}} dx$

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147. Evaluate  $\int \left( \frac{x+1}{x} \right) (x + \log x)^2 dx$

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148. Evaluate  $\int \tan^4 x dx$ .

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149. Evaluate:  $\int (\tan x - x) \tan^2 x dx$

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150. Evaluate  $\int \frac{\log\left(\tan \frac{x}{2}\right)}{\sin x} dx$ .



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151. Evaluate:  $\int \frac{\sqrt{2 + \log x}}{x} dx$



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152. Evaluate  $\int \frac{\log x}{(1 + \log x)^2} dx.$



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153.  $\int [\sin(\log x) + \cos(\log x)] dx$



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

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155. Evaluate  $\int f(x)$  is polynomaial function of then the degree, prove that

$$\int e^x f(x) dx = e^x [f(x)f'(x) + f^x = f^x + \dots + (-1)^n f^n(x)]$$

where  $f^n(x) dx + \frac{d^n f}{dx^n}$

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156. Evaluate:  $\int e^x (f(x) + f'(x)) dx = e^x f(x) + C$

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157. Evaluate  $\int \frac{dx}{x^2(x^4 + 1)^{\frac{3}{4}}}$ .

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158. Evaluate:  $\int \frac{dx}{\sqrt{2ax - x^2}}$

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159. Evaluate:  $\int \sin^{-1} \sqrt{\frac{x}{a+x}} dx$ .

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160. Evaluate  $\int \frac{x^{5/2}}{\sqrt{1+x^7}} dx$

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161. Evaluate:  $\int \frac{\sec^2 x}{3 + \tan x} dx$

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162. Evaluate:  $\int \frac{1 - \tan x}{1 + \tan x} dx$

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163.  $\frac{e^x - e^{-x}}{e^x + e^{-x}}$

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164. Evaluate:  $\int \frac{1}{\sqrt{3x+4} - \sqrt{3x+1}} dx$ .

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165. Evaluate:  $\int \frac{\sin 2x}{a^2 \sin^2 x + b^2 \cos^2 x} dx.$

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166. Evaluate:  $\int \frac{1}{1 + e^{-x}} dx.$

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167. Evaluate  $\int e^x (1 + \tan x + \tan^2 x) dx$

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168.

Evaluate:

if  $\int g(x) dx = g(x)$ , then  $\int g(x) \{f(x) + f'(x)\} dx$



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169. Evaluate  $\int \cos \sqrt{x} dx$



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170. Evaluate:  $\int x \sin^2 x dx$



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171. Evaluate: if  $\int f(x) dx = g(x)$ , then  $\int f^{-1}(x) dx$



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172. Evaluate  $\int \frac{x \sin^{-1} x}{\sqrt{1-x^2}} dx$

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173. Evaluate:  $\int \tan^{-1} \sqrt{x} dx$

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174.  $\int \sin^3 x dx =$

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175. Evaluate:  $\int \sin^3 x \cos^2 x dx$

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176. Evaluate  $\int a^{mx} b^{nx} dx$

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177. Evaluate the following integrals :  $\int \frac{\tan x}{\sec x + \tan x} dx$

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178.

Evaluate

if  $\int \frac{1}{x + x^5} dx = f(x) + c$ , then  $\int \frac{x^4}{x + x^5} dx$ .

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179. If  $\int \frac{(x^3 + 8)(x - 1)}{x^2 - 2x + 4} dx$



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180. Integrate the functions  $\frac{\sin^3 x + \cos^3 x}{\sin^2 x \cos^2 x}$



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



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



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183.

Evaluate

$$\int \left( \frac{8x + 13}{\sqrt{4x + 7}} \right) dx \quad (\text{A})$$

$$\frac{1}{3}(4x + 7)^{\frac{3}{2}} - \frac{1}{2}(4x + 7)^{\frac{1}{2}} + c \quad (\text{B})$$

$$\frac{1}{6}(4x + 7)^{\frac{5}{2}} - \frac{2}{3}(4x + 7)^{\frac{3}{2}} + c \quad (\text{C})$$

$$\frac{1}{3}(4x + 7)^{\frac{5}{2}} - \frac{1}{2}(4x + 7)^{\frac{3}{2}} + c \quad (\text{D})$$

$$(4x + 7)^{\frac{3}{2}} - \frac{1}{2}(4x + 7)^{\frac{1}{2}} + c$$

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$$184. \int \frac{\sec x}{\sqrt{\cos 2x}} dx =$$

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$$185. \text{ Evaluate: } \int \sin^3 x \cos^2 x dx$$

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186. Evaluate:  $\int \frac{x dx}{\sqrt{(1+x^2)} + \sqrt{(1+x^2)^3}}$

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187. Evaluate:  $\int \frac{2x + 1}{x^4 + 2x^3 + x^2 - 1} dx$

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188. Evaluate:  $\int \frac{1}{x^2 - x + 1} dx$

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189. Evaluate:  $\int \frac{1}{2x^2 + x - 1} dx$



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190. Evaluate:  $\int \frac{\cos x}{\sin\left(x - \frac{\pi}{6}\right)\sin\left(x + \frac{\pi}{6}\right)} dx$

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191. Evaluate:  $\int \frac{1}{1 + \sin x + \cos x} dx$

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192. Evaluate:  $\int \frac{2x - 1}{(x - 1)(x + 2)(x - 3)} dx$

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193. Evaluate:  $\int \tan^{-1} \sqrt{\frac{1-x}{1+x}} dx$

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194. Evaluate:  $\int \frac{1}{\sin x - \sin 2x} dx$

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195. Evaluate  $\int \frac{2x}{(x^2 + 1)(x^2 + 2)} dx.$

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196. Evaluate:  $\int \frac{(x-1)(x-2)(x-3)}{(x-4)(x-5)(x-6)} dx$

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197. Evaluate:  $\int \frac{1 - \cos x}{\cos x(1 + \cos x)} dx$

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198. Evaluate  $\int (1 - \cos x) \operatorname{cosec}^2 x dx$

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199. Evaluate  $\int (\sec x + \tan x)^2 dx$

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200. Evaluate  $\int \frac{\sec x}{\sec x + \tan x} dx.$

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201. Evaluate  $\int \tan^{-1} \left\{ \sqrt{\left( \frac{1 - \cos 2x}{1 + \cos 2x} \right)} \right\} dx, 0 < x < \pi/2.$

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202.  $\int \frac{1}{1 + \sin x} dx :$

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

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204. Evaluate  $\int \sec^2 x \operatorname{cosec}^2 x dx.$



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205. Evaluate  $\int \frac{2^{x+1} - 5^{x-1}}{10^x} dx.$



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206. Evaluate:  $\int \frac{(1+x)^3}{\sqrt{x}} dx.$



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207. Evaluate:  $\int \frac{x^2 + 4}{x^4 + 16} dx$



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

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209. Evaluate:  $\int \frac{dx}{9 + 16 \sin^2 x}$

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210. Find  $\int \frac{dx}{\sqrt{x} + x}$

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211. Evaluate:  $\int \frac{\cot x}{\sqrt{\sin x}} dx$

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212. Evaluate  $\int \frac{\sqrt{x} dx}{1+x}$

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213. Evaluate  $\int \frac{x^2 \tan^{-1} x^3}{1+x^6} dx$

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214. Evaluate:  $\int \sin^3 x \cos^2 x dx$

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215. Evaluate:  $\int \frac{1}{x^4 - 1} dx$

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216. If the product of  $n$  positive numbers is  $n^n$ . Then their sum is

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217. Evaluate:  $\int \frac{dx}{\sin x(3 + \cos^2 x)}$

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218. Evaluate:  $\int \frac{x^2 + 1}{x(x^2 - 1)} dx$

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219. Evaluate:  $\int \frac{\sin x}{\sin 4x} dx$



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220. Evaluate:  $\int \frac{\log_{e^x} e \cdot \log_{e^2 x} e \cdot \log_{e^3 x} e}{x} dx$



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221. Evaluate  $\int e^{3 \log x} (x^4 + 1)^{-1} dx$



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222. Evaluate  $\int \frac{dx}{x^{2/3}(1+x^{2/3})}$



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