MATHS

BOOKS - NIKITA MATHS (HINGLISH)

DEFINITE INTEGRAL

Multiple Choice Questions

1. $\int_2^3 x^2 dx$

A. $\frac{211}{5}$

B. $\frac{-211}{5}$

C. 55

D. -55

Answer: A

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2. Which of the following is true ?

A. $\int_0^1 \sqrt{x} \quad dx = \frac{2}{3}$

B. $\int_0^1 \sqrt{x} \quad dx = \frac{-2}{3}$

C. $\int_0^1 \sqrt{x} \quad dx = \frac{3}{2}$

D. $\int_0^1 \sqrt{x} \quad dx = \frac{-3}{2}$

Answer: A

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3. $\int_4^9 \frac{dx}{\sqrt{x}} =$

A. 1

B. -2

C. 2

D. -1

Answer: C

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4. $\int_0^1 \frac{x^2+3x+2}{\sqrt{x}} dx =$

A. $\frac{8}{5}$

B. $\frac{16}{5}$

C. $\frac{32}{5}$

D. $\frac{64}{5}$

Answer: C

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5. $\int_0^1 \frac{dx}{\sqrt{1+x}\sqrt{x}} =$

A. $\frac{2}{3}(\sqrt{2}-1)$

B. $\frac{2}{3}(\sqrt{2}+1)$

C. $\frac{4}{3}(\sqrt{2}-1)$

D. $\frac{4}{3}(\sqrt{2}+1)$

Answer: C

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6. $\int_3^5 \frac{dx}{\sqrt{x+4}+\sqrt{x-2}} =$

A. $\frac{1}{9}(28-3\sqrt{3}-7\sqrt{7})$

B. $\frac{1}{9}(28-3\sqrt{3}+7\sqrt{7})$

C. $\frac{1}{9}(28+3\sqrt{3}-7\sqrt{7})$

D. $\frac{1}{9}(28+3\sqrt{3}+7\sqrt{7})$

Answer: A

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7. if $f(x) = a + bx + cx^2$, then what is $\int_0^1 f(x)dx$ equal to ?

A. $f(0) + 4f\left(\frac{1}{2}\right) + f(1)$

B. $\frac{1}{6}\left(f(0) + 4f\left(\frac{1}{2}\right) + f(1)\right)$

C. $\frac{1}{3}\left(f(0) + 4f\left(\frac{1}{2}\right) + f(1)\right)$

D. $\frac{1}{2}\left(f(0) + 4f\left(\frac{1}{2}\right) + f(1)\right)$

Answer: B

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8. If $\int_0^a (2x + 1)dx = 2, \quad \text{then} \quad a =$

A. 1, 2

B. $-1, 2$

C. $1, \ -2$

D. $-1, \ -2$

Answer: C

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9. If $\int_0^a 3x^2 dx = 8,$ find the value of a.

A. 0

B. -2

C. 2

D. ± 2

Answer: C

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10. If $\int_0^1 (3x^2 + 2x + \alpha)dx = 0, \quad \text{then} \quad \alpha =$

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

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

C. 2

D. -2

Answer: D

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11. If $\int_1^a (3x^2 + 2x + 1)dx = 11$ then the value of a is

A. -4

B. 4

C. -2

D. 2

Answer: D

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12. If $\int_0^a 4x^3 dx = 16,$ and $a > 0,$ then $a =$

A. 0

B. -2

C. 2

D. ± 2

Answer: C

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13. If $\int_a^b x^3 dx = 0, and If \int_a^b x^2 dx = \frac{2}{3}, find real values of a$ find $a and b$.

A. a = 1, b = -1

B. $a = 0, b = 1$

C. $a = -1, b = 1$

D. $a = -1, b = 0$

Answer: C

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14. The value of $\int_{-3}^{3} (ax + bx^3 + cx + k)dx$, where a,b,c,k are constants, depends only on. . . .

A. a and k

B. a and b

C. a, b and c

D. k

Answer: D

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15. $\int_{-2}^{3} \frac{dx}{x+5} =$

A. $\log\left(\frac{2}{3}\right)$

B. $\log\left(\frac{4}{3}\right)$

C. $\log\left(\frac{8}{3}\right)$

D. $\frac{\log 16}{3}\Big)$

Answer: C

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16. $\int_1^2 \frac{dx}{2x+5} =$

A. $\frac{1}{2}\log\left(\frac{5}{7}\right)$

B. $\frac{1}{2}\log\left(\frac{7}{5}\right)$

C. $2\log\left(\frac{5}{7}\right)$

D. $2\log\left(\frac{7}{5}\right)$

Answer: B

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17. $\int_4^2 \frac{x^2+x}{\sqrt{2x+1}}dx =$

A. $\frac{228}{5} - \sqrt{5}$

B. $\frac{228}{5} + \sqrt{5}$

C. $\frac{57}{5} - \sqrt{5}$

D. $\frac{57}{5}\sqrt{5}$

Answer: C

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18. $\int_0^{\pi/4} \frac{dx}{1+x^2}$

A. 0

B. 1

C. $\tan^{-1}\left(\frac{\pi}{4}\right)$

D. $-\tan^{-1}\left(\frac{\pi}{4}\right)$

Answer: C

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19. if $\int_0^k \frac{dx}{2+8x^2} = \frac{\pi}{16}$ then find the value of k

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

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

C. $\frac{\pi}{2}$

D. $\frac{-\pi}{2}$

Answer: A

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20. Evaluate the following definite integral:

$$\int_0^1 \frac{1}{2x^2+x+1}dx$$

A. $\frac{1}{\sqrt{7}}\tan^{-1}\left(\frac{\sqrt{7}}{6}\right)$

B. $\frac{1}{\sqrt{7}}\tan^{-1}\left(\frac{\sqrt{7}}{3}\right)$

C. $\frac{2}{\sqrt{7}}\tan^{-1}\left(\frac{\sqrt{7}}{6}\right)$

D. $\frac{2}{\sqrt{7}}\tan^{-1}\left(\frac{\sqrt{7}}{3}\right)$

Answer: D

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21. Evaluate the following :

$$\int_{-2}^{1} \frac{dx}{x^2 + 4x + 13}$$

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

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

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

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

Answer: D

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22. $\int_{0}^{2} \frac{dx}{4 + x - x^2} =$

A. $\frac{1}{2\sqrt{17}}\log\left(\frac{5+\sqrt{17}}{5-\sqrt{17}}\right)$

B. $\frac{1}{2\sqrt{17}}\log\left(\frac{5-\sqrt{17}}{5+\sqrt{17}}\right)$

C. $\frac{1}{\sqrt{17}}\log\left(\frac{5+\sqrt{17}}{5-\sqrt{17}}\right)$

D. $\frac{1}{\sqrt{17}}\log\left(\frac{5-\sqrt{17}}{5+\sqrt{17}}\right)$

Answer: C

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23. $\int_0^a \frac{dx}{(ax+a^2-x^2)}$

A. $\frac{-1}{a\sqrt{5}}\log\left(\frac{7+3\sqrt{5}}{2}\right)$

B. $\frac{1}{a\sqrt{5}}\log\left(\frac{7+3\sqrt{5}}{2}\right)$

C. $\frac{-2}{a\sqrt{5}}\log\left(\frac{7+3\sqrt{5}}{2}\right)$

D. $\frac{2}{a\sqrt{5}}\log\left(\frac{7+3\sqrt{5}}{2}\right)$

Answer: B

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24. $\int_2^3 \frac{x}{x^2-1}dx =$

A. $\frac{1}{2}\log\left(\frac{3}{8}\right)$

B. $\frac{1}{2}\log\left(\frac{8}{3}\right)$

C. $\frac{1}{2}\log\left(\frac{3}{4}\right)$

D. $\frac{1}{2}\log\left(\frac{4}{3}\right)$

Answer: B

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25. Evaluate the following :

$$\int_1^2 \frac{dx}{x^2+6x+5}$$

A. $\frac{1}{4}\log\left(\frac{9}{7}\right)$

B. $\frac{1}{4}\log\left(\frac{7}{9}\right)$

C. $\frac{1}{2}\log\left(\frac{3}{7}\right)$

D. $\frac{1}{2}\log\left(\frac{7}{3}\right)$

Answer: A

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26. $\int_0^2 \frac{dx}{\sqrt{4-x^2}} = ?$

A. $\frac{\pi}{2}$

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

C. π

D. 0

Answer: A

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27. $\int_0^2 \frac{dx}{\sqrt{4-x^2}} = ?$

A. $\frac{\pi}{2}$

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

C. π

D. 3π

Answer: C

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28. $\int_0^a \frac{dx}{\sqrt{ax - x^2}}$

A. $\frac{\pi}{2}$

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

C. π

D. 0

Answer: C

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29. Evaluate the following :

$$\int_0^1 \frac{1}{\sqrt{3+2x-x^2}}dx$$

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

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

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

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

Answer: C

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30. Evaluate : $(i)\int_0^4 \frac{dx}{\sqrt{x^2+2x+3}}$ $(ii)\frac{dx}{(1+x+x^2)}$

A. $\log\left(\frac{1+\sqrt{3}}{5+3\sqrt{3}}\right)$

B. $\log\left(\frac{5+3\sqrt{3}}{1+\sqrt{3}}\right)$

C. $\log\left(\frac{1+\sqrt{3}}{5+\sqrt{3}}\right)$

D. $\log\left(\frac{5+\sqrt{3}}{1+\sqrt{3}}\right)$

Answer: B

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31. Evaluate: $\int_0^2 \frac{5x+1}{x^2+4}dx$

A. $\frac{5}{2}\log 2 - \frac{\pi}{4}$

B. $\frac{5}{2}\log 2 + \frac{\pi}{4}$

C. $\frac{5}{2}\log 2 - \frac{\pi}{8}$

D. $\frac{5}{2}\log 2 + \frac{\pi}{8}$

Answer: D

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32. $\int_0^1 \frac{x^2}{x^2+1} dx =$

A. $2 - \frac{\pi}{4}$

B. $2 + \frac{\pi}{4}$

C. $1 - \frac{\pi}{4}$

D. $1+\frac{\pi}{4}$

Answer: C

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33. Evaluate the following :

$$\int_0^1 \frac{x^2-2}{x^2+1}dx$$

A. $1+\frac{\pi}{4}$

B. $1-\frac{\pi}{4}$

C. $1+\frac{3\pi}{4}$

D. $1-\frac{3\pi}{4}$

Answer: D

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34. Evaluate the following :

$$\int_0^1 \frac{1-x^2}{1+x^2}dx$$

A. $\frac{\pi}{2}-1$

B. $\frac{\pi}{2}+1$

C. $\frac{\pi}{4}-1$

D. $\frac{\pi}{4}+1$

Answer: A

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35. Evaluate the following :

$$\int_1^2 \frac{x^2}{x^2+4x+3}dx$$

A. $1-2\log\left(\frac{8}{10}\right)+\frac{5}{2}\log\left(\frac{6}{5}\right)$

B. $1+2\log\left(\frac{8}{10}\right)-\frac{5}{2}\log\left(\frac{6}{5}\right)$

C. $1+2\log\left(\frac{8}{10}\right)+\frac{5}{2}\log\left(\frac{6}{5}\right)$

D. $1-2\log\left(\frac{8}{10}\right)-\frac{5}{2}\log\left(\frac{6}{5}\right)$

Answer: C

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36. If $I_1\int_1^2 \frac{dx}{\sqrt{1+x^2}}$ and $I_1=\int_1^2 \frac{dx}{x}$ then

A. $I_1 > I_2$

B. $I_1 < I_2$

C. $I_1 = I_2$

D. $I_1 > 2I_2$

Answer: B

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37. If $g(1) = g(2)$, then $\int_1^2 [f\{g(x)\}]^{-1} f'\{g(x)\}g'(x)dx$ is equal to

A. 1

B. 2

C. 0

D. -1

Answer: C

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38. $\int_0^1 \frac{dx}{[ax+(1-x)b]^2} =$

A. $\frac{a}{b}$

B. $\frac{b}{a}$

C. ab

D. $\frac{1}{ab}$

Answer: D

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39. $\int_0^9 \frac{dx}{1+\sqrt{x}}$

A. $6-4\log 2$

B. $3-4\log 2$

C. $6-2\log 2$

D. $3-2lo2$

Answer: A

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40. $\int_0^1 \sqrt{\frac{1-x}{1+x}}dx$

A. $\frac{\pi}{2}+1$

B. $\frac{\pi}{2}-1$

C. $\frac{\pi}{2}+2$

D. $\frac{\pi}{2}-2$

Answer: B

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41. $\int_0^{1/2} \frac{dx}{(1-2x^2)\sqrt{1-x^2}} =$

A. $\frac{-1}{2}\log\left(2+\sqrt{3}\right)$

B. $\frac{1}{2}\log\left(2+\sqrt{3}\right)$

C. $\frac{-1}{4}\log\left(2+\sqrt{3}\right)$

D. $\frac{1}{4}\log\left(2+\sqrt{3}\right)$

Answer: B

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

A. $\frac{\pi}{4}+\frac{1}{2}$

B. $\frac{\pi}{4}-\frac{1}{2}$

C. $\frac{\pi}{2}+\frac{1}{2}$

D. $\frac{\pi}{2}-\frac{1}{2}$

Answer: B

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43. If $\int_0^a \sqrt{x}dx = 2a\int_0^{\pi/2} \sin^3 x dx$ find the value of integral $\int_a^{a+1} xdx$.

A. $\frac{-1}{2}, \frac{-9}{2}$

B. $\frac{1}{2}, \frac{9}{2}$

C. $\frac{-1}{2}, \frac{9}{2}$

D. $\frac{1}{2}, \frac{-9}{2}$

Answer: B

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44. $\int_0^{\pi/2} \frac{(\sin x + \cos x)^2}{\sqrt{1+\sin 2x}} dx =$

A. 0

B. 1

C. 2

D. 3

Answer: C

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45. The correct evalution of $\int_0^{\pi/2} \sin x \sin 2x dx$ is

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

B. $\frac{1}{3}$

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

D. $\frac{2}{3}$

Answer: D

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46. Evaluate the following :

$$\int_0^{\pi/4} \sin 3x \sin 2x dx$$

A. $\frac{3\sqrt{2}}{5}$

B. $\frac{2\sqrt{2}}{5}$

C. $\frac{3}{10\sqrt{2}}$

D. $\frac{3}{5\sqrt{2}}$

Answer: D

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47. $\int_0^{\pi/2} \cos^2 x \quad dx =$

A. $\frac{3\pi}{4}$

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

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

D. $\frac{\pi}{2}$

Answer: B

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48. $If I = \int_0^{\pi/4} \sin^2 x \quad dx \text{ and } J = \int_0^{\pi/4} \cos^2 x \quad dx.$

then

A. $I = J$

B. $I < J$

C. $I > J$

D. $I + J = \frac{\pi}{4}$

Answer: D

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49. Evaluate : $\int_0^{\pi/2} \left(a^2 \cos^2 x + b^2 \sin^2 x\right) dx$

A. $\frac{\pi}{2}(a-b)$

B. $\frac{\pi}{2}(a+b)$

C. $\frac{\pi}{4}(a-b)$

D. $\frac{\pi}{4}(a+b)$

Answer: D

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50. Evaluate : $\int_{\frac{\pi}{3}}^{\frac{\pi}{4}} (\tan x + \cot x)^2 dx$

A. $\frac{-2}{\sqrt{3}}$

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

C. $\frac{-1}{\sqrt{3}}$

D. $\frac{1}{\sqrt{3}}$

Answer: A

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51. $\int_0^{2\pi} \left|\sin^3\theta\right| d\theta$

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

B. $\frac{5}{3}$

C. $\frac{2}{3}$

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

Answer: D

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52. Evaluate : $(i)\int_0^{\pi/2}\cos^3 x dx$ $(ii)\int_0^{\pi/2}\sin^4 x dx$

A. $\frac{2}{3}$

B. $\frac{5}{6}$

C. $\frac{-2}{3}$

D. $\frac{-5}{6}$

Answer: A

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53. $\int_0^{\pi/2}\sin^4 x \quad dx =$

A. $\frac{3\pi}{8}$

B. $\frac{3\pi}{16}$

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

D. $\frac{3\pi}{32}$

Answer: B

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54. $\int_0^{\pi/2} \cos^5 x \quad dx =$

A. $\frac{8\pi}{15}$

B. $\frac{5\pi}{32}$

C. $\frac{8}{15}$

D. $\frac{5}{32}$

Answer: C

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55. $\int_0^{\pi/4} \tan^2 x \quad dx =$

A. $1 - \frac{\pi}{4}$

B. $1 - \frac{\pi}{2}$

C. $2 - \frac{\pi}{4}$

D. $2 - \frac{\pi}{2}$

Answer: A

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56. Evaluate: $\int_0^{\pi/4} \sqrt{1+\sin 2x}dx$ (ii) $\int_0^{\pi/4} \sqrt{1-\sin 2x}dx$

A. 1

B. 2

C. 3

D. 4

Answer: A

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57. Evaluate: $\int_{\pi/4}^{\pi/2} \sqrt{1-\sin 2x}dx$

A. $1-2\sqrt{2}$

B. $1+2\sqrt{2}$

C. $1-\sqrt{2}$

D. $1+\sqrt{2}$

Answer: C

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58. $\int_0^{\pi/2} \sqrt{1-\cos x}\ \ dx =$

A. $\sqrt{\hat{}}(2)-2$

B. $\sqrt{2}+2$

C. $2\sqrt{2}-2$

D. $2\sqrt{2}+2$

Answer: C

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59. $\int_0^{\pi/2} \frac{\sin x + \cos x}{\sqrt{1+\sin 2x}}\, dx =$

A. 0

B. π

C. 2π

D. $\frac{\pi}{2}$

Answer: D

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60. $\int_0^{\pi} \frac{dx}{1-\sin x} =$

A. 0

B. 1

C. 2

D. -2

Answer: D

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61. $\int_{-\pi/4}^{\pi/4} \frac{dx}{1+\sin x} =$

A. $2-\sqrt{2}$

B. $2+\sqrt{2}$

C. $\sqrt{2}$

D. 2

Answer: D

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62. $\int_{-\pi/4}^{\pi/4} \frac{dx}{1-\sin x} =$

A. 2

B. -2

C. $\sqrt{2}$

D. $-\sqrt{2}$

Answer: A

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63. $\int_0^{\pi/2} \frac{dx}{1+\cos x}$

A. 1

B. π

C. 2

D. 2π

Answer: A

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64. The greater of $\int_0^{\pi/2} \frac{\sin x}{x} dx$ and $\frac{\pi}{2}$ is

A. $\frac{\pi}{2}$

B. $\int_0^{\pi/2} \frac{\sin x}{x} dx$

C. nothing can be said

D. both are equal

Answer: A

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65. Evaluate : $(i)\int_0^{\pi/2}\frac{\cos x}{\left(\cos.\frac{x}{2}+\sin.\frac{x}{2}\right)}dx$

$(ii)\int_0^{\pi/2}\frac{\cos x}{(1+\cos x+\sin x)}dx$

A. $\frac{\pi}{2}+\log\sqrt{2}$

B. $\frac{\pi}{2}-\log\sqrt{2}$

C. $\frac{\pi}{4}+\log\sqrt{2}$

D. $\frac{\pi}{4}-\log\sqrt{2}$

Answer: D

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66. $\int_{\pi/4}^{\pi/2}\frac{\cos\theta}{\left(\cos\left(\frac{\theta}{2}\right)+\sin\left(\frac{\theta}{2}\right)\right)^3}d\theta=$

A. $\frac{2}{\cos\left(\frac{\pi}{8}\right)+\sin\left(\frac{\pi}{8}\right)}+\sqrt{2}$

B. $\frac{-2}{\cos\left(\frac{\pi}{8}\right)+\sin\left(\frac{\pi}{8}\right)}+\sqrt{2}$

C. $\frac{2}{\cos\left(\frac{\pi}{8}\right)+\sin\left(\frac{\pi}{8}\right)}-\sqrt{2}$

D. $\frac{-2}{\cos\left(\frac{\pi}{8}\right)+\sin\left(\frac{\pi}{8}\right)}-\sqrt{2}$

Answer: C

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67. $\int_0^{\pi/2}\frac{\sin^2\theta}{(1+\cos\theta)^2}d\theta=$

A. $\frac{\pi}{2}+2$

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

C. $2 - \frac{\pi}{2}$

D. $-2 - \frac{\pi}{2}$

Answer: C

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68. $\int_0^{\pi/4} \frac{\tan^3 x}{(1+\cos 2x)} dx$

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

B. $\frac{1}{4}$

C. $\frac{1}{8}$

D. $\frac{1}{16}$

Answer: C

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69. $\int_0^{\pi/2} \frac{\cos x}{3\cos x + \sin x} dx =$

A. $\frac{3\pi}{10} - \frac{1}{10}\log 3$

B. $\frac{3\pi}{10} + \frac{1}{10}\log 3$

C. $\frac{3\pi}{20} - \frac{1}{10}\log 3$

D. $\frac{3\pi}{20} + \frac{1}{10}\log 3$

Answer: C

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70. $\int_0^{\pi/2} \left(\sqrt{\tan x} + \sqrt{\cot x}\right) dx$

A. $\sqrt{2}\pi$

B. 2π

C. $\frac{\pi}{\sqrt{2}}$

D. $\frac{\pi}{2}$

Answer: A

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71. $\int_1^3 \frac{\cos(\log x)}{x} dx$

A. $\cos(\log 3)$

B. $\sin(\log 3)$

C. 1

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

Answer: B

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72. $\int_0^{\pi/2} \sin^3 x \cos^3 x \quad dx =$

A. $\frac{1}{12}$

B. $\frac{1}{24}$

C. $\frac{1}{3}$

D. $\frac{1}{6}$

Answer: A

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73. $\int_0^{\pi/2} \sin^2 x \cos^3 x \quad dx =$

A. $\frac{2}{15}$

B. $\frac{1}{15}$

C. 0

D. ∞

Answer: A

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74. $\int_0^{\frac{\pi}{2}} \sqrt{\sin\phi} \cos^5 \phi d\phi$

A. $\frac{32}{321}$

B. $\frac{64}{321}$

C. $\frac{8}{321}$

D. $\frac{16}{321}$

Answer: B

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75. $\int_0^{\pi/2} \sqrt{\cos x} \sin^3 x \quad dx =$

A. $\frac{4}{21}$

B. $\frac{10}{21}$

C. $\frac{8}{21}$

D. $\frac{20}{21}$

Answer: C

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76. $\int_0^{\pi} \sin^3 x(1+2\cos x)(1+\cos x)^2 dx$

A. $\frac{8}{3}$

B. $\frac{-8}{3}$

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

D. $\frac{-4}{3}$

Answer: A

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77. $\int_0^{\pi/4} \sec^4 x dx =$

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

B. $\frac{2-\sqrt{2}}{3}$

C. $\frac{2+2\sqrt{2}}{3}$

D. $\frac{2-2\sqrt{2}}{3}$

Answer: B

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78. $\int_0^{\pi/4} \sec^4 x \quad dx =$

A. $\frac{2}{3}$

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

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

D. $\frac{-4}{3}$

Answer: C

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79. $\int_0^{\pi/2} \frac{\cos x}{1+\sin^2 x} dx =$

A. $\frac{-\pi}{2}$

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

C. $\frac{-\pi}{4}$

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

Answer: D

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80. $\int_0^{\pi/2} \frac{\sin x}{1+\cos^2 x} dx =$

A. $\frac{-\pi}{2}$

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

C. $\frac{-\pi}{4}$

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

Answer: D

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81. $\int_0^{\pi/2} \frac{\sin x \cos x}{1+\sin^4 x} dx =$

A. $\frac{\pi}{8}$

B. $\frac{-\pi}{8}$

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

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

Answer: A

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82. Evaluate the following :

$\int_0^{\pi/4} \frac{\sec^2 x}{\tan^2 x + 4\tan x + 1} dx$

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83. $\int_0^{\pi} \frac{dx}{1-2a\cos x+a^2} =$

A. $\frac{\pi}{2-2a^2}$

B. $\frac{\pi}{1-a^2}$

C. $2\pi\left(1-a^2\right)$

D. $\pi\left(1-a^2\right)$

Answer: B

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84. $\int_0^{\pi/4} \frac{\sin 2x}{\sin^4 x+\cos^4 x}dx =$

A. $\frac{\pi}{2}$

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

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

D. $\frac{3\pi}{4}$

Answer: B

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85. $\int_0^{\pi/2} \frac{1+2\cos x}{(2+\cos x)^2} dx =$

A. π

B. 2

C. $\frac{\pi}{2}$

D. $\frac{1}{2}$

Answer: D

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86. $\int_{\pi/4}^{3\pi/4} \frac{dx}{(\sin x - 2\cos x)(2\sin x + \cos x)} =$

A. $\frac{1}{5}\log 3$

B. $\frac{1}{5}\log 9$

C. $5\log 3$

D. $5\log 9$

Answer: B

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87. If $I_n = \int_0^{\pi/4} \tan^n \theta \quad d\theta$, then $I_8 + I_6 =$

A. $\frac{1}{4}$

B. $\frac{1}{5}$

C. $\frac{1}{6}$

D. $\frac{1}{7}$

Answer: D

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88. $\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{9 + 16 \sin 2x} dx$

A. $\frac{1}{10}\log 3$

B. $\frac{1}{20}\log 3$

C. $\frac{1}{10}\log 5$

D. $\frac{1}{20}\log 5$

Answer: B

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89. Evaluate the following :

$$\int_0^{\pi/2} \frac{1}{5+4\cos x}\,dx$$

A. $\frac{1}{3}\tan^{-1} 3$

B. $\frac{2}{3}\tan^{-1} 3$

C. $\frac{1}{3}\tan^{-1}\left(\frac{1}{3}\right)$

D. $\frac{2}{3}\tan^{-1}\left(\frac{1}{3}\right)$

Answer: D

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90. $\int_0^{\pi/2} \frac{dx}{5+4\sin x} =$

A. $\frac{1}{3}\tan^{-1} 3$

B. $\frac{2}{3}\tan^{-1} 3$

C. $\frac{1}{3}\tan^{-1}\left(\frac{1}{3}\right)$

D. $\frac{2}{3}\tan^{-1}\left(\frac{1}{3}\right)$

Answer: D

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91. $\int_0^{\pi/2} \frac{dx}{4\cos x + 9\sin x} =$

A. $\frac{1}{\sqrt{97}} \log\left(\frac{13-\sqrt{97}}{13+\sqrt{97}}\right)$

B. $\frac{1}{\sqrt{97}} \log\left(\frac{13+\sqrt{97}}{13-\sqrt{97}}\right)$

C. $\frac{1}{2\sqrt{97}} \log\left(\frac{13-\sqrt{97}}{13+\sqrt{97}}\right)$

D. $\frac{1}{2\sqrt{97}} \log\left(\frac{13+\sqrt{97}}{13-\sqrt{97}}\right)$

Answer: B

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92. $\int_0^{\pi} \frac{dx}{3+2\sin x+\cos x} =$

A. $\frac{-\pi}{2}$

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

C. $\frac{-\pi}{4}$

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

Answer: D

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

A. πab

B. $2\pi ab$

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

D. $\frac{\pi^2}{2ab}$

Answer: D

Watch Video Solution

94. $\int_{\pi/6}^{\pi/2} \frac{\text{cosec}\ \ x \cot x}{1+\text{cosec}^2 x}$

A. $-\tan^{-1}\left(\frac{1}{3}\right)$

B. $\tan^{-1}\left(\frac{1}{3}\right)$

C. $-\tan^{-1} 3$

D. $\tan^{-1} 3$

Answer: B

Watch Video Solution

95. If $f(x) = \tan x - \tan^3 x + \tan^5 x - \tan^7 x + ...\infty$

for

$o < x < \frac{\pi}{4}$, than $\int_0^{\pi/4} f(x)dx =$

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

B. $\frac{1}{4}$

C. 0

D. 1

Answer: B

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96. $\int_0^1 \frac{\sqrt{\tan^{-1} x}}{1+x^2} dx =$

A. $\frac{\pi\sqrt{\pi}}{4}$

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

C. $\frac{\pi\sqrt{\pi}}{12}$

D. $\frac{\pi\sqrt{\pi}}{6}$

Answer: C

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97. $\int_1^2 \frac{dx}{x(1+\log x)^2}$

A. $\frac{2(1+\log 2)}{\log 2}$

B. $\frac{2\log 2}{1+\log 2}$

C. $\frac{1+\log 2}{\log 2}$

D. $\frac{\log 2}{1+\log 2}$

Answer: D

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98. The value of the integral $\int_0^{\log 5} \frac{e^x\sqrt{e^x-1}}{e^x+3}dx$

A. $4-\pi$

B. $4+\pi$

C. $2-\pi$

D. $2+\pi$

Answer: A

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99. If $I_1 = \int_e^{e^2} \frac{dx}{\ln x}$ and $I_2 = \int_1^2 \frac{e^x}{x} dx$

A. $I_1 + I_2$

B. $I_1 > I_2$

C. $I_1 < I_2$

D. $I_1 = I_2$

Answer: D

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100. $\int_0^{\pi/2} x \sin x dx =$

A. 0

B. -1

C. ± 1

D. 1

Answer: D

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101. $\int_0^{\pi/2} x \cos x \quad dx =$

A. $\frac{\pi}{2} - 2$

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

C. $\frac{\pi}{2} - 1$

D. $\frac{\pi}{2} + 1$

Answer: C

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102. $\int_0^{\pi/4} x \sec^2 x \quad dx =$

A. $\frac{\pi}{4} - \log 2$

B. $\frac{\pi}{2} - iog2$

C. $\frac{\pi}{4} - \log \sqrt{2}$

D. $\frac{\pi}{2} - \log\sqrt{2}$

Answer: C

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103. $\int_0^{\pi/4} x^2 \sin x \quad dx =$

A. $\sqrt{2} + 2 + \frac{\pi}{2\sqrt{2}} + \frac{\pi^2}{16\sqrt{2}}$

B. $\sqrt{2} + 2 - \frac{\pi}{2\sqrt{2}} + \frac{\pi^2}{16\sqrt{2}}$

C. $\sqrt{2} - 2 + \frac{\pi}{2\sqrt{2}} + \frac{\pi^2}{16\sqrt{2}}$

D. $\sqrt{2} - 2 + \frac{\pi}{2\sqrt{2}} - \frac{\pi^2}{16\sqrt{2}}$

Answer: D

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104. $\int_0^{\pi/2} x^2 \sin x \quad dx =$

A. $\pi + 2$

B. $\pi - 2$

C. $\frac{\pi}{2} + 1$

D. $\frac{\pi}{2} - 1$

Answer: B

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105. $\int_0^{\pi/6} \left(2 + 3x^2\right) \cos 3x dx$ is equal to

A. $\frac{4}{9} - \frac{\pi^2}{18}$

B. $\frac{4}{9} + \frac{\pi^2}{18}$

C. $\frac{4}{9} - \frac{\pi^2}{36}$

D. $\frac{4}{9} + \frac{\pi^2}{36}$

Answer: D

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106. $\int_0^2 xe^2 dx =$

A. $e^2 - 1$

B. $e - 1$

C. $e^2 + 1$

D. $e+1$

Answer: C

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107. $\int_0^{2\pi} e^x\left(\frac{x}{2}+\frac{\pi}{4}\right)dx =$

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $e^{2\pi}\left(\frac{5\pi}{4}-\frac{1}{2}\right)+\frac{1}{2}-\frac{\pi}{4}$

D. $e^{2\pi}\left(\frac{5\pi}{4}-\frac{1}{2}\right)+\frac{1}{2}+\frac{\pi}{4}$

Answer: C

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108. Evaluate the following definite integral: $\int_1^2 \log x \, dx$

A. $2\log 2 - 1$

B. $2\log 2 + 1$

C. $2\log 2 - 2$

D. $2\log 2 + 2$

Answer: A

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109. $\int_1^e \log(x)dx =$

A. 1

B. e

C. $e - 1$

D. $1 - e$

Answer: A

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110. Evaluate: $\int_1^2 \frac{\log x}{x^2} dx$

A. $\frac{1}{2}\log\left(\frac{2}{e}\right)$

B. $\frac{1}{2}\log\left(\frac{e}{2}\right)$

C. $2\log\left(\frac{2}{e}\right)$

D. $2\log\left(\frac{e}{2}\right)$

Answer: B

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111. $\int_1^3 x^3 \log x dx =$

A. $3\log - \frac{26}{3}$

B. $3\log 3 - \frac{26}{9}$

C. $9\log 3 - \frac{26}{3}$

D. $9\log 3 - \frac{26}{9}$

Answer: D

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112. Evaluate : $\int_0^{2\pi} e^x \cos\left(\frac{\pi}{4}+\frac{x}{2}\right)dx$

A. $\frac{-\sqrt{2}}{5}\left(e^{2\pi}-1\right)$

B. $\frac{\sqrt{2}}{5}\left(e^{2\pi}-1\right)$

C. $\frac{-\sqrt{2}}{5}\left(e^{2\pi}+1\right)$

D. $\frac{\sqrt{2}}{5}\left(e^{2\pi}+1\right)$

Answer: C

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113. integrate $\int_0^{2\pi} e^x . \sin\left(\frac{\pi}{4}+\frac{x}{2}\right)dx$

A. $\frac{-3\sqrt{2}}{5}\left(e^{2\pi}-1\right)$

B. $\frac{3\sqrt{2}}{5}\left(e^{2\pi}-1\right)$

C. $\frac{-3\sqrt{2}}{5}\left(e^{2\pi}+1\right)$

D. $\frac{3\sqrt{2}}{5}\left(e^{2\pi}+1\right)$

Answer: C

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114. $\int_{\pi/4}^{\pi/2} \cos 2x \log \sin x \quad dx =$

A. $\frac{1}{4}\log 2 - \frac{\pi}{8} + \frac{1}{4}$

B. $\frac{1}{4}\log 2 + \frac{\pi}{8} - \frac{1}{4}$

C. $\frac{1}{4}\log 2 - \frac{\pi}{8} - \frac{1}{4}$

D. $\frac{1}{4}\log 2 + \frac{\pi}{8} + \frac{1}{4}$

Answer: A

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115. $\int_0^{\pi} e^x \sin 2x dx =$

A. $\frac{2}{5}(1 - e^{\pi})$

B. $\frac{2}{5}(e^{\pi - 1})$

C. $\frac{1}{5}(1 - e^{\pi})$

D. $\frac{1}{5}(e^{\pi} - 1)$

Answer: A

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116. $\int_0^{\pi/2} e^x \cos x \quad dx =$

A. $\frac{1}{2}\left(1 - e^{\frac{\pi}{2}}\right)$

B. $\frac{1}{2}\left(e^{\frac{\pi}{2}} - 1\right)$

C. $1 - e^{\frac{\pi}{2}}$

D. $e^{\frac{\pi}{2}} - 1$

Answer: B

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117. $\int_0^1 x \tan^{-1} x \quad dx =$

A. $\frac{\pi}{4}+\frac{1}{2}$

B. $\frac{\pi}{4}-\frac{1}{2}$

C. $\frac{1}{2}-\frac{\pi}{4}$

D. $\frac{-\pi}{4}-\frac{1}{2}$

Answer: B

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118. $\int_0^1 x^3 \tan^{-1} x \quad dx =$

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

B. $\frac{1}{6}$

C. 3

D. 6

Answer: B

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119. If $\int_0^1 \tan^{-1} x \, dx = p$, then the value of $\int_0^1 \tan^{-1}\left(\frac{1-x}{1+x}\right) dx$ is

A. $\frac{\pi}{-p}$

B. $\frac{3\pi}{4} + p$

C. $\frac{\pi}{4} - \frac{p}{2}$

D. $\frac{3\pi}{4} + \frac{p}{2}$

Answer: A

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120. Evaluate the following :

$$\int_0^1 e^{x^2} . x^3 dx$$

A. $\frac{-1}{2}$

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

C. -2

D. 2

Answer: B

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121. $\int_0^1 \left(\cos^{-1} x\right)^2 dx$

A. $\frac{\pi}{2} + 1$

B. $\frac{\pi}{2} - 1$

C. $\pi + 2$

D. $\pi - 2$

Answer: D

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122. $\int_0^1 \frac{x\left(\sin^{-1} x\right)^2}{\sqrt{1-x^2}} dx =$

A. $\pi - 2$

B. $2 - \pi$

C. $2\pi - 2$

D. $2 - 2\pi$

Answer: A

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123. $\int_0^{1/\sqrt{2}} \frac{\sin^{-1} x}{(1-x^2)^{3/2}} dx = ?$

A. $\frac{\pi}{4} + \frac{1}{2}\log 2$

B. $\frac{\pi}{4} - \frac{1}{2}\log 2$

C. $\frac{\pi}{2} + \frac{1}{4}\log 2$

D. $\frac{\pi}{2} - \frac{1}{4}\log 2$

Answer: B

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

A. $\frac{\pi}{2} + 2\log 2$

B. $\frac{\pi}{2} - 2\log 2$

C. $\frac{\pi}{2} + \log 2$

D. $\frac{\pi}{2} - \log 2$

Answer: D

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125. Evaluate the following :

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

A. $\frac{\pi}{2} - \log 2$

B. $\frac{\pi}{4} - \log 2$

C. $\frac{\pi}{2} - \log\sqrt{2}$

D. $\frac{\pi}{4} - \log\sqrt{2}$

Answer: A

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126. $\int_0^1 \tan^{-1}\left(\frac{x}{\sqrt{1-x^2}}\right)dx =$

A. $\frac{\pi}{2} - 1$

B. $1-\frac{\pi}{2}$

C. $\frac{\pi}{2}-2$

D. $2-\frac{\pi}{2}$

Answer: A

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127. Evaluate: $\int_0^1 \frac{x\tan^{-1}x}{(1+x^2)^{3/2}}dx$

A. $\frac{4-\pi}{2\sqrt{2}}$

B. $\frac{4+\pi}{2\sqrt{2}}$

C. $\frac{4-\pi}{4\sqrt{2}}$

D. $\frac{4+\pi}{4\sqrt{2}}$

Answer: C

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128. $\int_0^{\pi/2} \sin 2x \tan^{-1}(\sin x) dx =$

A. $\frac{\pi}{2} - 1$

B. $1 - \frac{\pi}{2}$

C. $\frac{\pi}{4} - 1$

D. $1 - \frac{\pi}{4}$

Answer: A

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129. $\int_1^2 e^x \left(\frac{1}{x} - \frac{1}{x^2}\right) dx =$

A. $\frac{e^2}{2} + e$

B. $\frac{e^2}{2} - e$

C. $e - \frac{e^2}{2}$

D. $-e - \frac{e^2}{2}$

Answer: B

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130. Evaluate the following definite integral:

$\int_1^2 e^{2x} \left(\frac{1}{x} - \frac{1}{2x^2}\right) dx$

A. $\frac{e^2}{2}\left(\frac{e^2}{2} - 1\right)$

B. $\frac{e^2}{2}\left(1-\frac{e^2}{2}\right)$

C. $\frac{e^2}{4}\left(\frac{e^2}{2}-1\right)$

D. $\frac{e^2}{4}\left(1-\frac{e^2}{2}\right)$

Answer: A

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131. $\int_0^{\pi/4} e^x\left(1+\tan x+\tan^2 x\right)dx =$

A. $-e^{\frac{\pi}{4}}$

B. $e^{\frac{\pi}{4}}$

C. $-4e^{\frac{\pi}{4}}$

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

Answer: B

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132. Evaluate the following :

$$\int_{\pi/2}^{\pi} e^x \left(\frac{1 - \sin x}{1 - \cos x} \right) dx.$$

A. $-e^{\pi}$

B. e^{π}

C. $-e^{\frac{\pi}{2}}$

D. $e^{\frac{\pi}{2}}$

Answer: D

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133. $\int_e^{e^2}\left(\frac{1}{\log x}-\frac{1}{(\log x)^2}\right)dx=$

A. $\frac{e(e-1)}{2}$

B. $\frac{-e(e-1)}{2}$

C. $\frac{e(e-2)}{2}$

D. $\frac{-e(e-2)}{2}$

Answer: C

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134. $\int_1^{\pi/2}(\sin(\log x)+\cos(\log x))dx=$

A. $-\pi\cos\left(\log\left(\frac{\pi}{2}\right)\right)$

B. $\pi \cos\left(\log\left(\frac{\pi}{2}\right)\right)$

C. $-\frac{\pi}{2}\sin\left(\log\left(\frac{\pi}{2}\right)\right)$

D. $\frac{\pi}{2}\sin\left(\log\left(\frac{\pi}{2}\right)\right)$

Answer: D

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135. $\int_5^{10} \frac{dx}{(x-1)(x-2)} =$

A. $\log\left(\frac{32}{9}\right)$

B. $\log\left(\frac{9}{32}\right)$

C. $\log\left(\frac{32}{27}\right)$

D. $\log\left(\frac{27}{32}\right)$

Answer: C

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136. $\int_1^2 \frac{dx}{(x+1)(x+3)} =$

A. $\frac{1}{2}\log\left(\frac{6}{5}\right)$

B. $\frac{1}{2}\log\left(\frac{5}{6}\right)$

C. $\frac{1}{2}\log\left(\frac{3}{5}\right)$

D. $\frac{1}{2}\log\left(\frac{5}{3}\right)$

Answer: A

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137. $\int_2^3 \frac{x}{(x+2)(x+3)}dx =$

A. $\log\left(\frac{1728}{3125}\right)$

B. $\log\left(\frac{3456}{3125}\right)$

C. $\log\left(\frac{1728}{625}\right)$

D. $\log\left(\frac{3456}{625}\right)$

Answer: B

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138. Evaluate : $\int_1^2 \frac{x+3}{x(x+2)}dx$

A. $2\log 3$

B. $2\log 6$

C. $\frac{1}{2}\log 3$

D. $\frac{1}{2}\log 6$

Answer: D

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139. $\int_1^3 \frac{dx}{x(1+x^2)} =$

A. $\frac{1}{2}\log\left(\frac{5}{9}\right)$

B. $\frac{1}{2}\log\left(\frac{9}{5}\right)$

C. $\frac{1}{2}\log\left(\frac{10}{9}\right)$

D. $\frac{1}{2}\log\left(\frac{9}{10}\right)$

Answer: B

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140. If $\int_0^\infty \frac{x^2}{(x^2+a^2)(x^2+b^2)(x^2+c^2)}dx = \frac{\pi}{2(a+b)(b+c)(c+a)}$, then $\int_0^\infty \frac{dx}{(x^2+25)(x^2+36)} =$

A. $\frac{\pi}{440}$

B. $\frac{\pi}{550}$

C. $\frac{\pi}{330}$

D. $\frac{\pi}{660}$

Answer: D

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141. $\int_0^{\pi/2} \frac{\cos x}{(1+\sin x)(2+\sin x)} dx =$

A. $\log\left(\frac{2}{3}\right)$

B. $\log\left(\frac{3}{2}\right)$

C. $\log\left(\frac{4}{3}\right)$

D. $\log\left(\frac{3}{4}\right)$

Answer: C

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142. $\int_0^{\pi/2} \frac{\cos x}{(4+\sin x)(3+\sin x)} dx =$

A. $\log\left(\frac{16}{15}\right)$

B. $\log\left(\frac{15}{16}\right)$

C. $\log\left(\frac{4}{15}\right)$

D. $\log\left(\frac{15}{4}\right)$

Answer: A

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143. $\int_{\pi/3}^{\pi/2} \frac{dx}{\sin x + \sin 2x} =$

A. $\frac{2}{3}\log 2 - \frac{1}{2}\log 3$

B. $\frac{4}{3}\log 2 - \frac{1}{2}\log 3$

C. $\frac{2}{3}\log 2 - \frac{3}{2}\log 3$

D. $\frac{4}{3}\log 2 - \frac{3}{2}\log 3$

Answer: B

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144. Evaluate the following :

$$\int_0^{\pi/4} \frac{\sec^2 x}{(1+\tan x)(2+\tan x)} dx$$

A. $\log\left(\frac{3}{4}\right)$

B. $\log\left(\frac{4}{3}\right)$

C. $\log\left(\frac{3}{2}\right)$

D. $\log\left(\frac{2}{3}\right)$

Answer: B

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145. $\int_0^{\pi/2} \frac{\sin x \cos x}{(1+2\sin x)(1+\sin x)} dx =$

A. $\frac{1}{2}\log\left(\frac{3}{4}\right)$

B. $\frac{1}{2}\log\left(\frac{4}{3}\right)$

C. $\frac{1}{2}\log\left(\frac{3}{2}\right)$

D. $\frac{1}{2}\log\left(\frac{2}{3}\right)$

Answer: B

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146. If $f(a+b-x) = f(x)$, then $\int_a^b x f(x) dx =$

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

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

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

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

Answer: B

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147. If $\int_0^{\pi} xf\left(\cos^2 x+\tan^4 x\right)dx = k\int_0^{\pi/2} f\left(\cos^2 x+\tan^4 x\right)dx$ then k =

A. $\frac{\pi}{2}$

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

C. π

D. 1

Answer: C

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148. $\int_0^a (f(a+x)+f(a-x))dx =$

A. $2\int_0^{2a} f(x)dx$

B. $\int_0^{2a} f(x)dx$

C. $2\int_0^{a} f(x)dx$

D. $\int_0^{a} f(x)dx$

Answer: B

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149. If

$$\int_0^3 (3ax^2 + 2bx + c)dx = \int_1^3 (3ax^2 + 2bx + c)dx$$

where a, b, c are constants then $a + b + c =$

A. $a + b + c = 0$

B. $a + b + c = 1$

C. $a + b + c = 2$

D. $a + b + c = 3$

Answer: A

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150. Prove that

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

A. $\frac{b-a}{2}$

B. $\frac{b-a}{4}$

C. $\frac{b+a}{2}$

D. $\frac{b+a}{4}$

Answer: A

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151. $\int_1^2 \frac{\sqrt{x}}{\sqrt{3-x}+\sqrt{x}}dx =$

A. $\frac{-1}{2}$

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

C. $\frac{3}{2}$

D. $\frac{-3}{2}$

Answer: B

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152. $\int_2^7 \frac{\sqrt{x}}{\sqrt{x}+\sqrt{9-x}}dx =$

A. $\frac{9}{2}$

B. $\frac{-9}{2}$

C. $\frac{5}{2}$

D. $\frac{-5}{2}$

Answer: C

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153. $\int_4^7 \frac{(11-x)^2}{x^2+(11-x)^2}dx =$

A. $\frac{-11}{2}$

B. $\frac{11}{2}$

C. $\frac{-3}{2}$

D. $\frac{3}{2}$

Answer: D

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154. $\int_0^{\pi/2} \sin^2 x \cos^3 x \quad dx =$

A. π

B. 0

C. $\frac{\pi}{2}$

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

Answer: B

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155. $\int_0^{\pi/2} \frac{\sin x - \cos x}{1 - \sin x \cos x} dx =$

A. $\frac{\pi}{2}$

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

C. π

D. 0

Answer: D

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

A. 0

B. π

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

D. $\frac{\pi}{2}$

Answer: A

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157. $\int_0^{2\pi} \frac{\sin 2\theta}{a - b\cos 2\theta} d\theta =$

A. 0

B. 2

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

D. $\frac{\pi}{2}$

Answer: A

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158. $\int_0^{\pi/2} \cos^2\theta d\theta =$

A. 0

B. 2

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

D. $\frac{\pi}{2}$

Answer: C

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159. The value of the integral $\int_0^{\pi/2} \left(\sin^{100} x - \cos^{100} x\right) dx$ is

A. $\frac{1}{100}$

B. $\frac{100}{(100)^{100}}$

C. $\frac{\pi}{100}$

D. 0

Answer: D

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160. $\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx =$

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

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

C. $\frac{3\pi}{4}$

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

Answer: A

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161. $\int_{\frac{\pi}{5}}^{3\frac{\pi}{10}} \frac{\sin x}{(\sin x + \cos x)dx}$

A. $\frac{3\pi}{4}$

B. $\frac{\pi}{10}$

C. $\frac{\pi}{5}$

D. $\frac{\pi}{20}$

Answer: D

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162. $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x}+\sqrt{\cos x}}dx =$

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

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

C. $\frac{\pi}{2}$

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

Answer: D

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163. Evaluate : $\int_0^{\frac{\pi}{2}} \frac{dx}{1+\sqrt{\tan x}}$

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

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

C. $\frac{\pi}{2}$

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

Answer: D

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164. Evaluate the following :

$$\int_{\pi/6}^{\pi/3} \frac{1}{1+\sqrt{\cot x}}dx$$

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

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

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

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

Answer: A

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165. Evaluate the following :

$$\int_0^{\pi/2} \frac{\sqrt[3]{\sec x}}{\sqrt[3]{\sec x} + \sqrt[3]{\text{cosec x}}} dx$$

A. $\frac{\pi}{2}$

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

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

D. $\frac{3\pi}{4}$

Answer: C

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166. $\int_0^{\pi/2} \frac{\sqrt[n]{\sec x}}{\sqrt[n]{\sec x} + \sqrt[n]{\operatorname{cosec}\ x}} dx =$

A. $\frac{\pi}{2}$

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

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

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

Answer: C

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167. $\int_0^{\pi/2} \frac{e^{x^2}}{e^{x^2}+e^{\left(\frac{\pi}{2}-x\right)^2}}dx =$

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

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

C. $\frac{\pi^2}{e^{16}}$

D. $\frac{\pi^2}{e^4}$

Answer: A

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168. The integral $\int_2^4 \frac{\log x^2}{\log x^2 + \log(36-12x+x^2)dx}$ is equal to: (1) 2 (2) 4 (3) 1 (4) 6

A. 1

B. 6

C. 2

D. 4

Answer: A

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169. $\int_0^1 \log\left(\frac{1}{x} - 1\right) dx =$

A. 0

B. 1

C. -1

D. ± 1

Answer: A

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170. $\int_0^{\pi/2} \frac{\cos x}{(\sin x + \cos x)^2} dx =$

A. $\frac{1}{\sqrt{2}} \log\left(\frac{\sqrt{2}+1}{\sqrt{2}-1}\right)$

B. $\frac{1}{\sqrt{2}} \log\left(\frac{\sqrt{2}-1}{\sqrt{2}+1}\right)$

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

D. $\frac{1}{2\sqrt{2}} \log\left(\frac{\sqrt{2}-1}{\sqrt{2}+1}\right)$

Answer: C

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171. $\int_0^{\pi/2} \frac{\sin x}{(\sin x + \cos x)^2} dx =$

A. $\frac{1}{2\sqrt{2}} \log\left(\frac{\sqrt{2}+1}{\sqrt{2}-1}\right)$

B. $\frac{1}{2\sqrt{2}} \log\left(\frac{\sqrt{2}-1}{\sqrt{2}+1}\right)$

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

D. $\frac{1}{\sqrt{2}} \log\left(\frac{\sqrt{2}-1}{\sqrt{2}+1}\right)$

Answer: A

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172. $\int_0^{\pi/2} \frac{\cos^2 x}{\sin x + \cos x} dx =$

A. $\frac{1}{2\sqrt{2}}\log\left(\frac{\sqrt{2}-1}{\sqrt{2}+1}\right)$

B. $\frac{1}{2\sqrt{2}}\log\left(\frac{\sqrt{2}+1}{\sqrt{2}-1}\right)$

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

D. $\frac{1}{\sqrt{2}}\log\left(\frac{\sqrt{2}+1}{\sqrt{2}-1}\right)$

Answer: B

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173. $\int_0^{\pi/2} \frac{\sin x}{(\sin x+\cos x)^3}dx =$

A. $\frac{1}{4}$

B. $\frac{-1}{4}$

C. $\frac{1}{2}$

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

Answer: C

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174. $\int_0^{\pi/2} \frac{\sin x}{(\sin x + \cos x)^2} dx =$

A. $\frac{\pi}{2}$

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

C. $\frac{1}{2}$

D. $\frac{1}{4}$

Answer: C

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175. $\int_0^a \frac{dx}{x+\sqrt{a^2-x^2}}$

A. $\frac{\pi}{2}$

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

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

D. $\frac{3\pi}{4}$

Answer: B

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176. Find the value of $\int_0^1 x(1-x)^n dx$

A. $\frac{1}{n+1}$

B. $\frac{1}{n+2}$

C. $\frac{1}{n+1} - \frac{1}{n+2}$

D. $\frac{1}{n+1} + \frac{1}{n+2}$

Answer: C

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177. Evaluate : $\int_0^1 x(1-x)^5 dx$

A. $\frac{1}{42}$

B. $\frac{13}{42}$

C. $\frac{1}{6}$

D. $\frac{1}{7}$

Answer: A

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178. $\int_0^1 x^2\sqrt{1-x^2}dx =$

A. $\frac{8}{21}$

B. $\frac{16}{21}$

C. $\frac{8}{105}$

D. $\frac{16}{105}$

Answer: D

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179. Evaluate the following :

$$\int_0^a x^2(a-x)^{\frac{3}{2}}dx.$$

A. $\frac{8}{315}a^{\frac{9}{2}}$

B. $\frac{16}{315}a^{\frac{9}{2}}$

C. $\frac{8}{315}a^{\frac{5}{2}}$

D. $\frac{16}{315}a^{\frac{5}{2}}$

Answer: B

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180. $f(x) = \begin{cases} 1-2x, \text{ for } & x \leq 0 \\ 1+2x, \text{ for } & x > 0 \end{cases}$ then $\int_{-1}^{1} f(x)dx =$

A. 4

B. -4

C. 2

D. -2

Answer: A

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181. If $\int_{-1}^{4} f(x)dx = 4$ and $\int_{2}^{4} (3 - f(x))dx = 7$, then $\int_{-1}^{2} f(x)dx =$

A. -2

B. 3

C. 4

D. 5

Answer: D

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182. $\int_{-1}^{1} |x| dx = ?$

A. 1

B. -1

C. 2

D. 0

Answer: A

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183. $\int_0^3 |x-2|dx =$

A. $\frac{3}{2}$

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

C. $\frac{5}{2}$

D. $\frac{5}{4}$

Answer: C

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184. $\int_0^3 |5x-3|dx =$

A. $\frac{-13}{10}$

B. $\frac{13}{10}$

C. $\frac{-13}{5}$

D. $\frac{13}{5}$

Answer: B

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185. $\int_{-2}^{2} \left|1 - x^2\right| dx =$

A. 2

B. 4

C. 6

D. 8

Answer: B

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186. $\int_0^{\pi/2} \left|\sin\left(x - \frac{\pi}{4}\right)\right| dx =$

A. $2 + \sqrt{2}$

B. $2 - \sqrt{2}$

C. $-2 + \sqrt{2}$

D. $-2 - \sqrt{2}$

Answer: B

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187. $\int_0^{\pi/2} |\sin x - \cos x| dx =$

A. 0

B. $\sqrt{2} - 1$

C. $2\sqrt{2} - 2$

D. $2\sqrt{2} + 2$

Answer: C

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188. $\int_0^{2\pi} (\sin x + |\sin x|) dx =$

A. o

B. 1

C. 4

D. 8

Answer: C

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189. The value of the integral $\int_{1/e}^{e} |\log x| dx$, is

A. $1 + \frac{1}{e}$

B. $1 - \frac{1}{e}$

C. $2 + \frac{2}{e}$

D. $2 - \frac{2}{e}$

Answer: D

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190. $\int_{-1}^{1} e^{|x|} dx$

A. $e + 1$

B. $e - 1$

C. $2e + 2$

D. $2e - 2$

Answer: D

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191. The integral $\int_0^{\pi} \sqrt{1+4\frac{\sin^2 x}{2}-4\frac{\sin x}{2}}dx$ equal (1) $\pi-4$ (2) $\frac{2\pi}{3}-4-4\sqrt{3}$ (3) $4\sqrt{3}-4$ (4) $4\sqrt{3}-4-\frac{\pi}{3}$

A. $\pi-4$

B. $4\sqrt{3}-4$

C. $\frac{2\pi}{3}-4-4\sqrt{3}$

D. $4\sqrt{3}-4-\frac{\pi}{3}$

Answer: D

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192. $\int_0^3 [x]dx =$ _____ where [x] is greatest integer function

A. 3

B. 0

C. 2

D. 1

Answer: A

Watch Video Solution

193. $\int_0^{\pi} x \sin^2 x dx =$

A. $\frac{\pi}{2}$

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

C. $\frac{\pi^2}{2}$

D. $\frac{\pi^2}{4}$

Answer: D

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194. Evaluate the following :

$$\int_0^{\pi} x \sin^3 x dx$$

A. $\frac{4\pi}{3}$

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

C. 4π

D. 2π

Answer: B

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195. $\int_0^{\frac{\pi}{2}} \sin^2 x \cos x dx$

A. $\frac{-2\pi}{5}$

B. $\frac{-\pi}{5}$

C. $\frac{2\pi}{5}$

D. $\frac{\pi}{5}$

Answer: D

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

A. $\frac{\pi}{2ab}$

B. $\frac{\pi}{4ab}$

C. $\frac{\pi^2}{2ab}$

D. $\frac{\pi^2}{4ab}$

Answer: C

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197. Evaluate the following :

$$\int_0^{\pi} \frac{x \tan x}{\sec x \operatorname{cosec} x} dx$$

A. $\frac{\pi^2}{2}$

B. $\frac{\pi^2}{4}$

C. $\frac{\pi}{2}$

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

Answer: B

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

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

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

C. $\frac{\pi^2}{2} + \pi$

D. $\frac{\pi^2}{2} - \pi$

Answer: D

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199. Prove that $\int_0^{\pi} \frac{x \tan x}{(\sec x + \tan x)} dx = \pi\left(\frac{\pi}{2} - 1\right).$

A. $\frac{\pi}{2}(\pi - 2)$

B. $\frac{\pi}{4}(\pi - 2)$

C. $\frac{\pi}{2}(\pi - 1)$

D. $\frac{\pi}{4}(\pi - 1)$

Answer: A

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200. Evaluate the following :

$$\int_0^{\pi} \frac{x \tan x}{\sec x + \cos x} dx$$

A. $\frac{\pi^2}{2}$

B. $\frac{\pi^2}{4}$

C. $\frac{\pi}{2}$

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

Answer: B

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201. $\int_0^{\pi} \log(1+\cos x)dx = -\pi(\log 2)$

A. $-\pi \log 2$

B. $\pi \log 2$

C. $\frac{\pi}{2}\log 2$

D. $\frac{-\pi}{2}\log 2$

Answer: A

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202. Prove that

$$\int_0^{\pi/2} \log(\sin x)dx = \int_0^{\pi/2} \log(\cos x)dx = -\frac{\pi}{2}\log 2.$$

A. $\frac{\pi}{4}\log 2$

B. $\frac{-\pi}{4}\log 2$

C. $\frac{\pi}{2}\log 2$

D. $\frac{-\pi}{2}\log 2$

Answer: D

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203. $\int_0^{\frac{\pi}{2}} \log(\sin x)dx$

A. $\frac{-\pi}{4}\log^2$

B.

C.

D.

Answer: C

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204. The value of $\int_0^{\pi/2} \log(\text{cosec}\ \ x)dx$ is

A. $\frac{\pi}{2}\log 2$

B. $\frac{-\pi}{2}\log 2$

C. $\frac{\pi}{4}\log 2$

D. $\frac{-\pi}{4}\log 2$

Answer: A

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205. $\int_0^{\pi/2} \log(\sec x)dx =$

A. $\frac{-\pi}{2}\log 2$

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

C. $\frac{-\pi}{4}\log 2$

D. $\frac{\pi}{4}\log 2$

Answer: B

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206. If $\int_0^{\pi/2} \log\cos x dx = \frac{\pi}{2}\log\left(\frac{1}{2}\right)$, then $\int_0^{\pi/2} \log\sec x dx =$

A. $\frac{\pi}{2}\log 2$

B. $\frac{-\pi}{2}\log 2$

C. $\frac{\pi}{4}\log 2$

D. $\frac{-\pi}{4}\log 2$

Answer: A

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207. The value of the integral $\int_0^1 x \log \sin\left(\frac{\pi x}{2}\right) dx$ is

A. $-\log 2$

B. $\log 2$

C. $\frac{-\pi}{2}\log 2$

D. $\frac{\pi}{2}\log^2$

Answer: A

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208. $\int_0^{\pi/2} \left(\frac{\theta}{\sin\theta}\right)^2 d\theta =$

A. $\frac{\pi}{\log 2}$

B. $\log 2$

C. $\pi \log 2$

D. π

Answer: C

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209. $\int_0^{\pi/2} \log(\tan x) dx =$

A. 0

B. π

C. $\frac{\pi}{2}$

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

Answer: A

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210. $\int_0^{\pi/2} \log(\cot x) dx =$

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

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

C. 0

D. π

Answer: C

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211. Evaluate $\int_0^{\frac{\pi}{4}} \log(1+\tan x)dx$

A. $\frac{-\pi}{8}\log 2$

B. $\frac{-\pi}{4}\log 2$

C. $\frac{\pi}{8}\log 2$

D. $\frac{\pi}{\log 2}$

Answer: C

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212. $\int_0^{\pi/2} (2\log\sin x - \log\sin 2x)dx =$

A. $\frac{\pi}{2}\log 2$

B. $-\frac{\pi}{2}\log 2$

C. $\frac{\pi}{4}\log 2$

D. $\frac{-\pi}{4}\log 2$

Answer: B

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213. $\int_0^{\pi/2} \sin 2x(\tan x)dx =$

A. 0

B. π

C. $\frac{\pi}{2}$

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

Answer: C

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214. $\int_0^{\pi/2} \log\left(\frac{1+\sin x}{1+\cos x}\right) dx =$

A. 0

B. π

C. $\frac{\pi}{2}$

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

Answer: A

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215. $\int_0^1 \tan^{-1}\left(\frac{2x-1}{1+x-x^2}\right) dx =$

A. -1

B. 0

C. 1

D. ± 1

Answer: B

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216. $\int_0^{\pi} x \log \sin x dx$

A. $\frac{-\pi^2}{2} \log 2$

B. $\frac{\pi^2}{2} \log 2$

C. $\frac{-\pi}{2} \log 2$

D. $\frac{\pi}{2}\log 2$

Answer: A

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217. $\int_0^1 \frac{\log(1+x)}{1+x^2}dx$

A. $\frac{\pi}{2}\log 2$

B. $\frac{\pi}{4}\log 2$

C. $\frac{\pi}{8}\log 2$

D. $\frac{\pi}{16}\log 2$

Answer: C

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218. The value of $\int_0^\infty \frac{\log x}{1+x^2} dx$, is

A. $\log 2$

B. $-\log 2$

C. $\log 1$

D. $\log 4$

Answer: C

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219. $\int_{-a}^{a} \frac{dx}{x+x^3} =$

A. 0

B. $\int_0^a \frac{dx}{1+x^6}$

C. $2\int_0^a \frac{dx}{1+x^3}$

D. $2\int_0^a \frac{dx}{x+x^3}$

Answer: A

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220. $\int_{-1}^{1} \frac{x^2}{1+x^2} dx =$

A. $2 - \frac{\pi}{2}$

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

C. $1 - \frac{\pi}{2}$

D. $1+\frac{\pi}{2}$

Answer: A

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221. $\int_{-1/2}^{1/2} \frac{1+x^3}{4-x^2}dx =$

A. $\frac{1}{2}\log\left(\frac{5}{3}\right)$

B. $\frac{1}{2}\log\left(\frac{3}{5}\right)$

C. $\frac{1}{4}\log\left(\frac{5}{3}\right)$

D. $\frac{1}{4}\log\left(\frac{3}{5}\right)$

Answer: A

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222. $\int_{-1}^{1} \frac{1+x^3}{9-x^2} dx =$

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

B. $\frac{1}{6}\log 2$

C. $\frac{1}{3}\log 2$

D. $\frac{3}{2}\log 2$

Answer: C

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223. $\int_{-1}^{1} \left(\sqrt{1+x+x^2} - \sqrt{1-x+x^2}\right) dx =$

A. 0

B. 1

C. -1

D. 2

Answer: A

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224. $\int_{-9}^{9} \frac{x^3}{4-x^2} dx =$

A. 0

B. 9

C. -9

D. 18

Answer: A

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225. Evaluate: $\int_{-a}^{a} \sqrt{\frac{a-x}{a+x}}\, dx$

A. $-2a\pi$

B. $2a\pi$

C. $-a\pi$

D. $a\pi$

Answer: D

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226. Evaluate: $\int_{\pi/4}^{\pi/4} \frac{x+\pi/4}{2-\cos 2x} dx$

A. $\frac{\pi^2}{3\sqrt{3}}$

B. $\frac{\pi^2}{6\sqrt{3}}$

C. $\frac{\pi}{3\sqrt{3}}$

D. $\frac{\pi}{6\sqrt{3}}$

Answer: B

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227. $\int_{-\pi}^{\pi} \frac{2x(1+\sin x)}{1+\cos^2} dx$ is

A. π

B. 2π

C. π^2

D. $2\pi^2$

Answer: C

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228. $\int_{-\pi/4}^{\pi/4} x^3 \sin^4 x dx =$

A. 0

B. 2

C. $\frac{\pi}{2}$

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

Answer: A

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229. $\int_{-\pi/2}^{\pi/2} \sin^3 x dx =$

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

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

C. 0

D. π

Answer: C

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230. $\int_{-\pi/2}^{\pi/2} \sin^2 x dx$

A. $\frac{\pi}{2}$

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

C. $\frac{\pi}{2} - \frac{1}{4}$

D. $\frac{\pi}{4} - \frac{1}{2}$

Answer: A

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231. $\int_{-\pi/2}^{\pi/2} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx =$

A. $\frac{\pi}{2}$

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

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

D. $\frac{3\pi}{4}$

Answer: A

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232. $\int_{-\pi}^{\pi} \frac{\sin^4 x}{\sin^4 x + \cos^4 x} dx =$

A. π

B. 2π

C. $\frac{\pi}{2}$

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

Answer: A

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233. The value of $\int_{-\pi}^{\pi} \sin^3 x \cos^2 x dx$ is. . . .

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

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

C. 0

D. π

Answer: C

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234. $\int_{-\pi/4}^{\pi/4} \tan^2 x \sec(x) dx =$

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

B. $\frac{-\pi}{4}$

C. 0

D. $\frac{\pi}{2}$

Answer: C

View Text Solution

235. $\int_{-\pi/2}^{\pi/2} \sqrt{\frac{1-\cos 2x}{2}} dx =$

A. 0

B. 2

C. $\frac{1}{2}$

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

Answer: A

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236. $\int_{-1/2}^{1/2} (\cos x) \log\left(\frac{1-x}{1+x}\right) dx =$

A. 0

B. 1

C. $\sqrt{e}$

D. $2\sqrt{e}$

Answer: A

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237. Evaluate the following :

$$\int_{-\pi/2}^{\pi/2} \log\left(\frac{2-\sin x}{2+\sin x}\right) dx$$

A. 1

B. 3

C. 2

D. 0

Answer: D

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238. $\int_{-3}^{3} \log\left(\frac{9-x}{9+x}\right) dx =$

A. 4

B. -4

C. 8

D. 0

Answer: D

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239. The value

$$\int_{-2}^{2}\left(p\log\left(\frac{1+x}{1-x}\right)+q\log\left(\frac{1-x}{1+x}\right)^{-2}+r\right)dx$$

depends on the value of

A. p

B. q

C. r

D. p, q, r

Answer: C

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240. Evaluate: $\int_{-\pi/2}^{\pi/2}\frac{\cos x}{1+e^{x}}dx$

A. 0

B. -1

C. 1

D. ± 1

Answer: C

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241. If $\int_0^{\alpha} (3x^2 + 2x + 1)dx = 14, \quad \text{then} \quad \alpha =$

A. 1

B. 2

C. -1

D. -2

Answer: B

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242. If $\int_0^{\pi/2} \log(\cos x)dx = \frac{\pi}{2}\log\left(\frac{1}{2}\right)$, then $\int_0^{\pi/2} \log(\sec x)dx =$

A. $\frac{\pi}{2}\log\left(\frac{1}{2}\right)$

B. $1 - \frac{\pi}{2}\log\left(\frac{1}{2}\right)$

C. $1 + \frac{\pi}{2}\log\left(\frac{1}{2}\right)$

D. $\frac{\pi}{2}\log 2$

Answer: D

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243. The Integral $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{dx}{1+\cos x}$ is equal to: (2) (3) (4)

A. -1

B. -2

C. 2

D. 4

Answer: C

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