MATHS

BOOKS - TARGET MATHS (HINGLISH)

INTEGRATION

CLASSICAL THINKING

1. $\int 7e^{7x+5}dx=$

A. $7\left(7e^{7x+5}\right)+c$

B. $\frac{7\left(e^{7x+5}\right)}{5}+c$

C. $e^{7x+5}+c$

D. $\frac{7e^{7x+5}}{(7x+5)}+c$

Answer: C

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2. $\int \left(a^x - a^{2x}\right) dx =$

A. $\left(\frac{a^{x+1}}{x+1} - \frac{a^{2x+1}}{2x+1}\right) + c$

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

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

D. $\frac{1}{\log a}\left(a^x - a^{2x}\right) + c$

Answer: C

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3. $\int \frac{2^x + 3^x}{5^x} dx =$

A. $x\log\left(\frac{2}{5}\right) + x\log\left(\frac{3}{5}\right) + c$

B. $\log\left(\frac{2}{5}\right) + \log\left(\frac{3}{5}\right) + c$

C. $\frac{\left(\frac{2}{5}\right)^x}{\log\left(\frac{2}{5}\right)} + \frac{\left(\frac{3}{5}\right)^x}{\log\left(\frac{3}{5}\right)} + c$

D. $\left(\frac{2}{5}\right)^x \log\left(\frac{2}{5}\right) + \left(\frac{3}{5}\right)^x \log\left(\frac{3}{5}\right) + c$

Answer: C

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4. The value of $\int \frac{1}{(x-5)^2} dx$ is

A. $\frac{1}{x-5} + c$

B. $-\frac{1}{x-5} + c$

C. $\frac{2}{(x-5)^3} + c$

D. $-2(x-5)^3 + c$

Answer: B

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5. The value of $\int \frac{dx}{\sqrt{1-x}}$ is

A. $2\sqrt{1-x}+c$

B. $-2\sqrt{1-x}+c$

C. $-\sin^{-1}\sqrt{x}+c$

D. $\sin^{-1}\sqrt{x}+c$

Answer: B

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6. If $f(x)=\frac{x^2-1}{x^3}$, then $\int f(x)dx$ is

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

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

C. $-\frac{1}{x^2}+\frac{3}{x^4}+c$

D. $\log x+\frac{1}{2x^3}+c$

Answer: B

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7. $\int \frac{3x^3-2\sqrt{x}}{x}dx=$

A. $x^3-\sqrt{x}+c$

B. $x^3+\sqrt{x}+c$

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

D. $x^3-4\sqrt{x}+c$

Answer: D

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8. $\int \frac{ax^{-2} + bx^{-1} + c}{x^{-3}} dx =$

A. $2ax^2 + 3bx^3 + 4cx^4 + k$

B. $6ax^2 + 4bx^3 + 3cx^4 + k$

C. $a + b + cx^2 + k$

D. $\frac{1}{2}ax^2 + \frac{1}{3}bx^3 + \frac{1}{4}cx^4 + k$

Answer: D

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9. Evaluate $\int \left(x + \frac{1}{x}\right)^3 dx, x > 0$

A. $\frac{1}{4}\left(x + \frac{1}{x}\right)^4 + c$

B. $\frac{x^4}{4} + \frac{3x^2}{2} + 3\log x - \frac{1}{2x^2} + c$

C. $\frac{x^4}{4} + \frac{3x^2}{2} + 3\log x + \frac{1}{x^2} + c$

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

Answer: B

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

A. $4x^2+12x+6\log x-\frac{1}{x}+c$

B. $4x^2+12x-6\log x-\frac{2}{x}+c$

C. $2x^2+8x+3\log x-\frac{2}{x}+c$

D. $8x^2+6x+6\log x+\frac{2}{x}+c$

Answer: A

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11. $\int \frac{3x^3-2\sqrt{x}}{x} dx =$

A. $x^3 - \sqrt{x} + c$

B. $x^3 + \sqrt{x} + c$

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

D. $x^3 - 4\sqrt{x} + c$

Answer: D

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12. $\int \frac{\left(\sqrt{x} + \sqrt[3]{x^2}\right)^2}{x} dx =$

A. $x + \frac{12}{7}x^{\frac{7}{6}} + \frac{3}{4}x^{\frac{4}{3}} + c$

B. $\frac{2x^{\frac{3}{2}}}{3} + \frac{3x^{\frac{7}{3}}}{7} + c$

C. $x + \frac{4}{5}x^{\frac{5}{6}} + c$

D. $x + \frac{12}{5}x^{\frac{5}{6}} + c$

Answer: A

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

A. $\log x + c$

B. $(\log x)\left(\tan^{-1} x\right) + c$

C. $2\log x + \tan^{-1} x + c$

D. $\log x + 2\tan^{-1} x + c$

Answer: D

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

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

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

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

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

Answer: B

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15. $\int \frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x} dx =$

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: A

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16. $\int\left(\sqrt{1+\cos x}dx\right.$ equals

A. $2\sqrt{2}\sin\left(\frac{x}{2}\right)+c$

B. $-2\sqrt{2}\sin\left(\frac{x}{2}\right)+c$

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

D. $2\sqrt{2}\cos\left(\frac{x}{2}\right)+c$

Answer: A

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17. $\int\left(\cos\left(\frac{x}{2}\right)-\sin\left(\frac{x}{2}\right)\right)^2 dx =$

A. $x+\cos x+c$

B. $2\cos^2\left(\frac{x}{2}\right)+c$

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

D. $x - \cos x + c$

Answer: A

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18. If $f'(x) = x^2 + 5$ and $f(0) = -1$ then $f(x) =$

A. $x^3 + 5x - 1$

B. $x^3 + 5x + 1$

C. $\frac{1}{3}x^3 + 5x - 1$

D. $\frac{1}{3}x^2 + 5x + 1$

Answer: C

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19. If $f'(x) = x + \frac{1}{x}$ & f(1) = 5/2 then f(x) = ?

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

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

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

D. $\log x - \frac{x^2}{2} + 1$

Answer: A

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20. $\int \sin x \cos^4 x dx =$

A. $5\cos^5 x + c$

B. $-\frac{1}{5}\cos^5 x + c$

C. $-\frac{1}{5}\cos^5 x \cdot \sin^4 x + c$

D. $\cos^5 x \sin^4 x + c$

Answer: B

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

A. $(1+\log x)^3 + c$

B. $3(1+\log x)^3 + c$

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

D. $2(1+\log x)^3 + c$

Answer: C

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22. $\int x\sqrt{1+x^2}dx =$

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

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

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

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

Answer: D

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

A. $\log\left(1+x^2\right)+c$

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

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

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

Answer: C

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24. $\int \frac{\sec^2 x}{(1+\tan x)}dx$

A. $\log|\cos x + \sin x| + c$

B. $\log\left|\sec^2 x\right| + c$

C. $\log|1 + \tan x| + c$

D. $-\frac{1}{(1 + \tan x)^2} + c$

Answer: C

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25. $\int \frac{\cot x}{\log(\sin x)} dx$

A. $\log(\log\sin x) + c$

B. $\log(\log\cos ec x) + c$

C. $2\log(\log\sin x) + c$

D. None of these

Answer: A

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26. $\int \frac{\sin 2x}{1+\sin^2 x} dx =$

A. $\log(\sin 2x) + c$

B. $\log\left(1+\sin^2 x\right) + c$

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

D. $\tan^{-1}(\sin x) + c$

Answer: B

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27. $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} . dx$

A. $\log\left|e^x - e^{-x}\right| + c$

B. $\log\left|e^x + e^{-x}\right| + c$

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

D. $\log\left|1 + e^{2x}\right| + c$

Answer: B

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28. $\int \frac{1}{\cos^{-1}x.\sqrt{1 - x^2}}dx =$

A. $\log\left|\cos^{-1}x\right| + c$

B. $-\log\left|\cos^{-1}x\right| + c$

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

D. $\frac{1}{2\left(\cos^{-1}x\right)^2} + c$

Answer: B

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

A. $\log \left| x + \cos^2 x \right| + c$

B. $-\cos^2 x \log \left| \frac{x^2}{2} + \frac{\sin^3 x}{3} \right| + c$

C. $\log \left| \frac{x + \cos^2 x}{1 - \sin 2x} \right| + c$

D. $\log \left| x + \sin^2 x \right| + c$

Answer: A

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30. $\int \frac{\cos \sqrt{x}}{\sqrt{x}} dx$

A. $2\cos \sqrt{x} + c$

B. $2\sin \sqrt{x} + c$

C. $\sin \sqrt{x} + c$

D. $\frac{1}{2}\cos\sqrt{x} + c$

Answer: B

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31. $\int \frac{e^{\sqrt{x}}\cos\left(e^{\sqrt{x}}\right)}{\sqrt{x}} dx = ?$

A. $2\sin\left(e^{\sqrt{x}}\right) + c$

B. $\sin\left(e^{\sqrt{x}}\right) + c$

C. $2\cos\left(\sqrt{x}\right) + c$

D. $-2\sin\left(e^{\sqrt{x}}\right) + c$

Answer: A

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32. $\int \frac{1}{\log a}\left(a^x \cos a^x\right) dx =$

A. $\sin a^x + c$

B. $a^x \sin a^x + c$

C. $\frac{1}{(\log a)^2} \sin a^x + c$

D. $\log\left(\sin a^x\right) + c$

Answer: C

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33. $\int \frac{\tan(\log x)}{x} dx = ?$

A. $\log|\sin(\log x)| + c$

B. $\log|\cos(\log x)| + c$

C. $\log|\sec(\log x)| + c$

D. $\log|\operatorname{cosec}(\log x)| + c$

Answer: C

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34. $\int \frac{\sec^2(\log x)}{x} dx$

A. $\tan(\log x) + c$

B. $\tan^2(\log x) + c$

C. $\sec x \tan(\log x) + c$

D. $\sec(\log x)\tan x + c$

Answer: A

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35. $\int \frac{\log(\log x)}{x . \log x} dx =$

A. $[\log(\log x)]^2 + c$

B. $\frac{1}{2}[\log(\log x)]^2 + c$

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

D. $x\log(\log x) + c$

Answer: B

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36. $\int \sec x \log(\sec x + \tan x) dx$

A. $(\sec x + \tan x)\log(\sec x + \tan x) + c$

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

C. $\log[\log(\sec x + \tan x)] + c$

D. $\frac{1}{2}\log(\sec x + \tan x) + c$

Answer: B

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37. $\int \frac{1}{\sqrt{1 - 16x^2}}$

A. $\frac{1}{4}\sin^{-1}(4x) + c$

B. $4\sin^{-1}(4x) + c$

C. $\sqrt{1 - 16x^2} + c$

D. $4\sqrt{1 - 16x^2} + c$

Answer: A

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38. $\int \frac{dx}{\sqrt{2x - x^2}}$

A. $\cos^{-1}(x - 1) + c$

B. $\sin^{-1}(x - 1) + c$

C. $\cos^{-1}(1 + x) + c$

D. $\sin^{-1}(1 - x) + c$

Answer: B

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39. $\int \frac{dx}{x^2 - 2x + 2} =$

A. $\frac{1}{2}\tan^{-1}(x - 1) + c$

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

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

D. $\frac{1}{2}\log\left|\frac{x - \sqrt{2}}{x + \sqrt{2}}\right| + c$

Answer: B

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40. $\int \frac{1}{x^2 + 4x + 13} dx$ is equal to

A. $\log\left|x^2 + 4x + 13\right| + c$

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

C. $\log|2x + 4| + c$

D. $\frac{2x + 4}{\left(x^2 + 4x + 13\right)^2} + c$

Answer: B

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41. Integration of $\frac{1}{9x^2 - 25}$ with respect to x is

A. $\frac{1}{30}\log\left|\frac{3x + 5}{3x - 5}\right| + c$

B. $\frac{1}{27}\log\left|\frac{3x - 5}{3x + 5}\right| + c$

C. $\frac{1}{30}\log\left|\frac{3x - 5}{3x + 5}\right| + c$

D. $\frac{1}{27}\log\left|\frac{3x + 5}{3x - 5}\right| + c$

Answer: C

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42. $\int x\cos x dx =$

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

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

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

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

Answer: C

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43. $\int xe^x dx = ?$

A. $(x + 1)e^x + c$

B. $(x - 1)e^x + c$

C. $xe^x + 1 + c$

D. $xe^x - 1 + c$

Answer: B

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44. The anti-derivative of $\frac{x}{\cos^2 x}$ is

A. $x\tan x + c$

B. $\log|\cos x| + c$

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

D. $\cot x + c$

Answer: C

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45. $\int x\sin 2x dx = ?$

A. $\frac{\cos 2x}{4} + \frac{x\sin 2x}{2} + c$

B. $\frac{\cos 2x}{4} - \frac{x\sin 2x}{2} + c$

C. $\frac{\sin 2x}{4} - \frac{x\cos 2x}{2} + c$

D. $\frac{\sin 2x}{4} + \frac{x\cos 2x}{2} + c$

Answer: C

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46. $\int x^2 \log x dx =$

A. $\frac{1}{3}x^3\log x - \frac{1}{9}x^3 + c$

B. $x^3\log x - \frac{1}{9}x^3 + c$

C. $\frac{1}{3}x^3\log x + \frac{1}{9}x^3 + c$

D. $x^3\log x + \frac{1}{9}x^3 + c$

Answer: A

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47. The value of $\int (x - 1)e^{-x}$ dx is equal to

A. $xe^{-x} + c$

B. $-xe^{-x} + c$

C. $xe^{x} + c$

D. $xe^{x} + c$

Answer: B

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48. If $\int e^{x} \sin x dx = \frac{u}{2}e^{x} + c$, then `u=

A. $\frac{e^{x}}{2}(\sin x - \cos x) + c$

B. $-\cos x e^x + e^x \sin x + c$

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

D. $e^x(-\sin x - \cos x) + c$

Answer: A

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49. $\int e^x(\sin x + \cos x)dx = ?$

A. $e^x \sin x + c$

B. $e^x \cos x + c$

C. $-e^x \cos x + e^x \sin x + c$

D. $e^x\left(\sin^2 x + \sin x\right) + c$

Answer: A

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50. $\int e^x(1 + \tan x)\sec x dx =$

A. $e^x \cot x + c$

B. $e^x \tan x + c$

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

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

Answer: C

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51. $\int \frac{dx}{x - x^2} =$

A. $\log x - \log(1 - x) + c$

B. $\log\left(1 - x^2\right) + c$

C. $-\log x + \log(1 - x) + c$

D. $\log\left(x - x^2\right) + c$

Answer: A

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

A. $\log\left|\frac{x+2}{x+1}\right| + c$

B. $\log|x+1| + \log|x+2| + c$

C. $\log\left|\frac{x+1}{x+2}\right| + c$

D. $\log|x+1| + 2\log|x+2| + c$

Answer: C

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53. $\int \frac{x-1}{(x-3)(x-2)} dx =$

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

B. $\log\left|(x-3)^2\right| - \log|x-2| + c$

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

D. $\log\left|(x-3)^2\right| + \log|x-2| + c$

Answer: B

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54. $\int \frac{x}{(x-1)(x-2)}dx$

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

B. $\log a\left|\frac{x-1}{x-2}\right| + p$

C. $\frac{x-1}{x-2} + p$

D. $2\log\left|\frac{x-2}{x-1}\right| + p$

Answer: A

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55. The value of $\int \frac{dx}{x^4 + 5x^2 + 4}$ is

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

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

C. $\left(\frac{1}{3}\right)\tan^{-1} + \left(\frac{1}{6}\right)\tan^{-1}\left(\frac{x}{2}\right) + c$

D. $\left(\frac{1}{3}\right)\tan^{-1}x - \left(\frac{1}{6}\right)\tan^{-1}\left(\frac{x}{2}\right) + c$

Answer: D

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CRITICAL THINKING

1. $\int \frac{x^3 + 3x^2 + 3x + 1}{(x+1)^5} dx =$

A. $-\frac{1}{x+1} + c$

B. $\frac{1}{5}\log(x+1)+c$

C. $\log(x+1)+c$

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

Answer: A

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2. Evaluate: $\int\left(1+2x+3x^2+4x^3+\right)dx, (<|x|<1)$

A. $(1+x)^{-1}+c$

B. $(1-x)^{-1}+c$

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

D. $(1+x)^{-1}+x+c$

Answer: B

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

A. $-e^x+c$

B. e^x+c

C. $e^{-x}+c$

D. $-e^{-x}+c$

Answer: B

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4. $\int\frac{dx}{\sqrt{x+3}-\sqrt{x+2}}$

A. $\frac{2}{3}\log\left|\sqrt{x+3}-\sqrt{x+2}\right|+c$

B. $\log\left|\sqrt{x+3}-\sqrt{x+2}\right|+c$

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

D. $(x+3)^{\frac{3}{2}} + (x+2)^{\frac{2}{3}} + c$

Answer: C

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5. $\int \frac{x-1}{(x+1)^2} dx =$

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

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

C. $\frac{2}{x+1} - \log|x+1| + c$

D. $2\log|x+1| - \frac{1}{x+1} + c$

Answer: A

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6. $\int \frac{x^4+1}{x^2+1} dx$

A. $\frac{x^3}{3} - x + 2\tan^{-1}x + c$

B. 0

C. $\log\left|\frac{x^2+1}{x^4+1}\right| + c$

D. $\frac{x^3}{3} - x + \tan^{-1}x + c$

Answer: A

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7. $\int \frac{5\left(x^6+1\right)}{x^2+1}dx$

A. $5\left(x^7+x\right)\tan^{-1}x + c$

B. $x^5 - \frac{5}{3}x^3 + 5x + c$

C. $3x^4 - 5x^2 + 15x + c$

D. $5\tan^{-1}\left(x^2+1\right) + \log\left(x^2+1\right) + c$

Answer: B

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8. $\int 2^x.3^{x+1}.4^{x+2}dx =$

A. $\frac{(48)^x}{\log 48} + c$

B. $\frac{2^x 3^{x+1} 4^{x+2}}{\log 2 + \log 4 + \log 3} + c$

C. $\frac{(24)^{x+2}}{\log 24} + c$

D. $\frac{2^{x+1} 3^{x+2} 4^{x+3}}{\log 2 + \log 4 + \log 3} + c$

Answer: B

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9. If $f(x) = \frac{1}{1 - x}$, then $\int \left(f_o f_o f\right)(x)dx =$

A. $x + c$

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

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

D. $\frac{x^4}{4} + c$

Answer: B

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10. $\int 9^{\log_3(\sec x)} dx =$

A. $\sec x . \tan x + c$

B. $\cot x + c$

C. $\tan x + c$

D. $\sec^2 x + \tan^2 x + c$

Answer: C

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11. $\int\left(e^{a\log x}+e^{x\log a}\right)dx=$

A. $x^{a+1}+\frac{a^x}{\log a}+c$

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

C. $\frac{x^{a+1}}{a+1}+\frac{a^x}{\log a}+c$

D. $x^{a+1}+a^x\log a+c$

Answer: C

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

A. $2\cot 2x+c$

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

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

D. $-2\cot x+c$

Answer: B

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13. $\int \left(\sin^{-1}x + \cos(-1)x\right)dx =$

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

B. $x\left(\sin^{-1}x - \cos^{-1}x\right) + c$

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

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

Answer: C

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14. Evaluate: (i) $\int \sin^{-1}(\cos x)\,dx, \quad 0 \le x \le \pi$ (ii) `inttan^(-1){sqrt(((1-cos2x)/(1+cos2x)))}\ dx ,\ \ 0

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

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

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

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

Answer: C

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15. If $\int(\cos x - \sin x)dx = \sqrt{2}\sin(x + \alpha) + c$, then $\alpha =$

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

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

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

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

Answer: C

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16. $\int \sin 3x \cos 4x dx =$

A. $\frac{1}{2}\left(\sin x + \frac{1}{6}\sin 6x\right) + c$

B. $\frac{1}{2}\cos x - \frac{1}{6}\cos 6x + c$

C. $-\frac{1}{14}\cos 7x + \frac{1}{2}\cos x + c$

D. $4\cos^3 x - 3\sin x + c$

Answer: C

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17. $\int \frac{1}{\tan x + \cot x} dx =$

A. $\frac{\cos 2x}{4} + c$

B. $\frac{\sin 2x}{4} + c$

C. $-\frac{\sin 2x}{4} + c$

D. $-\frac{\cos 2x}{4} + c$

Answer: D

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18. $\int 2\sin x \cos x dx$ is equal to

A. $\cos 2x + c$

B. $\sin 2x + c$

C. $\cos^2 x + c$

D. $\sin^2 x + c$

Answer: D

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19. $\int \sqrt{1 + \sin 2x} dx$ is equal to

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

B. $\cos x - \sin x + c$

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

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

Answer: C

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

A. $\sin x + c$

B. $\cos x + c$

C. $x + c$

D. $x^2 + c$

Answer: C

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21. $4\int \frac{\sin^3 x + \cos^3 x}{\sin^2 2x} dx =$

A. $\sec x - \operatorname{cosec} x + c$

B. $\sec x + \operatorname{cosec} x + c$

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

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

Answer: A

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

A. $\sin x + c$

B. $\cos x + c$

C. $\tan x + c$

D. 0

Answer: C

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23. $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$

A. $2(\sin x + x\cos\alpha) + c$

B. $2(\sin x + \sin\alpha) + c$

C. $2(-\sin x + x\cos\alpha) + c$

D. $-2(\sin x + \sin\alpha) + c$

Answer: A

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24. $\int \sqrt{2 + \sqrt{2 + \sqrt{2 + 2\cos 8x}}} dx =$

A. $2\cos x + c$

B. $2\sec^2 x + c$

C. $2\sin x + c$

D. $\sqrt{2\sin x} + c$

Answer: C

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25. $\int \left(\sin^4 x - \cos^4 x\right) dx =$

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

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

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

D. $\frac{\sin^5 x}{5\cos x} + \frac{\cos^5 x}{\sin x} + c$

Answer: C

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26. $\frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x}$

A. $\sin^2 x + c$

B. $\cos^2 x + c$

C. $-\frac{1}{2}\sin 2x + c$

D. $\sin 2x + c$

Answer: C

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27. $\int \tan^{-1}\left(\sqrt{\frac{1 - \cos 2x}{1 + \cos 2x}}\right) dx$

A. $2x^2 + c$

B. $x^2 + c$

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

D. $2x + c$

Answer: C

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

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

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

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

D. $\frac{x^2}{5} + c$

Answer: C

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

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

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

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

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

Answer: A

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30. $\int \cos.\frac{x}{16}\cos.\frac{x}{8}\cos.\frac{x}{4}\cos.\frac{x}{2}\sin.\frac{x}{16}dx =$

A. $\frac{1}{256}\cos 16x + c$

B. $\frac{-1}{256}\cos 16x + c$

C. $\frac{1}{256}\sin 16x + c$

D. $\frac{-1}{4}\cos\frac{x}{2} + c$

Answer: D

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31. Evaluate : $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 x \cos^2 x} dx$

A. $\cot x + \cot^2 x + c$

B. $\tan x - \cot x - 3x + c$

C. $2\sin^5 x + 2\cos^5 x + c$

D. $\sin^3 x + 2\cos^3 x + c$

Answer: B

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32. $\int \frac{\cot x \tan x}{\sec^2 x - 1} dx =$

A. $\cot x - x + c$

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

C. $\cot x + x + c$

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

Answer: D

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33. $\int \frac{1 + \cos^2 x}{\sin^2 x} dx =$

A. $-\cot x - 2x + c$

B. $-2\cot x - 2x + c$

C. $-2\cot x - x + c$

D. $-2\cot x + x + c$

Answer: C

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34. $2\int \frac{1 + \cos 4x}{1 - \cos 4x} dx =$

A. $-\cot 2x - 2x + c$

B. $\cot 2x - 2x + c$

C. $-\cot 2x + 2x + c$

D. $\cot 2x + 2x + c$

Answer: A

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35. $\int \left(\frac{1 + \tan}{1 - \tan x}\right)^2 dx =$

A. $\frac{1}{3}\log[(\cos x - \sin x)]^3 + c$

B. $\tan\left(x - \frac{\pi}{4}\right) + c$

C. $\tan\left(\frac{\pi}{4} + x\right) - x + c$

D. $2\left(\frac{1 + \sec^2 x}{1 - \sec^2 x}\right) + c$

Answer: C

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36. $\int (\sec x + \tan x)^2 dx =$

A. $2(\sec x + \tan x) - x + c$

B. $\frac{1}{3}(\sec x + \tan x)^3 + c$

C. $\sec x(\sec x + \tan x) + c$

D. $2(\sec x + \tan x) + c$

Answer: A

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37. $\int \frac{\tan x}{\sec x + \tan x} dx =$

A. $\sec x + \tan x - x + c$

B. $\sec x - \tan x + x + c$

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

D. $-\sec x - \tan x + x + c$

Answer: B

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38. $\int \tan(3x - 5)\sec(3x - 5)dx$ is equal to (A) $\sec(3x - 5) + c$ (B) $\frac{1}{3}\sec(3x - 5) + c$ (C) $\tan(3x - 5) + c$ (D) none

A. $\sec(3x - 5) + c$

B. $\frac{1}{3}\sec(3x - 5) + c$

C. $\tan(3x - 5) + c$

D. $\frac{1}{3}\tan(3x - 5) + c$

Answer: B

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39. $\int \frac{f'(x)}{[f(x)]^2} dx =$

A. $-[f(x)]^{-1} + c$

B. $\log[f(x)] + c$

C. $e^{f(x)} + c$

D. $-\log[f(x)] + c$

Answer: A

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40. $\int \frac{10x^9 + 10^x \log_e 10}{10^x + x^{10}} dx =$

A. $-\frac{1}{2\left(10^x + x^{10}\right)^2} + c$

B. $\log\left(10^x + x^{10}\right) + c$

C. $\frac{1}{2\left(10^x + x^{10}\right)^2 + c}$

D. $\frac{1}{2}\log\left(10^x + x^{10}\right) + c$

Answer: B

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41. $\int \frac{x - 2}{x^2 - 4x + 3} dx =$

A. $\log\left(\sqrt{x^2 - 4x + 3}\right) + c$

B. $x\log(x - 3) - 2\log(x - 2) + c$

C. $\log[(x - 3)(x - 1)] + c$

D. $\log\left(x^2 - 4x + 3\right)^2 + c$

Answer: A

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42. $\int x^6 \sin\left(5x^7\right) dx = \frac{k}{5}\cos\left(5x^7\right) + c$,then k=

A. k=7

B. k=-7

C. $k = \frac{1}{7}$

D. $k = -\frac{1}{7}$

Answer: D

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43. If $\int \frac{\sin x}{\sin(x - \alpha)} dx = Ax + B\log\sin(x - \alpha) + C$, then value of (A, B) is

A. $x\sin\alpha - \sin\alpha\log|\sin(x + \alpha)| + c$

B. $x\cos\alpha + \sin\alpha\log|\sin(x - \alpha)| + c$

C. $x\cos\alpha - \sin\alpha\log|\sin(x + \alpha)| + c$

D. $x\sin\alpha + \sin\alpha\log|\sin(x - \alpha)| + c$

Answer: B

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44. $\int \frac{\cos(x+\alpha)}{\cos x} dx =$

A. $(\cos\alpha)x - \sin\alpha \log|\cos x| + c$

B. $(\cos\alpha)x - \sin\alpha \log|\sec x| + c$

C. $(\cos\alpha)x + \sin\alpha \log|\sec x| + c$

D. $(\cos\alpha) + \sin\alpha \log|\cos x| + c$

Answer: B

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45. $\int \frac{1}{\sqrt{1+\cos x}} dx =$

A. $\sqrt{2}\log\left|\sec\frac{x}{2} + \tan\frac{x}{2}\right| + c$

B. $\frac{1}{\sqrt{2}}\log\left|\sec\frac{x}{2} + \tan\frac{x}{2}\right| + c$

C. $\log\left|\sec\frac{x}{2} + \tan\frac{x}{2}\right| + c$

D. $2\log\left|\sec\frac{x}{2}+\tan\frac{x}{2}\right|+c$

Answer: A

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46. $\int\frac{dx}{4\cos^3 2x-3\cos 2x}=$

A. $\frac{1}{3}\log|\sec 6x+\tan 6x|+c$

B. $\frac{1}{6}\log|\sec 6x+\tan 6x|+c$

C. $\log|\sec 6x+\tan 6x|+c$

D. $3\log|\sec 6x+\tan 6x|+c$

Answer: B

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

A. $\log\left|\tan\left(\frac{x}{2}+\frac{\pi}{2}\right)\right|+c$

B. $\frac{1}{2}\log\left|\tan\left(\frac{x}{2}+\frac{\pi}{6}\right)\right|+c$

C. $\log\left|\cot\left(\frac{x}{2}+\frac{\pi}{6}\right)\right|+c$

D. $\frac{1}{2}\log\left|\cot\left(\frac{x}{2}+\frac{\pi}{6}\right)\right|+c$

Answer: B

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48. $\int\frac{\sin 2x}{\sin 5x.\sin 3x}dx=$

A. $\log|\sin 3x|-\log|\sin 5x|+c$

B. $\frac{1}{3}\log|\sin 3x|+\frac{1}{5}\log|\sin 5x|+c$

C. $\frac{1}{3}\log|\sin 3x|-\frac{1}{5}\log|\sin 5x|+c$

D. $\frac{\log|\sin 2x|}{\log|\sin 3x|+\log|\sin 5x|}+c$

Answer: C

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49. $\int \sqrt{\frac{1+x}{1-x}}dx = ?$

A. $-\sin^{-1}x - \sqrt{1-x^2} + c$

B. $\sin^{-1}x + \sqrt{1-x^2} + c$

C. $\sin^{-1}x - \sqrt{1-x^2} + c$

D. $-\sin^{-1}x - \sqrt{x^2-1} + c$

Answer: C

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50. $\int \frac{(x+1)(x+\log x)^2}{x}dx = ?$

A. $\frac{1}{3}(x+\log x) + c$

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

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

D. $\frac{1}{3}(1 + \log x)^3 + c$

Answer: C

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51. $\int \frac{dx}{x.\log x.\log(\log x)} =$

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

B. $\log|\log(\log x)| + c$

C. $[\log|\log x|]^2 + c$

D. $\frac{\log|\log x|}{x} + c$

Answer: B

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52. $\int \frac{1}{x^3}\left[\log x^x\right]^2 dx =$

A. $\frac{1}{x^3}(\log x) + x + c$

B. $\frac{1}{3}(\log x)^3 + c$

C. $3\log(\log x) + c$

D. $x^3(\log x)^3 + c$

Answer: B

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53. If $\frac{dI}{dy} = 3^{\cos y} \cdot \sin y$, then I is equal to

A. $\sin y + c$

B. $3^{\cos y} + c$

C. $\frac{-3^{\cos y}}{\log 3} + c$

D. $3^{\sin y} + c$

Answer: C

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54. $\int a^{a^x} . a^x dx =$

A. $\frac{a^{a^x}}{(\log a)^2} + c$

B. $a^{a^x}(\log a)^2 + c$

C. $\frac{a^{a^x}}{\log a} + c$

D. $a^{a^x} \log a + c$

Answer: A

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55. $\int e^{-x} \operatorname{cosec}^2\left(2e^{-x} + 5\right) dx$

A. $\frac{1}{2}\cot\left(2e^{-x} + 5\right) + c$

B. $-\frac{1}{2}\cot\left(2e^{-x}+5\right)+c$

C. $2\cot\left(2e^{-x}+5\right)+c$

D. $-2\cot\left(2e^{-x}+5\right)+c$

Answer: A

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56. $\int \frac{dx}{1+e^{x}}$

A. $\log\left|1+e^{x}\right|+c$

B. $-\log\left|1+e^{-x}\right|+c$

C. $-\log\left|1-e^{-x}\right|+c$

D. $\log\left|e^{-x}+e^{-2x}\right|+c$

Answer: B

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57. $\int \frac{1}{\left(e^{2x}+e^{-2x}\right)^2}dx =$

A. $\frac{-1}{4\left(e^{4x}+1\right)}+c$

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

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

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

Answer: A

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58. Evaluate the following integrals:

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

A. $\frac{1}{1+\log x}+c$

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

C. $\frac{x}{1+\log x}+c$

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

Answer: C

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59. $\frac{e^x(1+x)}{\sin\left(xe^x\right)}$

A. $\log\left|\cot\left(\frac{xe^x}{2}\right)\right|+c$

B. $\sin\left(xe^x\right)+c$

C. $\log\left|\tan\left(\frac{xe^x}{2}\right)\right|+c$

D. $-\cos\left(xe^x\right)+c$

Answer: C

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60. Evaluate: $\int \frac{\operatorname{cosec} x}{\frac{\log \tan x}{2}} dx$

A. $\log \left| \log \left(\tan \frac{x}{2} \right) \right| + c$

B. $2\log \left| \log \left(\tan \frac{x}{2} \right) \right| + c$

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

D. $2\log \left| \tan \frac{x}{2} \right| + c$

Answer: A

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

A. $\frac{1}{6} \left[\tan^{-1} \left(x^3 \right) \right]^2 + c$

B. $\frac{1}{6} \tan^{-1} \left(x^3 \right) + c$

C. $\frac{1}{6} \left[\tan^{-1} \left(1 + x^6 \right) \right]^2 + c$

D. $\tan^{-1}\left(\frac{x^3}{6}\right)+c$

Answer: A

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62. $\int \frac{\tan^4\sqrt{x}\sec^2\sqrt{x}}{\sqrt{x}}dx$

A. $2\tan^5\sqrt{x}+c$

B. $\frac{1}{2}\tan^5\sqrt{x}+c$

C. $\frac{2}{5}\tan^5\sqrt{x}+c$

D. $\frac{1}{5}\tan^5\sqrt{x}+c$

Answer: C

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63. $\int e^x \tan^2\left(e^x\right) dx =$

A. $\tan\left(e^x\right) - x + c$

B. $e^x\left[\tan\left(e^x\right) - 1\right] + c$

C. $\sec\left(e^x\right) + c$

D. $\tan\left(e^x\right) - e^x + c$

Answer: D

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

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

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

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

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

Answer: A

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65. $\int \frac{\left(x^4-x\right)^{\frac{1}{4}}}{x^5}dx$

A. $\frac{4}{15}\left(1-\frac{1}{x^3}\right)^{\frac{5}{4}}+c$

B. $\frac{4}{5}\left(1-\frac{1}{x^3}\right)^{\frac{5}{4}}+c$

C. $\frac{4}{15}\left(1+\frac{1}{x^3}\right)^{\frac{5}{4}}+c$

D. $\frac{4}{5}\left(1+\frac{1}{x^3}\right)^{\frac{5}{4}}+c$

Answer: A

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66. What is $\int \frac{dx}{x\left(x^7+1\right)}$ equal to?

A. $\log\left|\frac{x^7}{x^7+1}\right|+c$

B. $\frac{1}{7}\log\left|\frac{x^7}{x^7+1}\right|+c$

C. $\log\left|\frac{x^7+1}{x^7}\right|+c$

D. $\frac{1}{7}\log\left|\frac{x^7+1}{x^7}\right|+c$

Answer: B

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67. Evaluate: $\int \frac{1}{x\left(x^n+1\right)}dx$ (ii) $\int \frac{1}{x\left(x^5+1\right)}dx$

A. $\log\left|\frac{x^n}{x^n+1}\right|+c$

B. $\frac{1}{n}\log\left|\frac{x^n}{x^n+1}\right|+c$

C. $\frac{1}{2n}\log\left|\frac{x^n}{x^n+1}\right|+c$

D. $\frac{1}{2n}\log\left|\frac{x^n+1}{x^n}\right|+c$

Answer: B

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68. $\frac{1}{\cos^2 x(1-\tan x)^2}$

A. $\frac{1}{\tan x-1}+c$

B. $\frac{1}{1-\tan x}+c$

C. $-\frac{1}{3(1-\tan x)^3}+c$

D. $\frac{1}{2(1-\tan x)}+c$

Answer: B

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

A. $-\frac{\sqrt{1+x^2}}{x}+c$

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

C. $-\frac{\sqrt{1-x^2}}{x}+c$

D. $-\frac{\sqrt{x^2-1}}{x}+c$

Answer: A

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70. The value of $\int \frac{x^3}{\sqrt{1+x^4}}dx$ is

A. $\left(1+x^4\right)^{\frac{1}{2}}+c$

B. $-\left(1+x^4\right)^{\frac{1}{2}}+c$

C. $\frac{1}{2}\left(1+x^4\right)^{\frac{1}{2}}+c$

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

Answer: C

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71. $\int \frac{\sin 2x dx}{\sin^2 x+2\cos^2 x}=$

A. $\frac{1}{2}\log\left|1+\cos^2 x\right|+c$

B. $2\log\left|1+\cos^2 x\right|+c$

C. $\frac{1}{2}\log|1+\cos 2x|+c$

D. $-\log\left|1+\cos^2 x\right|+c$

Answer: D

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72. $\int \frac{\cos 2x}{(\sin x + \cos x)^2} dx$ is equal to

A. $\log\left|\sqrt{\cos x + \sin x}\right| + c$

B. $\log|\cos x - \sin x| + c$

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

D. $-\frac{1}{\cos x + \sin x} + c$

Answer: C

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73. $\int \frac{\sin x \cos x}{3\sin^2 x + 5\cos^2 x} dx =$

A. $\frac{1}{4}\log\left|3\sin^2 x + 5\cos^2 x\right| + c$

B. $-\frac{1}{4}\log\left|3\sin^2 x + 5\cos^2 x\right| + c$

C. $\frac{1}{4}\log\left|3\sin^2 x - 5\cos^2 x\right| + c$

D. $-\frac{1}{4}\log\left|3\sin^2 x - 5\cos^2 x\right| + c$

Answer: B

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74. $\int \frac{\cos x + x\sin x}{x^2 + x\cos x} dx = \ldots.$

A. $\log\left|\frac{\sin x}{1 + \cos x}\right| + c$

B. $\log\left|\frac{\sin x}{x + \cos x}\right| + c$

C. $\log\left|\frac{x\sin x}{x + \cos x}\right| + c$

D. $\log\left|\frac{x}{x + \cos x}\right| + c$

Answer: D

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

A. $\frac{1}{2}\left[\log\left(x+\sqrt{1+x^2}\right]^2+c\right.$

B. $\log\left(x+\sqrt{1+x^2}\right)^2+c$

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

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

Answer: A

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76. $\int x\left(x^x\right)^x(2\log x+1)dx =$

A. $\left(x^x\right)^x+c$

B. $\log(x)^x+c$

C. x^x+c

D. $2\left(x^x\right)^x + c$

Answer: A

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77. $\int \sqrt{1 + 2\tan x(\sec x + \tan x)}dx =$

A. $-\log|1 - \sin x| + c$

B. $\log|\sec x + \tan x| + c$

C. $\log|\sec x(\operatorname{cosec} x - \cot x)| + c$

D. $\frac{\sec^2 x + \tan^2 x}{2\sqrt{1 + 2\tan x(\sec x + \tan x)}} + c$

Answer: A

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78. $\int \frac{dx}{x\sqrt{1 - (\log x)^2}} =$

A. $\cos^{-1}(\log x) + c$

B. $x\log\left(1 - x^2\right) + c$

C. $\sin^{-1}(\log x) + c$

D. $\frac{1}{2}\cos^{-1}(\log x) + c$

Answer: C

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79. $\int \frac{\sin x}{\sqrt{4 - \cos^2 x}} dx =$

A. $\sin^{-1}\left(\frac{\cos x}{2}\right) + c$

B. $\frac{1}{2}\sin^{-1}\left(\frac{\cos x}{2}\right) + c$

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

D. $-\sin^{-1}\left(\frac{\cos x}{2}\right) + c$

Answer: D

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

A. $\sin^{-1}(\tan x) + c$

B. $\tan x + c$

C. $\cos^{-1}(\tan x) + c$

D. $\frac{\sin x}{\sqrt{\cos x}} + c$

Answer: A

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81. The value of $\int \frac{2dx}{\sqrt{1 - 4x^2}}$ is

A. $\tan^{-1}(2x) + c$

B. $\cos^{-1}(2x) + c$

C. $\cot^{-1}(2x) + c$

D. $\sin^{-1}(2x) + c$

Answer: D

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82. $\int \frac{dx}{\sqrt{2 - 3x - x^2}} =$

A. $\tan^{-1}\left(\frac{2x + 3}{\sqrt{17}}\right) + c$

B. $\sec^{-1}\left(\frac{2x + 3}{\sqrt{17}}\right) + c$

C. $\sin^{-1}\left(\frac{2x + 3}{\sqrt{17}}\right) + c$

D. $\cos^{-1}\left(\frac{2x + 3}{\sqrt{17}}\right) + c$

Answer: C

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83. Evaluate: $\int \frac{\cos x}{\sqrt{4 - \sin^2 x}}\, dx$

A. $-2\sin^{-1}\left(\frac{1}{2}\sin x\right) + c$

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

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

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

Answer: C

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84. $\int \frac{3x^2}{\sqrt{9 - 16x^6}} dx$

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

B. $\frac{1}{3}\sin^{-1}\left(\frac{4x^3}{3}\right) + c$

C. $\frac{1}{4}\sin^{-1}\left(x^3\right)+c$

D. $\frac{1}{3}\sin^{-1}\left(x^3\right)+c$

Answer: A

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85. $\int\sqrt{\frac{a-x}{a+x}}dx$

A. $a\sin^{-1}\left(\frac{x}{a}\right)+\sqrt{a^2-x^2}+c$

B. $a\sin^{-1}\left(\frac{x}{a}\right)+\sqrt{a^2+x^2}+c$

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

D. $a\sin^{-1}\left(\frac{x}{a}\right)-\sqrt{a^2+x^2}+c$

Answer: A

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86. If $\int \frac{2^x}{\sqrt{1-4^x}} dx = k.\sin^{-1}\left(2^x\right) + c$, then : $k =$

A. $\log 2$

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

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

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

Answer: D

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87. $\int \frac{\sqrt{x}}{1+x} dx =$

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

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

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

D. $\sqrt{1+x} + c$

Answer: B

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88. $\int \frac{e^{\log\left(1+\frac{1}{x^2}\right)}}{x^2+\frac{1}{x^2}}dx =$

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

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

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

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

Answer: A

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89. $\int \frac{xdx}{x^4 + x^2 + 1}$

A. $\frac{1}{\sqrt{2}}\tan^{-1}\left(\frac{x^4 + x^2 + 1}{\sqrt{2}}\right) + c$

B. $\left(\frac{x^2 + 1}{3}\right)\log\left|x^4 + x^2 + 1\right| + c$

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

D. $\tan^{-1}(x)\log\left|\frac{x^4 + 1}{x^2}\right| + c$

Answer: C

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90. $\int \frac{1}{1 + \sin^2 x} dx =$

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

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

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

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

Answer: A

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91. $\int \frac{1}{1+\cos^2 x}dx =$

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

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

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

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

Answer: C

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92. $\int \frac{\sin x}{3 + 4\cos^2 x} dx = \ldots\ldots$

A. $\log\left(3 + 4\cos^2 x\right) + c$

B. $\frac{-1}{2\sqrt{3}} \tan^{-1}\left(\frac{\cos x}{\sqrt{3}}\right) + c$

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

D. $\frac{1}{2\sqrt{3}} \tan^{-1}\left(\frac{2\cos x}{\sqrt{3}}\right) + c$

Answer: C

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

A. $\frac{a^2}{b^2} \log\left|a\sin^2 x + b\cos^2 x\right| + c$

B. $\frac{1}{ab} \tan^{-1}\left(\frac{a}{b}\tan x\right) + c$

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

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

Answer: B

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94. $\int\frac{dx}{\left(4\sin^2x+5\cos^2x\right)}=?$

A. $\frac{1}{\sqrt{5}}\tan^{-1}\left(\frac{2\tan x}{\sqrt{5}}\right)+c$

B. $\frac{1}{\sqrt{5}}\tan^{-1}\left(\frac{\tan x}{\sqrt{5}}\right)+c$

C. $\frac{1}{2\sqrt{5}}\tan^{-1}\left(\frac{2\tan x}{\sqrt{5}}\right)+c$

D. $\frac{1}{2\sqrt{5}}\tan^{-1}\left(\frac{\tan x}{\sqrt{5}}\right)+c$

Answer: C

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95. $\int \frac{dx}{2\sin^2 x - 3\cos^2 x + 7} =$

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

B. $\frac{1}{6}\tan^{-1}\left(\frac{3\tan x}{2}\right) + c$

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

D. $\frac{1}{6}\tan^{-1}\left(\frac{\tan x}{2}\right) + c$

Answer: B

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96. Evaluate $\int \frac{dx}{(2 + \cos x)}$.

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

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

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

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

Answer: B

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97. Evaluate the following integrals:

$$\int\frac{dx}{(2\sin x+\cos x+3)}$$

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

B. $\cot x+\frac{1}{2}\operatorname{cosec}x+c$

C. $\frac{1}{3}\log|2\sin x+\cos x+3|+c$

D. $\log|2\sin x+\cos x+3|+c$

Answer: A

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98. The value of $\int \frac{dx}{x\sqrt{x^4 - 1}}$ is

A. $\frac{1}{2}\sec^{-1}x^2 + c$

B. $\log x\sqrt{x^4 - 1} + c$

C. $x\log\sqrt{x^4 - 1} + c$

D. $\log\sqrt{x^4 - 1} + c$

Answer: A

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99. $\int \frac{x^2 - 1}{\left(x^2 + 1\right)\sqrt{x^4 + 1}}\, dx$

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

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

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

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

Answer: B

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

A. $\log\left|\tan x+\sqrt{\tan^2 x+4}\right|+c$

B. $\frac{1}{2}\log\left|\tan x+\sqrt{\tan^2 x+4}\right|+c$

C. $\log\left|\tan x+\frac{1}{2}\sqrt{\tan^2 x+4}\right|+c$

D. $\log\left|\tan x-\sqrt{\tan^2+4}\right|+c$

Answer: A

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101. $\int \sqrt{x^2 - 8x + 7}dx =$

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

B. $\frac{1}{2}(x - 4)\sqrt{x^2 - 8x + 7} - 3\sqrt{2}\log\left|x - 4 + \sqrt{x^2 - 8x + 7}\right| + c$

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

D. $\frac{1}{2}(x - 4)\sqrt{x^2 - 8x + 7} + 3\sqrt{2}\log\left|x - 4 + \sqrt{x^2 - 8x + 7}\right| + c$

Answer: C

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102. $\int \frac{x}{\sqrt{x^4 - 4}}dx =$

A. $\sin^{-1}\left(\frac{x^2}{2}\right)+c$

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

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

D. $\frac{1}{2}\log\left|x^2+\sqrt{x^4-4}\right|+c$

Answer: D

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103. $\int \frac{e^x}{\sqrt{e^{2x}+4e^x+13}}dx =$

A. $\log\left|e^x+2+\sqrt{e^{2x}+4e^x+13}\right|+c$

B. $\log\left|e^{2x}+4+\sqrt{e^{2x}+4e^x+13}\right|+c$

C. $\log\left|e^x+2+\sqrt{e^{2x}+2e^x+13}\right|+c$

D. $\log\left|e^x+4+\sqrt{e^{2x}+e^x+13}\right|+c$

Answer: A

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104. $\int \frac{1}{\sqrt{\cos^2 + \cot^2 x}} dx =$

A. $-\log\left(\cos x + \sqrt{1 - \cos^2 x}\right) + c$

B. $-\log\left(\cos x + \sqrt{1 + \cos^2 x}\right) + c$

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

D. $\log\left(\sqrt{\operatorname{cosec}^2 x + \cot^2 x}\right) + c$

Answer: B

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

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

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

C. $\frac{1}{2}\log\left|\frac{3x-1}{2(x+1)}\right|+c$

D. $\log\left|\frac{3x-1}{2(x+1)}\right|+c$

Answer: A

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106. $\int\frac{dx}{x\left[(\log x)^2+4\log x-1\right]}=$

A. $\frac{1}{2}\sqrt{5}\log\left|\frac{\log x+2-\sqrt{5}}{\log x+2+\sqrt{5}}\right|+c$

B. $\frac{1}{\sqrt{5}}\log\left|\frac{\log x+2-\sqrt{5}}{\log x+2+\sqrt{5}}\right|+c$

C. $\frac{1}{2}\sqrt{5}\log\left|\frac{\log x+2+\sqrt{5}}{\log x+2-\sqrt{5}}\right|+c$

D. $\frac{1}{\sqrt{5}}\log\left|\frac{\log x+2+\sqrt{5}}{\log x+2-\sqrt{5}}\right|+c$

Answer: A

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107. Evaluate: $\int \frac{1}{\left(x^2-1\right)\sqrt{x^2+1}}\,dx$

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

B. $\frac{1}{2\sqrt{2}}\log\left|\frac{\sqrt{1+x^2}-\sqrt{2}}{\sqrt{1+x^2}+\sqrt{2}}\right|+c$

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

D. $\frac{1}{2\sqrt{2}}\log\left|\frac{\sqrt{1+x^2}+\sqrt{2}}{\sqrt{1+x^2}-\sqrt{2}}\right|+c$

Answer: C

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108. If $\int \frac{(2x+1)}{x^4+2x^3+x^2-1}dx = A\log\left|\frac{x^2+x+1}{x^2+x-1}\right| + c$, then

A. A=1

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

C. A=-1

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

Answer: D

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109. $\int \frac{1}{\sin x\sqrt{\sin x.\cos x}}dx =$

A. $\sqrt{\tan x} + c$

B. $-\sqrt{\cot x} + c$

C. $-2\sqrt{\cot x} + c$

D. $2\sqrt{\tan x} + c$

Answer: C

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110. $\int \sin^3 x . \sqrt{\cos x} dx =$

A. $\frac{2}{7}\left(\sqrt{\cos x}\right)^7 - \frac{2}{3}\left(\sqrt{\cos x}\right)^3 + c$

B. $\frac{2}{5}\left(\sqrt{\cos x}\right)^5 - \frac{2}{3}\left(\sqrt{\cos x}\right)^3 + c$

C. $3\sin^2 x\sqrt{\cos x} + c$

D. $-\sin^2 x\sqrt{\cos x} + c$

Answer: A

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111. $\int \frac{dx}{\sqrt{x} + \sqrt[3]{x}}$

A. $\sqrt[3]{x} + \sqrt[6]{x} + \log\left|x^6\right| + c$

B. $2\sqrt{x} - 3\sqrt[3]{x} + 6\sqrt[6]{x} - 6\log\left|\sqrt[6]{x} + 1\right| + c$

C. $\log\left|\sqrt{x} + \sqrt[3]{x}\right| + c$

D. $2\sqrt{x} - \sqrt[3]{x} + 6\sqrt[6]{x} - 6\log\left|\sqrt[6]{x} + 1\right| + c$

Answer: B

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112. $\int \frac{x^5}{\sqrt{1+x^3}} dx =$

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

B. $\frac{2}{9}\sqrt{\left(1+x^3\right)\left(x^3+4\right)} + c$

C. $\frac{2}{9}\sqrt{1+x^3}\left(x^3-2\right) + c$

D. $\frac{2}{9}\sqrt{\left(1+x^3\right)\left(x^2-2\right)} + c$

Answer: C

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113. $\int \sec^6 x dx$

A. $\tan x + \frac{1}{3}\tan^3 x + \frac{1}{5}\tan^5 x + c$

B. $\tan x + \frac{2}{3}\tan^3 x + \frac{1}{5}\tan^5 x + c$

C. $\tan x + \frac{2}{3}\tan^3 x + \frac{2}{5}\tan^5 x + c$

D. $\tan x + \frac{1}{3}\tan^3 x + \frac{2}{5}\tan^5 x + c$

Answer: B

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114. $\int \sec^{\frac{2}{3}} x \operatorname{cosec}^{\frac{4}{3}} x dx =$

A. $3(\tan x)^{\frac{1}{3}} + c$

B. $3(\cot x)^{\frac{-1}{3}} + c$

C. $-3(\tan x)^{\frac{-1}{3}} + c$

D. $-3(\cot x)^{\frac{-1}{3}} + c$

Answer: C

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115. If $\int \tan^4 x dx = A\tan^3 x + B\tan x + f(x)$, then

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

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

C. $B = 2$

D. $f(x) = x + c$

Answer: D

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116. $\int \frac{\sin^3 2x}{\cos^5 2x} dx =$

A. $\tan^4 x + c$

B. $\tan 4x + c$

C. $\tan^4 2x + x + c$

D. $\frac{1}{8}\tan^4 2x + c$

Answer: D

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117. $\int \log x dx = ?$

A. $x\log\left(\frac{x}{e}\right) + c$

B. $x\log x + c$

C. $\frac{\log x}{x} + c$

D. $x\log\left(\frac{e}{x}\right) + c$

Answer: A

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118. If $\int xe^{2x}dx$ is equal to $e^{2x}f(x) + c$, where c is constant of integration, then f(x) is

A. $(3x - 1)/4$

B. $(2x + 1)/2$

C. $(2x - 1)/4$

D. $(x - 4)/6$

Answer: C

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119. Evaluate the following integrals:

$\int x^2e^{3x}dx$

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

B. $\frac{1}{3}x^2e^{3x} + \frac{2}{9}e^{3x} + c$

C. $\frac{1}{3}x^2e^{3x} - \frac{2}{9}xe^{3x} + \frac{2}{27}e^{3x} + c$

D. $\frac{1}{3}x^2e^{3x} + \frac{2}{9}xe^{3x} + c$

Answer: C

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120. $\int x^3 \log x dx =$

A. $\frac{x^4 \log x}{4} + c$

B. $\frac{1}{16}\left(4x^4 \log x - x^4\right) + c$

C. $\frac{1}{8}\left(x^4 \log x - 4x^2\right) + c$

D. $\frac{1}{16}\left(4x^4 \log x + x^4\right) + c$

Answer: B

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121. $\int \frac{\log x}{x^3} dx =$

A. $\frac{1}{4x^2}(2\log x - 1) + c$

B. $-\frac{1}{4x^2}(2\log x + 1) + c$

C. $\frac{1}{4x^2}(2\log x + 1) + c$

D. $\frac{1}{4x^2}(1 - 2\log x) + c$

Answer: B

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122. Evaluate : $\int x^n \log x dx$.

A. $\frac{x^{n+1}}{n+1}\left(\log x + \frac{1}{n+1}\right) + c$

B. $\frac{x^{n+1}}{n+1}\left(\log x + \frac{2}{n+1}\right) + c$

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

D. $\frac{x^{n+1}}{n+1}\left(\log x - \frac{1}{n+1}\right) + c$

Answer: D

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123. $\int [f(x) + xf'(x)]dx =$

A. $x.\ f(x) + c$

B. $e^x.\ f(x) + c$

C. $\frac{x}{f(x)} + c$

D. $e^x[f(x) + f'(x)] + c$

Answer: A

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124. The value of $\int [f(x)g''(x) - f''(x)g(x)]dx$ is equal to

A. $f(x)g'(x) - f'(x)g(x) + c$

B. $f(x)g'(x) + f(x)g(x) + c$

C. $f'(x)g(x) - f(x)g'(x) + c$

D. none of these

Answer: A

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125. If $I_n = \int x^n e^x dx$, then $I_5 + 5I_4 =$

A. $4x^4 + e^x + c$

B. $5x^4 e^x + c$

C. $x^5 e^x + c$

D. $x^3 e^x + c$

Answer: C

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126. $\int \tan^{-1} x dx = \ldots. + C$

A. $x\tan^{-1} x + \frac{1}{2}\log\left|1 + x^2\right| + c$

B. $x\tan A^{-1} x - \frac{1}{2}\log\left|1 + x^2\right| + c$

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

D. $x\tan^{-1} - \log\left|1 + x^2\right| + c$

Answer: B

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

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

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

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

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

Answer: B

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128. If $I = \int \tan^{-1}\left(\frac{2x}{1 - x^2}\right)dx$, then , $I - 2x\tan^{-1}x =$

A. $\log\left(1 + x^2\right) + c$

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

C. $-\log\left(1 + x^2\right) + c$

D. $-\log\left(1 - x^2\right) + c$

Answer: C

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129. $\int x^3\tan^{-1}x dx$

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

B. $\frac{1}{2}\left[\left(x^4 - 1\right)\tan^{-1}x - \frac{x^3}{3} + x\right] + c$

C. $\frac{1}{4}\left[\left(x^4 - 1\right)\tan^{-1}x - \frac{x^3}{3} + x\right] + c$

D. $\frac{1}{8}\left[\left(x^4 - 1\right)\tan^{-1}x - \frac{x^3}{3} + x\right] + c$

Answer: C

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130. $If \int x\log\left(1 + \frac{1}{x}\right)dx = f(x)\log(x + 1) + g(x)x^2 + Ax + C,$ then $f(x) = \frac{1}{2}x^2$

(b) $g(x) = \log x\, A = 1$ (d) none of these

A. $L = 1$

B. $f(x) = \frac{x^2}{2}$

C. $g(x) = \log x$

D. $f(x) = \frac{x^2 - 1}{2}$

Answer: D

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131. If $\int \log\left(x^2 + x\right)dx = x\log\left(x^2 + x\right) + A$, then A=

A. $2x + \log|x + 1| + \text{constant}$

B. $2x - \log|x + 1| + \text{constant}$

C. constant

D. $-2x + \log|x + 1| + c$

Answer: D

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132. $\int \sin^{-1} x dx$

A. $\frac{1}{\sqrt{1 - x^2}} + c$

B. $x\sin^{-1}x - \sqrt{1 - x^2} + c$

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

D. $x\sin^{-1}x + \sqrt{1 - x^2} + c$

Answer: D

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133. $\int \sin\sqrt{x}dx = ?$

A. $2\sin\sqrt{x} - 2\sqrt{x}\cos\sqrt{x} + c$

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

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

D. $\cos\sqrt{x}(\sin x)^{\frac{3}{2}} + c$

Answer: A

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134. $\int \sqrt{x} e^{\sqrt{x}} dx =$

A. $2\sqrt{x} - e^{\sqrt{x}} - 4\sqrt{x} - e^{\sqrt{x}} + c$

B. $\left(2x - 4\sqrt{x} + 4\right)e^{\sqrt{x}+c}$

C. $\left(2x + 4\sqrt{x} + 4\right)e^{\sqrt{x}} + c$

D. $\left(1 - 4\sqrt{x}\right)e^{\sqrt{x}} + c$

Answer: B

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135. $\int x^5 . e^{x^2} dx =$

A. $\frac{1}{2}x^4 . e^{x^2} - x^2 . e^{x^2} + e^{x^2} + c$

B. $\frac{1}{2}x^4 . e^{x^2} + x^2 . e^{x^2} + e^{x^2} + c$

C. $\frac{1}{4}x^4 . e^{x^2} - x^2 . e^{x^2} - e^{x^2} + c$

D. $\frac{1}{4}x^4 . e^{x^2} + x^2 . e^{x^2} + e^{x^2} + c$

Answer: A

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136. $\int \sin(\log x)dx =$

A. $\frac{1}{2}x[\cos(\log x) - \sin(\log x)] + c$

B. $\cos(\log x) - x + c$

C. $\frac{1}{2}x[\sin(\log x) - \cos(\log x)] + c$

D. $-\cos(\log x) + c$

Answer: C

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137. $\int \sin x \log(\sec x + \tan x)dx =$

A. $x + \cos x \log(\sec x + \tan x) + c$

B. $x - \cos x \log(\sec x) + c$

C. $x - \cos x \log(\sec x + \tan x) + c$

D. $x + \cos x \log(\sec x) + c$

Answer: C

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138. Evaluate: $\int \sin^{-1}\left(3x - 4x^3\right) dx$

A. $x\sin^{-1}x + \sqrt{1 - x^2} + c$

B. $x\sin^{-1} - \sqrt{1 - x^2} + c$

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

D. $3\left(x\sin^{-1}x + \sqrt{1 - x^2}\right) + c$

Answer: D

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139. Evaluate: $\int \frac{\sin^{-1}x}{\left(1-x^2\right)^{3\backslash 2}}\,dx$

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

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

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

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

Answer: A

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

A. $\frac{x+\tan^{-1}x}{\sqrt{1+x^2}}+c$

B. $\frac{x-\tan^{-1}x}{\sqrt{1+x^2}}+c$

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

D. $\frac{1 - \tan^{-1}x}{\sqrt{1+x^2}} + c$

Answer: B

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141. $\int \sec^3\theta d\theta =$

A. $\frac{1}{2}(\sec\theta\tan\theta + \log|\sec\theta + \tan\theta|) + c$

B. $\frac{1}{2}(\sec\theta + \tan\theta + \log|\sec\theta + \tan\theta|) + c$

C. $\frac{1}{4}(\sec\theta\tan\theta + \log|\sec\theta\tan\theta|) + c$

D. $\sec\theta\tan\theta + \log|\sec\theta\tan\theta| + c$

Answer: A

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

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

B. $xe^{-x} + c$

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

D. $\left(x - \frac{1}{x} \right) e^x + c$

Answer: A

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143. The value of $\int e^x \left(x^5 + 5x^4 + 1 \right) dx$ is

A. $e^x . x^5 + c$

B. $e^x . x^5 + e^x + c$

C. $e^{x+1} . x^5 + c$

D. $5x^4.e^x + c$

Answer: B

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144. $\int e^x[\tan x - \log(\cos x)]dx =$

A. $e^x \log(\sec x) + c$

B. $e^x \log(\operatorname{cosec} x) + c$

C. $e^x \log(\cos x) + c$

D. $e^x \log(\sin x) + c$

Answer: A

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145. $\int e^x\left(1 + \tan x + \tan^2 x\right)dx =$

A. $e^x \sin x + c$

B. $e^x \cos x + c$

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

D. $e^x \sec x + c$

Answer: C

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146. $\int e^x \left(1 - \cot x + \cot^2 x\right) dx =$

A. $e^x \cot x + c$

B. $e^x \operatorname{cosec} x + c$

C. $-e^x \cot x + c$

D. $-e^x \operatorname{cosec} x + c$

Answer: C

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147. $\int \frac{xe^x}{(x+1)^2} dx =$

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

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

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

D. $\frac{-e^x}{(x+1)^3} + c$

Answer: A

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148. $\frac{x+3}{(x+4)^2} e^x dx$ is equal to

A. $\frac{1}{(x+4)^2} + c$

B. $\frac{e^x}{(x+4)^2} + c$

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

D. $\frac{e^x}{x+3}+c$

Answer: C

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

A. $e^x\left(\frac{x-1}{x+1}\right)+c$

B. $e^x\left(\frac{x+1}{x-1}\right)+c$

C. $e^x(x+1)(x-1)+c$

D. $\frac{e^x}{(x+1)^2}+c$

Answer: A

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150. Evaluate $\int e^x \frac{2 + \sin 2x}{1 + \cos 2x} dx$

A. $e^x \cot x + c$

B. $-e^x \cot x + c$

C. $-e^x \tan x + c$

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

Answer: D

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151. $\int e^x \left(\frac{1 - \sin x}{1 - \cos x} \right) dx =$

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

B. $e^x \cot x + c$

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

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

Answer: A

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152. Evaluate: $\int e^{2x}(-\sin x + 2\cos x)\,dx$

A. $e^{2x}\sin x + c$

B. $-e^{2x}\sin x + c$

C. $-e^{2x}\cos x + c$

D. $e^{2x}\cos x + c$

Answer: D

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153. $\int \log x(\log x + 2)dx =$

A. $x(\log x)^2 + c$

B. $x(1+\log x)^2+c$

C. $x\left[1+(\log x)^2\right]+c$

D. $x(1+\log x)+c$

Answer: A

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

A. $\frac{1}{\log x}+c$

B. $\frac{x}{\log x}+c$

C. $\frac{x}{(\log x)^2}+c$

D. $\frac{\log x}{x}+c$

Answer: B

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155. Evaluate the following integrals:

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

A. $\frac{1}{1+\log x} + c$

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

C. $\frac{x}{1+\log x} + c$

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

Answer: C

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156. $\int \left\{ \log(\log x) + \frac{1}{(\log x)^2} \right\} dx = x\{f(x) - g(x)\} + C$, then

A. $f(x) = \log(\log x), g(x) = \frac{1}{\log x}$

B. $f(x) = \log x, g(x) = \frac{1}{\log x}$

C. $f(x) = \frac{1}{\log x}, g(x) = \log(\log x)$

D. $f(x) = \frac{1}{x\log x}, g(x) = \frac{1}{\log x}$

Answer: A

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157. $\int \frac{1}{x^2 - x^3} dx =$

A. $\log\left|\frac{1-x}{x}\right| - \frac{1}{x} + c$

B. $\log\left|\frac{1-x}{x}\right| + \frac{1}{x} + c$

C. $\log\left|\frac{x}{1-x}\right| + \frac{1}{x} + c$

D. $\log\left|\frac{x}{1-x}\right| - \frac{1}{x} + c$

Answer: D

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158. Evaluate: $\int \frac{x^2 + x - 1}{x^2 + x - 6} dx$

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

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

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

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

Answer: B

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159. $\int \frac{x}{x^4 - 1} dx =$

A. $\frac{1}{4}\log\left|\frac{x^2 - 1}{x^2 + 1}\right| + c$

B. $\frac{1}{4}\log\left|\frac{x^2 + 1}{x^2 - 1}\right| + c$

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

D. $\frac{1}{2}\log\left|\frac{x^2+1}{x^2-1}\right|+c$

Answer: A

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160. $\int \frac{x^2}{\left(x^2+2\right)\left(x^2+3\right)}dx =$

A. $-\sqrt{2}\tan^{-1}x+\sqrt{3}\tan^{-1}x+c$

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

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

D. $\sqrt{2}\tan^{-1}x+\sqrt{3}\tan^{-1}x+c$

Answer: B

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161. $\int \frac{dx}{\left(x^2 - 1\right)(1 - 2x)} =$

A. $-\frac{1}{2}\log|1 - x| - \frac{1}{6}\log|1 + x| + \frac{2}{3}\log|1 - 2x| + c$

B. $\frac{1}{2}\log|1 - x| - \frac{1}{6}\log|1 + x| + \frac{2}{3}\log|1 - 2x| + c$

C. $-\frac{1}{2}\log|1 - x| + \frac{1}{6}\log|1 + x| + \frac{2}{3}\log|1 - 2x| + c$

D. $\frac{1}{2}\log|1 - x| + \frac{1}{6}\log|1 + x| + \frac{2}{3}\log|1 - 2x| + c$

Answer: A

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162. $\int \frac{1}{x - x^3} dx =$

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

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

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

D. $\frac{1}{2}\log\left|\frac{x^2}{1-x^2}\right| + c$

Answer: D

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163. $\int \frac{e^x}{\left(1+e^x\right)\left(2+e^x\right)} dx$

A. $\log\left|\left(1+e^x\right)\left(2+e^x\right)\right| + c$

B. $\log\left|\frac{1+e^x}{2+e^x}\right| + c$

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

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

Answer: B

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

A. $\log\left|e^x - 1\right| - \log\left|e^x + 2\right| + c$

B. $\frac{1}{2}\log\left|e^x - 1\right| - \frac{1}{3}\log\left|e^x + 2\right| + c$

C. $\frac{1}{3}\log\left|e^x - 1\right| - \frac{1}{3}\log\left|e^x + 2\right| + c$

D. $\frac{1}{3}\log\left|e^x - 1\right| + \frac{1}{3}\log\left|e^x + 2\right| + c$

Answer: C

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165. $\int \frac{a}{b + ce^x} dx =$

A. $\frac{a}{b}\log\left|\frac{e^x}{b + ce^x}\right| + c$

B. $\frac{a}{b}\log\left|\frac{b + ce^x}{e^x}\right| + c$

C. $\frac{b}{a}\log\left|\frac{e^x}{b + ce^x}\right| + c$

D. $\frac{b}{a}\log\left|\frac{b+ce^x}{e^x}\right|+c$

Answer: A

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

A. $\log|(1+\sin x)(2+\sin x)|+c$

B. $\log\left|\frac{2+\sin x}{1+\sin x}\right|+c$

C. $\log\left|\frac{1+\sin x}{2+\sin x}\right|+c$

D. $\log\left|\frac{2+\cos x}{1+\sin x}\right|+c$

Answer: C

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167. $\int \frac{x^3 - 1}{1 + \sin x} dx =$

A. $x - \log|x| + \frac{1}{2}\log\left|x^2 + 1\right| + \tan^{-1}x + c$

B. $x - \log|x| + \log\left|\sqrt{x^2 + 1}\right| - \tan^{-1}x + c$

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

D. None of these

Answer: B

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168. $\int \frac{2x + 7}{(x - 4)^2} dx =$

A. $\log|x - 4| - \frac{15}{x - 4} + c$

B. $2\log|x - 4| - \frac{15}{x - 4} + c$

C. $2\log|x - 4| + \frac{15}{x - 4} + c$

D. $2\log|x - 4| - \frac{7}{x - 4} + c$

Answer: B

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

A. $\frac{1}{5}\log|x-2| - \frac{1}{x-2} + \frac{2}{5}\log|x+3| + c$

B. $\frac{3}{5}\log|x-2| - \frac{1}{x-2} + \frac{2}{5}\log|x+3| + c$

C. $\frac{3}{5}\log|x-2| + \frac{1}{x-2} + \frac{2}{5}\log|x+3| + c$

D. $\frac{1}{5}\log|x-2| + \frac{1}{x-2} + \frac{2}{5}\log|x+3| + c$

Answer: B

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170. $\int \frac{1}{(x-1)\left(x^2+1\right)}dx =$

A. $\frac{1}{2}\log(x-1) - \frac{1}{4}\log\left(x^2+1\right) - \frac{1}{2}\tan^{-1}x + c$

B. $\frac{1}{2}\log(x-1)+\frac{1}{4}\log\left(x^2+1\right)-\frac{1}{2}\tan^{-1}x+c$

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

D. None of these

Answer: A

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171. $\int\frac{dx}{1+x+x^2+x^3}dx=$

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

B. $\log\left|\sqrt{1+x}\right|-\log\left|\sqrt{1+x^2}\right|+\tan^{-1}x+c$

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

D. $\log\left|\sqrt{1+x}\right|+\tan^{-1}x+\log\left|\sqrt{1+x^2}\right|+c$

Answer: A

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172. $\int \frac{x^4}{(x-1)\left(x^2+1\right)} dx =$

A. $\frac{x(x+2)}{2} + \frac{\log|x-1|}{2} - \frac{\log\left|x^2+1\right|}{4} - \frac{\tan^{-1}x}{2} + c$

B. $\frac{x(x+2)}{2} + \frac{\log|x-1|}{2} + \frac{\log\left|x^2+1\right|}{4} - \frac{\tan^{-1}x}{2} + c$

C. $\frac{x(x+2)}{2} + \frac{\log|x-1|}{2} + \frac{\log\left|x^2+1\right|}{4} + \frac{\tan^{-1}x}{2} + c$

D. None of these

Answer: A

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173. If $\int \frac{1}{f(x)} dx = \log[f(x)]^2 + c$, then $f(x) =$

A. $2x + \alpha$

B. $\frac{x}{2} + \alpha$

C. $x + \alpha$

D. $x^2 + \alpha$

Answer: B

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174. If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}, a = 7^x, b = 7^{7^x}, c = 7^{7^{7^x}}$, then $\int |A| dx$, where $|A|$ is the determinant of the matrix A, equals

A. $\frac{7^{7^x}}{(\log 7)^3} + c$

B. $\frac{7^{7^{7^x}}}{\log 7} + c$

C. $7^{7^{7^x}} . (\log 7)^3 + c$

D. $\frac{7^{7^{7^x}}}{(\log 7)^3} + c$

Answer: D

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175. For which of the following functions, the substitution $x^2 = t$ is applicable

A. $\int x^6 \tan^{-1} x^3 dx$

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

C. $\int x^3 \cos x^2 dx$

D. None of these

Answer: C

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176. $\int \tan^{-1}\sqrt{\frac{1-x}{1+x}} dx =$

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

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

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

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

Answer: B

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177. $\int x.\sin x.\sec^3 x dx =$

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

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

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

D. $\frac{1}{2}\left(\sec^2 x + \tan x\right) + c$

Answer: B

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178. Evaluate: $\int \log(x+1)dx$

A. $(x+1)\log(x+1) - x + c$

B. $(x+1)\log(x+1) + x + c$

C. $(x-1)\log(x+1) - x + c$

D. $(x-1)\log(x+1) + x + c$

Answer: A

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179. $\int \frac{1}{\cos x(1+\cos x)}dx =$

A. $\log|\sec x + \tan x| + 2\tan\frac{x}{2} + c$

B. $\log|\sec x + \tan x| - 2\tan\frac{x}{2} + c$

C. $\log|\sec x + \tan x| + \tan\frac{x}{2} + c$

D. $\log|\sec x + \tan x| - \tan\frac{x}{2} + c$

Answer: D

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COMPETITIVE THINKING

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

A. $\frac{1}{3}\left[x^{3/2} - (x-2)^{3/2}\right] + c$

B. $\frac{2}{3}\left[x^{3/2} - (x-2)^{3/2}\right] + c$

C. $\frac{1}{3}\left[(x-2)^{3/2} - x^{3/2}\right] + c$

D. $\frac{2}{3}\left[(x-2)^{3/2} - x^{3/2}\right] + c$

Answer: A

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2. If $\int f(x)dx = f(x)$, then $\int \{f(x)\}^2 dx$ is equal to

A. $\frac{1}{2}[f(x)]^2$

B. $[f(x)]^3$

C. $\frac{[f(x)]^3}{3}$

D. $[f(x)]^2$

Answer: A

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3. $\int e^{x\log a}.\, e^x dx$ is equal to

A. $(ae)^x + c$

B. $\frac{(ae)^x}{\log(ae)} + c$

C. $\frac{e^x}{1 + \log a} + c$

D. None of these

Answer: B

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4. $\int \frac{e^{5\log x} - e^{4\log x}}{e^{3\log x} - e^{2\log x}} dx =$

A. $e.3^{-3x} + c$

B. $e^3 \log x + c$

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

D. None of these

Answer: C

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5. The value of $\int \frac{e^{6\log x} - e^{5\log x}}{e^{4\log x} - e^{3\log x}} dx$ is equal to

A. $\frac{x^3}{3} + c$

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

C. 0

D. $\frac{3}{x^3} + c$

Answer: A

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6. $\int x^{51}\left(\tan^{-1}x + \cot^{-1}x\right)dx =$

A. $\frac{x^{52}}{52}\left(\tan^{-1}x + \cot^{-1}x\right) + c$

B. $\frac{x^{52}}{52}\left(\tan^{-1}x + \cot^{-1}x\right) + c$

C. $\frac{(\pi x)^{52}}{104} + \frac{\pi}{2} + c$

D. $\frac{x^{52}}{52} + \frac{\pi}{2} + c$

Answer: A

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7. $\int \frac{x+1}{x^{\frac{1}{2}}}dx =$

A. $-x^{\frac{3}{2}} + x^{\frac{1}{2}} + c$

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

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

D. $x^{\frac{3}{2}} + x^{\frac{1}{2}} + c$

Answer: C

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8. $\int \frac{x + 1\sqrt{1 - x^2}}{x\sqrt{1 - x^2}} dx =$

A. $\sin^{-1}x - \frac{1}{x^2} + c$

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

C. $\log x + \sqrt{1 - x^2} + c$

D. $\log x \cdot \sqrt{1 - x^2} + c$

Answer: B

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9. $\int \frac{\sin^2 x}{1+\cos x} dx =$

A. $\sin x + C$

B. $x + \sin x + C$

C. $\cos x + C$

D. $x - \sin x + C$

Answer: D

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10. $\int \frac{1}{1-\sin x} dx$

A. $x + \cos x + c$

B. $1 + \sin x + c$

C. $\sec x - \tan x + c$

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

Answer: D

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11. $\int \frac{1}{\sin^2 x \cos^2 x} dx = ?$

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

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

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

D. None of these

Answer: C

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12. $\int \frac{1}{\sin x \cos^2 x} dx =$

A. $\sec x + \log|\sec x + \tan x| + c$

B. $\sec x \tan x + c$

C. $\sec x + \log|\sec x - \tan x| + c$

D. $\sec x + \log|\operatorname{cosec} x - \cot x| + c$

Answer: D

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13. The value of $\int \frac{1}{1 + \cos 8x} dx$ is

A. $\frac{\tan 2x}{8} + c$

B. $\frac{\tan 8x}{8} + c$

C. $\frac{\tan 4x}{4} + c$

D. $\frac{\tan 4x}{8} + c$

Answer: D

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14. If $\int \frac{\sin 2x}{\sin 5x \sin 3x} dx$

$1 = \frac{1}{3}\log|\sin 3x| - \frac{1}{5}\log|f(x)| + c$, then $f(x)$

=_____.

A. $\sin 5x$

B. $\sin 4x$

C. $\sin 2x$

D. $\sin 6x$

Answer: A

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15. $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$

A. $2(\sin x + x\cos\theta) + c$

B. $2(\sin x - x\cos thet) + c$

C. $2(\sin x + 2x\cos\theta) + c$

D. $2(\sin x - 2x\cos\theta) + c$

Answer: A

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

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

B. $\frac{1}{2}\tan\frac{x}{2} - x + c$

C. $x - \frac{1}{2}\tan\frac{x}{2} + c$

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

Answer: D

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17. $\int \frac{x + \sin x}{1 - \cos x} dx =$

A. $x\tan\frac{x}{2} + \sec\frac{x}{2} + c$

B. $x\sec\frac{x}{2} + \tan\frac{x}{2} + c$

C. $x\sin\frac{x}{2} + \cos\frac{x}{2} + c$

D. $x\tan\frac{x}{2} + c$

Answer: D

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18. $\int (1 - \cos x).\ \text{cosec}^2 x dx =$

A. $-2\cot\left(\frac{x}{2}\right) + c$

B. $-\cot\left(\frac{x}{2}\right) + c$

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

D. $\tan\left(\frac{x}{2}\right) + c$

Answer: D

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19. $\int \sqrt{1 + \sin 2x} dx =$

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

B. $\sin x - \cos x + c$

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

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

Answer: D

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

A. $\frac{1}{4}\left(\cos\frac{x}{4} - \sin\frac{x}{4}\right) + c$

B. $4\left(\cos\frac{x}{4} - \sin\frac{x}{4}\right) + c$

C. $4\left(\sin\frac{x}{4} - \cos\frac{x}{4}\right) + c$

D. $4\left(\sin\frac{x}{4} + \cos\frac{x}{4}\right) + c$

Answer: C

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21. If $\int\sqrt{2}\sqrt{1+\sin x}dx = -4\cos(ax+b)+c$, then the value of (a,b) is

A. $\left(\frac{1}{2}, \frac{\pi}{4}\right)$

B. $\left(1, \frac{\pi}{2}\right)$

C. $(1, 1)$

D. None of these

Answer: A

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22. If $\int(\sin 2x - \cos 2x)dx = \frac{1}{\sqrt{2}}\sin(2x - a) + b$ then

A. $a = \frac{\pi}{4}, b = 0$

B. $a = -\frac{\pi}{4}, b = 0$

C. $a = \frac{5\pi}{4}$, b= any constant

D. $a = -\frac{5\pi}{4}$, b=any constant

Answer: D

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23. If $\int \frac{1}{1 + \sin x}dx = \tan\left(\frac{x}{2} + a\right) + b$ then

A. $a = \frac{\pi}{4}, b = 3$

B. $a = -\frac{\pi}{4}, b = 3$

C. $a = \frac{\pi}{4}$, b=arbitrary constant

D. $a = -\frac{\pi}{4}$, b=arbitrary constant

Answer: D

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24. $\int \frac{\cos\alpha}{\sin x \cos(x-\alpha)} dx =$ _____ $+ c$, where $0 \le x \le \alpha \le \frac{\pi}{2}$ and α is constant.

A. $-\log|\cot x + \tan\alpha|$

B. $\log|\cot x + \tan\alpha|$

C. $-\log|\tan x + \cot\alpha|$

D. $\log|\tan x + \cot\alpha|$

Answer: A

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25. $\int \sec^5 x \tan x dx = ?$

A. $\frac{1}{4}\sec^4 x + c$

B. $4\sec^4 x + c$

C. $\frac{\sec^3}{3} + c$

D. $3\sec^3 x + c$

Answer: A

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26. Let $I_n = \int \tan^n x dx, n > 1.$ $I_4 \_ I_6 = a\tan^5 x + bx^5 + C$, where C is a constant of integration , then the ordered pair (a , b) is equal to

A. $\left(-\frac{1}{5}, 0\right)$

B. $\left(-\frac{1}{5}, 1\right)$

C. $\left(\frac{1}{5}, 0\right)$

D. $\left(\frac{1}{5}, -1\right)$

Answer: C

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27. For $n \geq 2$, if $I_n = \int \sec^n x dx$, then $I_4 - \frac{2}{3} I_2 =$

A. $\sec^2 x \tan x + C$

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

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

D. $\frac{1}{3}\log|\sec c + \tan x| + C$

Answer: B

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28. $\int \frac{\cos\left(\log_e x\right)}{x} dx$

A. $\frac{\sin(\log x)}{\cos x} + c$

B. $\sin(\log x) + c$

C. $\frac{\sin(\log x)}{x} + c$

D. none of these

Answer: B

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29. $\int xe^{x^2 \log 2} e^{x^2} dx = \_\_\_\_\_ + c$

A. $\frac{(2e)^{x^2}}{\log(2e)}$

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

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

D. $\frac{2^{x^2}\log 2 . e^{x^2}}{\log 2}$

Answer: C

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30. Evaluate : $\int \frac{2x\tan^{-1}x}{1+x^4} \backslash dx$

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

B. $\frac{1}{2}\left[\tan^{-1}x^2\right]^2 + c$

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

D. None of these

Answer: B

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31. $\int \left(e^x + e^{-x}\right)^2 \cdot \left(e^x - e^{-x}\right) dx$ is equal to

A. $e^x + c$

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

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

D. $\frac{1}{3}\left(e^x + e^{-x}\right)^3 + c$

Answer: D

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32. Evaluate: $\int \frac{1 + \tan x}{x + \log\sec x} dx$

A. $\log(x + \log\sec x) + c$

B. $-\log(x + \log\sec x) + c$

C. $\log(x - \log\sec x) + c$

D. None of these

Answer: A

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33. To find the value of $\int \frac{1+\log x}{x} dx$, the proper substitution is

A. $\log x = t$

B. $1 + \log x = t$

C. $\frac{1}{x} = t$

D. None of these

Answer: B

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

A. $\frac{1}{b^2} \log\left(a^2 + b^2 \sin^2 x\right) + c$

B. $\frac{1}{b} \log\left(a^2 + b^2 \sin^2 x\right) + c$

C. $\log\left(a^2 + b^2 \sin^2 x\right) + c$

D. $b^2\log\left(a^2+b^2\sin^2x\right)+c$

Answer: A

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35. $\int x^2\sec x^3dx=$

A. $\log\left(\sec x^3+\tan x^3\right)+c$

B. $3\left(\sec x^3+\tan x^3\right)+c$

C. $\frac{1}{3}\log\left(\sec x^3+\tan x^3\right)+c$

D. $\log(\sec x+\tan x)+c$

Answer: C

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36. $\int\frac{e^x(1+x)}{\cos^2\left(xe^x\right)}dx=$

A. $\tan\left(xe^x\right) + c$

B. $\sec\left(xe^x\right)\tan\left(xe^x\right) + c$

C. $-\tan\left(xe^x\right) + c$

D. None of these

Answer: A

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

A. $\log\left|x - e^{-x}\right| + c$

B. $\log\left|x + e^{-x}\right| + c$

C. $\log\left|1 + xe^x\right| + c$

D. $\left(1 + xe^x\right)^2 + c$

Answer: C

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38. $\int\left(\frac{\left(x^2+2\right)a^{\left(x+\tan^{-1}x\right)}}{x^2+1}\right)dx =$

A. $\log a.\ a^{x+\tan^{-1}x}+c$

B. $\frac{\left(x+\tan^{-1}x\right)}{\log a}+c$

C. $\frac{a^{x+\tan^{-1}x}}{\log a}+c$

D. $\log a.\left(x+\tan^{-1}x\right)+c$

Answer: C

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39. The primitive of $\frac{1}{4\sqrt{x}+x}$ w.r.t.x is

A. $\frac{1}{2}\log\left(\sqrt{x}+4\right)+c$

B. $2\log\left(\sqrt{x}+4\right)+c$

C. $\log\left(\sqrt{x}+4\right)+c$

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

Answer: B

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40. $\int \frac{x\sin x}{x\cos x - \sin x - 1}dx = \_\_\_\_\_ + c$

A. $-\log|x\sin x - \cos x - 1|$

B. $\log|x\sin x - \cos x - 1|$

C. $-\log|x\cos x - \sin x - 1|$

D. $\log|x\cos x - \sin x - 1|$

Answer: C

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41. The value of $\int \frac{dx}{\sin x \cos x + 3\cos^2 x}$ is

A. $\log|\cos x + 3| + c$

B. $\log|\sin x + 3| + c$

C. $\log|\tan x + 3| + c$

D. $\log|\tan x - 3| + c$

Answer: C

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42. $\int \frac{\cos x}{\sqrt{1 + \sin x}} dx$ is equal to

A. $\sin\left(\frac{x}{2}\right) - \cos\left(\frac{x}{2}\right) + c$

B. $\sin\left(\frac{x}{2}\right) + \cos\left(\frac{x}{2}\right) + c$

C. $2\left[\sin\left(\frac{x}{2}\right) - \cos\left(\frac{x}{2}\right)\right] + c$

D. $2\left[\sin\left(\frac{x}{2}\right)+\cos\left(\frac{x}{2}\right)\right]+c$

Answer: D

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43. The value of $\int \frac{\text{cosec } x}{\cos^2\left(1+\text{logtan}.\frac{x}{2}\right)}dx$ is

A. $\sin^2\left(1+\text{logtan}\frac{x}{2}\right)+c$

B. $\tan\left(1+\text{logtan}\frac{x}{2}\right)+c$

C. $\sec^2\left(1+\text{logtan}\frac{x}{2}\right)+c$

D. $-\tan\left(1+\text{logtan}\frac{x}{2}\right)+c$

Answer: B

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44. $\int \frac{\log\sqrt{x}}{3x} dx$

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

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

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

D. $\frac{1}{3}(\log x)^2 + c$

Answer: A

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45. $\int \left\{\frac{\log x - 1}{1 + (\log x)^2}\right\}^2$ dx is equal to

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

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

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

D. $\frac{-x}{(1 + (\log x))^2} + c$

Answer: C

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

A. $2\sqrt{\sec x} + c$

B. $2\sqrt{\tan x} + c$

C. $\frac{2}{\sqrt{\tan x}} + c$

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

Answer: B

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47. $\int \frac{x^3 \sin\left[\tan^{-1}\left(x^4\right)\right]}{1 + x^8} dx =$

A. $\frac{1}{4}\cos\left[\tan^{-1}\left(x^4\right)\right]+c$

B. $\frac{1}{4}\sin\left[\tan^{-1}\left(x^4\right)\right]+c$

C. $\frac{-1}{4}\cos\left[\tan^{-1}\left(x^4\right)\right]+c$

D. $\frac{1}{4}\sec\left[\tan^{-1}\left(x^4\right)\right]+c$

Answer: C

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48. $\int \cos ec^4 x dx$

A. $\cot x+\frac{\cot^3 x}{3}+c$

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

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

D. $-\tan x-\frac{\tan^3 x}{3}+c$

Answer: C

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49. $\int (x+1)(x+2)^7(x+3)dx$ is equal to

A. $\frac{(x+2)^{10}}{10} - \frac{(x+2)^8}{8} + c$

B. $\frac{(x+1)^2}{2} - \frac{(x+2)^8}{8} - \frac{(x+3)^2}{2} + c$

C. $\frac{(x+2)^{10}}{10} + c$

D. $\frac{(x+1)^2}{2} + \frac{(x+2)^8}{8} + \frac{(x+3)^2}{2} + c$

Answer: A

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50. $\int \sec x dx = ?$

A. $\log \tan\left(\frac{\pi}{4} + \frac{x}{2}\right) + c$

B. $-\log(\sec x - \tan x) + c$

C. $\log(\sec x - \tan x) + c$

D. None of these

Answer: B

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51. $\int\left(\frac{1+\tan x}{1-\tan x}\right)dx$

A. $\log\sec\left(\frac{\pi}{4}-x\right)+c$

B. $\log\cos\left(\frac{\pi}{4}+x\right)+c$

C. $\log\sin\left(\frac{\pi}{4}+x\right)+c$

D. None of these

Answer: C

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52. $\int \frac{dx}{\sin x + \cos x} =$

A. $\log\tan\left(\frac{\pi}{8} + \frac{x}{2}\right) + c$

B. $\log\tan\left(\frac{\pi}{8} - \frac{x}{2}\right) + c$

C. $\frac{1}{\sqrt{2}}\log\tan\left(\frac{\pi}{8} + \frac{x}{2}\right) + c$

D. None of these

Answer: C

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53. $\int \frac{1}{\sqrt{1 + \sin x}} dx =$

A. $2\sqrt{2}\log\tan\left(\frac{\pi}{8} + \frac{x}{4}\right) + c$

B. $\frac{1}{\sqrt{2}}\log\tan\left(\frac{\pi}{8} + \frac{x}{4}\right) + c$

C. $\sqrt{2}\log\tan\left(\frac{\pi}{8} + \frac{x}{4}\right) + c$

D. $\frac{1}{2\sqrt{2}}\log\tan\left(\frac{\pi}{8}+\frac{x}{4}\right)+c$

Answer: C

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54. The value of $\sqrt{2}\int\frac{\sin x}{\sin\left(x-\frac{\pi}{4}\right)}dx$, is

A. $x-\log\left|\sin\left(x-\frac{\pi}{4}\right)\right|+c$

B. $x+\log\left|\sin\left(x-\frac{\pi}{4}\right)\right|+c$

C. $x-\log\left|\cos\left(x-\frac{\pi}{4}\right)\right|+c$

D. $x+\log\left|\cos\left(x-\frac{\pi}{4}\right)\right|+c$

Answer: B

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55. $\int \{1 + 2\tan x(\tan x + \sec x)\}^{1/2} dx$ is equal to

A. $\log(\sec x + \tan x) + c$

B. $\log(\sec x + \tan x)^{1/2} + c$

C. $\log\sec x(\sec x + \tan x) + c$

D. None of these

Answer: C

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56. $\int \frac{dx}{e^x + e^{-x}}$

A. $\tan^{-1}\left(e^{-x}\right) + c$

B. $\tan^{-1}\left(e^{x}\right) + c$

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

D. $\log\left(e^{x} + e^{-x}\right) + c$

Answer: B

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57. $\int \frac{1}{1+e^x} dx$ is equal to

A. $\log_e\left(\frac{e^x+1}{e^x}\right)+c$

B. $\log_e\left(\frac{e^x-1}{e^x}\right)+c$

C. $\log_e\left(\frac{e^x}{e^x+1}\right)+c$

D. $\log_e\left(\frac{e^x}{e^x-1}\right)+c$

Answer: C

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

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

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

C. $\frac{1}{1 + e^{-x}} + c$

D. $\frac{1}{e^{-x} - 1} + c$

Answer: B

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59. $\int \frac{x}{1 + x^4} dx$

A. $\frac{1}{2}\cot^{-1}\left(x^2\right) + c$

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

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

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

Answer: B

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60. If $\int \frac{1}{(1+x)\sqrt{x}} dx = f(x) + A$, where A is any arbitrary constant, then the function f(x) is

A. $2\tan^{-1}x$

B. $2\tan^{-1}\sqrt{x}$

C. $2\cot^{-1}\sqrt{x}$

D. $\log_e(1+x)$

Answer: B

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61. $\int \frac{x^2}{1+x^6} dx$ is equal to

A. $\tan^{-1}x^2 + c$

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

C. $\frac{1}{3}\tan^{-1}x^3 + c$

D. $\frac{1}{2}\tan^{-1}x^2 + c$

Answer: C

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62. $\int \frac{x^3}{\left(1 + x^8\right)} dx$

A. $4\tan^{-1}\left(x^3\right) + c$

B. $\frac{1}{4}\tan^{-1}\left(x^4\right) + c$

C. $x + 4\tan^{-1}\left(x^4\right) + c$

D. $x^2 + \frac{1}{4}\tan^{-1}\left(x^4\right) + c$

Answer: B

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63. $\int \frac{1}{16x^2+9}dx$ is equal to

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

B. $\frac{1}{12}\tan^{-1}\left(\frac{4x}{3}\right)+c$

C. $\frac{1}{3}\tan^{-1}\left(\frac{4x}{3}\right)+c$

D. $\frac{1}{6}\tan^{-1}\left(\frac{4x}{3}\right)+c$

Answer: B

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64. If $\int \frac{1}{\sqrt{9-16x^2}}dx = \alpha\sin^{-1}(\beta x)+c$, then $\alpha+\frac{1}{\beta}=$

A. 1

B. $\frac{7}{12}$

C. $\frac{19}{12}$

D. $\frac{9}{12}$

Answer: A

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65. if $\int \frac{dx}{\sqrt{16 - 9x^2}} = A\sin^{-1}(Bx) + C$, then A+B=

A. $\frac{9}{4}$

B. $\frac{19}{4}$

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

D. $\frac{13}{12}$

Answer: D

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66. $\int \frac{dx}{\sqrt{x^{10} - x^2}} =$ _____ $+ c, x > 1$

A. $\frac{1}{4}\log\left|\sqrt{x^{10}-x^2}+x^2\right|$

B. $\frac{1}{2}\log\left|x^{10}-x^2\right|$

C. $-\frac{1}{4}\sec^{-1}\left(x^4\right)$

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

Answer: D

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67. $\int \frac{\sin 2x}{\sin^4 x+\cos^4 x}dx$

A. $\cot^{-1}\left(\tan^2 x\right)+c$

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

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

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

Answer: B

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68. If $\int \frac{\sin 2x}{\sin^4 x + \cos^4 x} dx = \tan^{-1}[f(x)] + c$, then $f\left(\frac{\pi}{3}\right) =$

A. 1

B. 2

C. 3

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

Answer: C

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69. The integral

$$\int \frac{\sin^2 x \cos^2 x}{\left(\sin^5 x + \cos^3 x \sin^2 x + \sin^3 x \cos^2 x + \cos^5 x\right)^2} dx$$ is equal to

(where c is a constant of integration)

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

B. $\frac{1}{1+\cot^3 x}+c$

C. $\frac{-1}{1+\cot^3 x}+c$

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

Answer: A

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70. Evaluate: (i) $\int \frac{a^x}{\sqrt{1-a^{2x}}}dx$ (ii) $\int \frac{2x}{\sqrt{1-x^2-x^4}}dx$

A. $\frac{1}{\log a}\sin^{-1}a^x+c$

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

C. $\frac{1}{\log a}\cos^{-1}a^x+c$

D. $\cos^{-1}a^x+c$

Answer: A

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71. $\int \frac{1}{\sqrt{8 + 2x - x^2}} dx =$

A. $\frac{1}{3}\sin^{-1}\left(\frac{x - 1}{3}\right) + c$

B. $\sin^{-1}\left(\frac{x + 1}{3}\right) + c$

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

D. $\sin^{-1}\left(\frac{x - 1}{3}\right) + c$

Answer: D

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72. $\int \frac{1}{\sqrt{1 - 6x - 9x^2}} dx$ is equal to

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

B. $\sin^{-1}\left(\frac{3x+1}{6}\right)+c$

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

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

Answer: C

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73. If $I=\int\frac{dx}{\sqrt{(1-x)(x-2)}}$, then I is equal to

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

B. $\sin^{-1}(2x+5)+C$

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

D. $\sin^{-1}(5-2x)+C$

Answer: A

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74. If $\int\sqrt{\frac{x-5}{x-7}}dx = A\sqrt{x^2-12x+35}+\log\left|x-6+\sqrt{x^2-12x+35}\right|+C$, then

A. -1

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

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

D. 1

Answer: D

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75. $\int\sqrt{x^2+2x+5}dx$ is equal to

A. $\frac{1}{2}(x+1)\sqrt{x^2+2x+5}+2\log\left|x+1+\sqrt{x^2+2x+5}\right|+c$

B. $(x+1)\sqrt{x^2+2x+5}+2\log\left|x+1+\sqrt{x^2+2x+5}\right|+c$

C. $(x+1)\sqrt{x^2+2x+5}-2\log\left|x+1+\sqrt{x^2+2x+5}\right|+c$

D. $(x+1)\sqrt{x^2+2x+5}+\frac{1}{2}\log\left|x+1+\sqrt{x^2+2x+5}\right|+c$

Answer: A

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76. $\int \frac{\sec^8 x}{\operatorname{cosec} x}dx =$

A. $\frac{\sec^8 x}{8}+c$

B. $\frac{\sec^7 x}{7}+c$

C. $\frac{\sec^6 x}{6}+c$

D. $\frac{\sec^9 x}{9}+c$

Answer: B

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77. $\int \frac{dx}{5+4\cos x}$

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

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

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

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

Answer: C

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78. $\int\frac{1}{7+5\cos x}dx=$

A. $\frac{1}{\sqrt{6}}\tan^{-1}\left(\frac{1}{\sqrt{6}}\tan\frac{x}{2}\right)+c$

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

C. $\frac{1}{4}\tan^{-1}\left(\tan\frac{x}{2}\right)+c$

D. $\frac{1}{7}\tan^{-1}\left(\tan\frac{x}{2}\right)+c$

Answer: A

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79. $\int \frac{dx}{1 + 3\sin^2 x}$.

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

B. $\frac{1}{2}\tan^{-1}(2\tan x) + c$

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

D. None of these

Answer: B

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80. If $\int \frac{5\tan x}{\tan x - 2} dx = x + a \ \text{In}(\sin x - 2\cos x) + k$ then $a =$

A. -1

B. -2

C. 1

D. 2

Answer: D

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81. $\int \frac{\sin x}{\sin x - \cos x} dx =$

A. $\frac{1}{2}\log(\sin x - \cos x) + x + c$

B. $\frac{1}{2}[\log(\sin x - \cos x) + x] + c$

C. $\frac{1}{2}\log(\cos x - \sin x) + x + c$

D. $\frac{1}{2}[\log(\cos x - \sin x) + x] + c$

Answer: B

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82. $\frac{4e^x - 25}{2e^x - 5}$

A. A=5, B=3

B. A=5, B=-3

C. A=-5, B=3

D. A=-5, B=-3

Answer: B

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83. $\int \frac{dx}{\sin(x - a)\sin(x - b)}$

A. $\frac{1}{\sin(a - b)} \log \left| \frac{\sin(x - a)}{\sin(x - b)} \right| + c$

B. $-\frac{1}{\sin(a - b)} \log \left| \frac{\sin(x - a)}{\sin(x - b)} \right| + c$

C. $\log \sin(x - a)\sin(x - b) + c$

D. $\log \left| \frac{\sin(x - a)}{\sin(x - b)} \right| + c$

Answer: A

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84. $\int \sqrt{e^x - 1} dx$

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

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

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

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

Answer: A

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85. The value of the integral $\int \frac{dx}{\left(e^x + e^{-x}\right)}$ is

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

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

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

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

Answer: B

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86. $\int \frac{dx}{\sqrt{1-e^{2x}}}$ is equal to

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

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

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

D. None of these

Answer: A

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

A. $\frac{3}{2}\sin^{-1}x - \frac{1}{2}x\sqrt{1-x^2} + c$

B. $\frac{3}{2}\sin^{-1}x + \frac{1}{2}x\sqrt{1-x^2} + c$

C. $\frac{3}{2}\cos^{-1}x - \frac{1}{2}x\sqrt{1-x^2} + c$

D. $\frac{3}{2}\cos^{-1}x + \frac{1}{2}x\sqrt{1-x^2} + c$

Answer: A

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88. The integral $\int \frac{dx}{x^2\left(x^4+1\right)^{3/4}}$ equal

A. $\left(\frac{x^4+1}{x^4}\right)^{\frac{1}{4}}+c$

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

C. $-\left(x^4+1\right)^{\frac{1}{4}}+c$

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

Answer: D

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89. $\int \frac{2x^{12}+5x^9}{\left(x^5+x^3+1\right)^3}dx =$

A. $\frac{x^{10}}{2\left(x^5+x^3+1\right)^2}+C$

B. $\frac{x^5}{2\left(x^5+x^3+1\right)^2}+C$

C. $\frac{-x^{10}}{2\left(x^5+x^3+1\right)^2}+C$

D. $\frac{-x^5}{\left(x^5+x^3+1\right)^2}+C$

Answer: A

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90. The value of integral

$$\int \frac{1}{\left[(x-3)^3(x+2)^5\right]^{1/4}}dx \text{ is}$$

A. $\frac{4}{3}\left(\frac{x-1}{x+2}\right)^{1/4}+c$

B. $\frac{4}{3}\left(\frac{x+1}{x+2}\right)^{1/4}+c$

C. $\frac{4}{3}\left(\frac{x+1}{x-2}\right)^{1/4}+c$

D. $\frac{4}{3}\left(\frac{x-1}{x-2}\right)^{1/4}+c$

Answer: A

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91. The value of $\int \frac{(x-2)dx}{\left\{(x-2)^2(x+3)^7\right\}^{1/3}}$ is

A. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)^{4/3}+c$

B. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)^{3/4}+c$

C. $\frac{5}{12}\left(\frac{x-2}{x+3}\right)^{4/3}+c$

D. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)^{5/3}+c$

Answer: A

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92. If $I=\int \frac{\sin 2x}{(3+4\cos x)^3}dx$, then I=

A. $\frac{3\cos x+8}{(3+4\cos x)^2}+C$

B. $\frac{3+8\cos x}{16(3+4\cos x)^2}+C$

C. $\frac{3+\cos x}{(3+4\cos x)^2}+C$

D. $\frac{3 - 8\cos x}{16(3 + 4\cos x)^2} + C$

Answer: B

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93. $\int \frac{dx}{\cos x\sqrt{1 + \cos 2x + \sin 2x}} = \_\_\_\_\_ + c, \left(0 < x < \frac{\pi}{4}\right)$

A. $2 + \sqrt{\cot x}$

B. $\sqrt{\tan x + 1}$

C. $\sqrt{2 + 2\tan x}$

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

Answer: C

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94. $\int \frac{(\sin\theta + \cos\theta)}{\sqrt{\sin 2\theta}} d\theta =$

A. $\log\left|\cos\theta - \sin\theta + \sqrt{\sin 2\theta}\right| + c$

B. $\log\left|\sin\theta - \cos\theta + \sqrt{\sin 2\theta}\right| + c$

C. $\sin^{-1}(\sin\theta - \cos\theta) + c$

D. $\sin^{-1}(\sin\theta + \cos\theta) + c$

Answer: C

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95. $\int \frac{1}{\left(a^2 + x^2\right)^{3/2}} dx$ is equal to

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

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

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

D. None of these

Answer: B

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96. $\int \frac{1}{a + be^x} dx =$

A. $\frac{1}{b}\log\left|a + be^x\right| + c$

B. $-\frac{1}{b}\log\left|a + be^x\right| + c$

C. $-\frac{1}{b}\log\left|ae^x + 1\right| + c$

D. $\frac{1}{a}\log\left|\frac{e^x}{a + be^x}\right| + c$

Answer: D

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

A. $\frac{1}{e}\log\left|x^e + e^x\right| + c$

B. $e\log\left|x^e + e^x\right| + c$

C. $\frac{-1}{e}\log\left|x^e + e^x\right| + c$

D. $-e\log\left|x^e + e^x\right| + c$

Answer: A

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98. $\int\left(x^2+1\right)\sqrt{x+1}dx$ is equal to

A. $\frac{(x+1)^{7/2}}{7} - \frac{2(x+1)^{5/2}}{5} + \frac{2(x+1)^{3/2}}{3} + c$

B. $2\left[\frac{(x+1)^{7/2}}{7} - \frac{2(x+1)^{5/2}}{5} + \frac{2(x+1)^{3/2}}{3}\right] + c$

C. $\frac{(x+1)^{7/2}}{7} - \frac{2(x+1)^{5/2}}{5} + c$

D. $\frac{(x+1)^{7/2}}{7} - \frac{3(x+1)^{5/2}}{5} + 11(x+1)^{5/2} + c$

Answer: B

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99. $\int \frac{x^3 dx}{\left(x^2+1\right)^3}$ is equal to

A. $\frac{1}{4}\left[\frac{2x^2+1}{\left(x^2+1\right)^2}\right]+K$

B. $-\frac{1}{4}\left[\frac{2x^2+1}{\left(x^2+1\right)^2}\right]+K$

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

D. $-\frac{1}{3}\left[\frac{2x^2+1}{\left(x^2+1\right)^2}\right]+K$

Answer: B

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100. $\int \frac{x^2 - 1}{x^4 + 3x^2 + 1} dx (x > 0)$ is

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

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

C. $\log_e\left(\frac{x + \frac{1}{x} - 1}{x + \frac{1}{x} + 1}\right) + c$

D. $\log_e\left(\frac{x - \frac{1}{x} - 1}{x - \frac{1}{x} + 1}\right) + c$

Answer: A

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101. $\int \frac{2 - \sin x}{2 + \cos x} dx =$

A. $-\frac{4}{\sqrt{3}} \tan^{-1}\left(\frac{\tan(x/2)}{\sqrt{3}}\right) + \log(2 + \cos x) + c$

B. $\frac{4}{\sqrt{3}}\tan^{-1}\left(\frac{\tan(x/2)}{\sqrt{3}}\right) + \log(2 + \cos x) + c$

C. $\frac{4}{\sqrt{3}}\tan^{-1}\left(\frac{\tan(x/2)}{\sqrt{3}}\right) - \log(2 + \cos x) + c$

D. 0

Answer: B

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102. Let $\int \frac{x^2}{\sqrt{1-x}}dx = p\sqrt{(1-x)}\left(3x^2 + 4x + 8\right)$, then value of p is

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

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

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

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

Answer: A

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103. Let $f(x) = \int \frac{x^2}{\left(1+x^2\right)\left(1+\sqrt{1+x^2}\right)} dx$ and $f(0) = 0$ then $f(1)$ is

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

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

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

D. None of these

Answer: B

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104. If $I = \int \frac{e^x}{e^{4x}+e^{2e}+1} dx$. $J = \int \frac{e^{-x}}{e^{-4x}+e^{-2x}+1} dx$. Then for an arbitrary constant c, the value of $J - I$ equal to

A. $\frac{1}{2}\log\left|\frac{e^{4x}-e^{2x}+1}{e^{4x}+e^{2x}+1}\right| + C$

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

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

D. $\frac{1}{2}\log\left|\frac{e^{4x}+e^{2x}+1}{e^{4x}-e^{2x}+1}\right|+C$

Answer: C

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105. The integral $\int\frac{\sec^{2}x}{(\sec x+\tan x)^{\frac{9}{2}}}dx$ equals to (for some arbitrary constant K)

(A) $-\frac{1}{(\sec x+\tan x)^{\frac{11}{2}}}\left\{\frac{1}{11}-\frac{1}{7}(\sec x+\tan x)^{2}\right\}+K$

(B) $\frac{1}{(\sec x+\tan x)^{\frac{11}{2}}}\left\{\frac{1}{11}-\frac{1}{7}(\sec x+\tan x)^{2}\right\}+K$

(C) $-\frac{1}{(\sec x+\tan x)^{\frac{11}{2}}}\left\{\frac{1}{11}+\frac{1}{7}(\sec x+\tan x)^{2}\right\}+K$

(D) $\frac{1}{(\sec x+\tan x)^{\frac{11}{2}}}\left\{\frac{1}{11}+\frac{1}{7}(\sec x+\tan x)^{2}\right\}+K$

A. $\frac{-1}{(\sec x+\tan x)^{11/2}}\left\{\frac{1}{11}-\frac{1}{7}(\sec x+\tan x)^2\right\}+K$

B. $\frac{1}{(\sec x+\tan x)^{11/2}}\left\{\frac{1}{11}-\frac{1}{7}(\sec x+\tan x)^2\right\}+K$

C. $\frac{-1}{(\sec x+\tan x)^{11/2}}\left\{\frac{1}{11}+\frac{1}{7}(\sec x+\tan x)^2\right\}+K$

D. $\frac{1}{(\sec x+\tan x)^{11/2}}\left\{\frac{1}{11}+\frac{1}{7}(\sec x+\tan x)^2\right\}+K$

Answer: C

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106. If $f(x)=x$ and $g(x)=\sin x$, then

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

A. $-\cos x+c$

B. $\cos x+c$

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

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

Answer: C

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107. If $\int x\sin x dx = -x\cos x + A$, then A =

A. $\sin x$ + constant

B. $\cos x$ + constant

C. constant

D. None of these

Answer: A

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108. $\int \log_{10} x dx =$

A. $x\log_{10} x + c$

B. $x\left(\log_{10}x + \log_{10}e\right) + c$

C. $\log_{10}x + c$

D. $x\left(\log_{10}x - \log_{10}e\right) + c$

Answer: D

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

A. $\frac{1}{2}x^2\cos 2x + \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

B. $-\frac{1}{2}x^2\cos 2x + \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

C. $\frac{1}{2}x^2\cos 2x - \frac{1}{2}x\sin 2x + \frac{1}{4}\cos 2x + c$

D. None of these

Answer: B

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110. Evaluate the following integrals:

$\int x\sin^2 x dx$

A. $\frac{x^2}{4} + \frac{x}{4}\sin 2x + \frac{1}{8}\cos 2x + c$

B. $\frac{x^2}{4} - \frac{x}{4}\sin 2x + \frac{1}{8}\cos 2x + c$

C. $\frac{x^2}{4} + \frac{x}{4}\sin 2x - \frac{1}{8}\cos 2x + c$

D. $\frac{x^2}{4} - \frac{x}{4}\sin 2x - \frac{1}{8}\cos 2x + c$

Answer: D

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111. $\int x\cos^2 x dx =$

A. $\frac{x^2}{4} - \frac{1}{4}x\sin 2x - \frac{1}{8}\cos 2x + c$

B. $\frac{x^2}{4} + \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

C. $x^4 - \frac{1}{4}x\sin 2x + \frac{1}{8}\cos 2x + c$

D. $x^4 + \frac{1}{4}x\sin 2x - \frac{1}{8}\cos 2x + c$

Answer: B

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112. Which of the following is the primitive of $\cos^{-1}x$?

A. $x\cos^{-1}x - \sqrt{1 - x^2} + c$

B. $x\cos^{-1}x + \sqrt{1 - x^2} + c$

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

D. $-\frac{1}{\sqrt{1 - x^2} + c}$

Answer: A

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

A. $x\cos(\log x) + c$

B. $\sin(\log x) + c$

C. $\cos(\log x) + c$

D. $x\sin(\log x) + c$

Answer: D

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114. $\int \frac{(\sin x + \cos x)(2 - \sin 2x)}{\sin^2 2x} dx =$

A. $\frac{\sin x + \cos x}{\sin 2x} + c$

B. $\frac{\sin x - \cos x}{\sin 2x} + c$

C. $\frac{\sin x}{\sin x + \cos x} + c$

D. $\frac{\sin x}{\sin x - \cos x} + c$

Answer: B

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115. $\int e^{\sin x}(x\cos x - \sec x\tan x)dx = \_\_\_\_\_ + c, 0 < x < \frac{\pi}{2}$

A. $e^{\sin x}(x - \sec x)$

B. $e^{\sin x}(\sec x - x)$

C. $e^{\sin x}x\cos x$

D. $e^{\sin x}(x + \sec x)$

Answer: A

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116. If $\int e^{\sin x}\left(\frac{x\cos^3 x - \sin x}{\cos^2 x}\right)dx = e^{\sin x}f(x) + c,$

where c is constant of integration, then f(x)=`

A. $\sec x - x$

B. $x - \sec x$

C. $\tan x - x$

D. $x - \tan x$

Answer: B

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117. $\int \sin(11x).\sin^9 x dx =$ _____ $+ c.$

A. $\frac{\sin(10x) \cdot \sin^{10} x}{10}$

B. $\frac{\sin^{11} x}{11}$

C. $\frac{\sin(9x) \cdot \sin^9 x}{9}$

D. $\frac{\cos(10x) \cdot \cos^{10} x}{10}$

Answer: A

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118. If $\int e^{2x} f'(x)dx = g(x)$, then

$\int \left[e^{2x} f(x) + e^{2x} f'(x) \right] dx =$

A. $\frac{1}{2}\left[e^{2x} f(x) - g(x) \right] + c$

B. $\frac{1}{2}\left[e^{2x} f(x) - g(x) \right] + c$

C. $\frac{1}{2}\left[e^{2x} f(2x) + g(x) \right] + c$

D. $\frac{1}{2}\left[e^{2x} f'(2x) + g(x) \right] + c$

Answer: B

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119. $\int e^{\sqrt{x}} dx$ is equal to

(A is an arbitrary constant)

A. $e^{\sqrt{x}} + A$

B. $\frac{1}{2} e^{\sqrt{x}} + A$

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

D. $2\left(\sqrt{x}+1\right)e^{\sqrt{x}}+A$

Answer: C

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120. $\int \cos(\log x)dx = F(x) + c$, where c is an arbitrary constant. Here F(x)=

A. $x[\cos(\log x) + \sin(\log x)]$

B. $x[\cos(\log x) - \sin(\log x)]$

C. $\frac{x}{2}[\cos(\log x) + \sin(\log x)]$

D. $\frac{x}{2}[\cos(\log x) - \sin(\log x)]$

Answer: C

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121. Evaluate the following integrals:

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

A. $x - \sqrt{1-x^2}\sin^{-1}x + c$

B. $x + \sqrt{1-x^2}\sin^{-1}x + c$

C. $\sqrt{1-x^2}\sin^{-1}x - x + c$

D. None of these

Answer: A

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122. The integral $\int \cos\left(\log_e x\right)dx$ is equal to: (where C is a constant of integration)

A. $\frac{1}{2}x\left[\cos\left(\log_e x\right) + \sin\left(\log_e x\right)\right] + c$

B. $x\left[\cos\left(\log_e x\right) + \sin\left(\log_e x\right)\right] + c$

C. $\frac{1}{2}x\left[\cos\left(\log_e x\right) - \sin\left(\log_e x\right)\right] + c$

D. $x\left[\cos\left(\log_e x\right) - \sin\left(\log_e x\right)\right] + c$

Answer: A

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123. $\int 32x^3(\log x)^2\,dx$ is equal ot

A. $x^4\left\{8(\log x)^2 - 4(\log x) + 1\right\} + c$

B. $x^3\left\{(\log x)^2 + 2\log x\right\} + c$

C. $x^4\left\{8(\log x)^2 - 4\log x\right\} + c$

D. $8x^4(\log x)^2 + c$

Answer: A

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124. $\int x^4 e^{2x} dx =$

A. $\frac{e^{2x}}{4}\left(2x^4 - 4x^3 + 6x^2 - 6x + 3\right) + c$

B. $\frac{e^{2x}}{2}\left(2x^4 - 4x^3 + 6x^2 - 6x + 3\right) + c$

C. $\frac{e^{2x}}{8}\left(2x^4 - 4x^3 + 6x^2 + 6x + 3\right) + c$

D. $-\frac{e^{2x}}{4}\left(2x^4 - 4x^3 + 6x^2 + 6x + 3\right) + c$

Answer: A

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125. If $\int x^3 e^{5x} dx - \frac{e^{5x}}{5^4}(f(x)) + 0_3$ then $f(x) =$

A. $\frac{x^3}{5} - \frac{3x^2}{5^2} + \frac{6x}{5^3} - \frac{6}{5^4}$

B. $5x^3 - 5^2x^2 + 5^3x - 6$

C. $5^2x^3 - 15x^2 + 30x - 6$

D. $5^3x^3 - 75x^2 + 30x - 6$

Answer: D

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126. If $\int \log\left(a^2 + x^2\right) dx = h(x) + c$, then h(x)=

A. $x\log\left(a^2 + x^2\right) + 2\tan^{-1}\left(\frac{x}{a}\right) + c$

B. $x^2\log\left(a^2 + x^2\right) + x + a\tan^{-1}\left(\frac{x}{a}\right) + c$

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

D. $x^2\log\left(a^2 + x^2\right) + 2x - a^2\tan^{-1}\left(\frac{x}{a}\right) + c$

Answer: C

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127. For $x > 0$, if

$$\int (\log x)^5 dx = x\left[A(\log x)^5 + B(\log x)^4 + C(\log x)^3 + D(\log x)^2 + E(\log x) + F\right]$$

+constant,

then A+B+C+D+E+F =

A. -44

B. -42

C. -40

D. -36

Answer: A

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

A. $x\sec^{-1}x - \log\left|\sqrt{\left(x^2-1\right)}+x\right| + c$

B. $\sec^{-1}x - x\log\left|\sqrt{\left(x^2-1\right)}+x\right| + \sec x + c$

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

D. $x\sec^{-1}x + \log\left|\sqrt{\left(x^2-1\right)}+x\right| + x + c$

Answer: A

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129. $\int e^x\left(\frac{1+x\log x}{x}\right)dx = ?$

A. $e^x + \log x + c$

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

C. $e^x - \log x + c$

D. $e^x \log x + c$

Answer: D

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130. निम्नलिखित समाकलनों के मान ज्ञात कीजिए-

$\int e^x \sin x(\sin x + 2\cos x)dx$

A. $e^x \sin^2 x + c$

B. $e^x \sin x + c$

C. $e^x \sin 2x + c$

D. None of these

Answer: A

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131. Evaluate $\int e^x \frac{2 + \sin 2x}{1 + \cos 2x} dx$

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

B. $e^x + \tan x + c$

C. $2e^x \tan x + c$

D. $e^x \tan 2x + c$

Answer: A

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132. $\frac{x+3}{(x+4)^2}e^x dx$ is equal to

A. $\frac{1}{(x+4)^2}+c$

B. $\frac{e^x}{(x+4)^2}+c$

C. $\frac{e^x}{(x+4)}+c$

D. $\frac{e^x}{(x+3)}+c$

Answer: C

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133. $\int\left(\frac{x+2}{x+4}\right)^2 e^x dx$

A. $e^x\left(\frac{x}{x+4}\right)+c$

B. $e^x\left(\frac{x+2}{x+4}\right)+c$

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

D. $\left(\frac{2xe^x}{x+4}\right)+c$

Answer: A

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134. Evaluste $\int \frac{xe^x}{(1+x)^2}dx$

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

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

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

D. $\frac{e^{-x}}{1+x}+c$

Answer: A

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135. The value of $\int e^x \left[\frac{1+\sin x}{1+\cos x}\right] dx$ is equal to

A. $e^x + c$

B. $e^x \tan\left(\frac{x}{2}\right) + c$

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

D. $\tan\left(\frac{x}{2}\right) + c$

Answer: B

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136. The value of $\int \frac{e^x\left(x^2 \tan^{-1} x + \tan^{-1} x + 1\right)}{x^2+1} dx$ is equal to

A. $\tan^{-1}\left(e^x\right) + c$

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

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

D. $\tan^{-1}\left(x^e\right)+c$

Answer: C

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137. $\int e^{\tan x}\left(\sec^2 x+\sec^3 x \sin x\right)dx$ is equal to

A. $\sec x \cdot \tan x \cdot e^x + c$

B. $\tan x \cdot e^{\tan x} + c$

C. $\sec^2 x \cdot e^{\tan x} + c$

D. $\tan^2 x \cdot e^{\tan x} + c$

Answer: B

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138. $\int e^{\sin x}\left(\frac{\sin x+1}{\sec x}\right)dx$ is equal to

A. $\sin x.\, e^{\sin x} + c$

B. $\cos x.\, e^{\sin x} + c$

C. $e^{\sin x} + c$

D. $e^{\sin x}(\sin x + 1) + c$

Answer: A

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

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

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

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

D. None of these

Answer: A

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140. $\int \frac{e^{\cot^{-1}x}}{1+x^2}\left(x^2 - x + 1\right)dx$_____ $+ c$

A. $-e^{\cot^{-1}x}$

B. $x.\ e^{\cot^{-1}x}$

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

D. $e^{\cot^{-1}x}$

Answer: B

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141. The value of $\int e^{2x}\left(\frac{1}{x} - \frac{1}{2x^2}\right)dx$ is

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

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

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

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

Answer: B

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142. $\int \left(1 + x - x^{-1}\right) e^{x+x^{-1}} dx =$

A. $(x + 1)e^{x+x^{-1}} + c$

B. $(x - 1)e^{x+x^{-1}} + c$

C. $-xe^{x+x^{-1}} + c$

D. $xe^{x+x^{-1}} + c$

Answer: D

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143. If $\int \frac{2x+3}{x^2-5x+6}dx$

$= 9\log(x-3) - 7\log(x-2) + A$, then A =

A. $5\log(x-2)$+constant

B. $-4\log(x-3)$ + constant

C. Constant

D. None of these

Answer: C

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144. $\int \left(\frac{1}{x-3} - \frac{1}{x^2-3x}\right)dx =$ _____ $+ c, x > 3$

A. $\frac{1}{3}\log[x(x-3)]$

B. $\frac{1}{3}\log\left[\sqrt{x}(x-3)\right]$

C. $\frac{2}{3}\log[x(x-3)]$

D. $\frac{2}{3}\log\left[\sqrt{x}(x-3)\right]$

Answer: D

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145. If $\int \frac{1}{\left(x^2+4\right)\left(x^2+9\right)}dx = A\ \tan^{-1}\frac{x}{2} + B\tan^{-1}\left(\frac{x}{3}\right) + C$, then A-B=

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

B. $\frac{1}{30}$

C. $-\frac{1}{30}$

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

Answer: A

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146. समाकलन करें $\int \frac{xdx}{\left(x^2 - a^2\right)\left(x^2 - b^2\right)} dx.$

A. $\frac{1}{a^2 - b^2} \log\left(\frac{x^2 - a^2}{x^2 - b^2}\right) + c$

B. $\frac{1}{a^2 - b^2} \log\left(\frac{x^2 - b^2}{x^2 - a^2}\right) + c$

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

D. $\frac{1}{2\left(a^2 - b^2\right)} \log\left(\frac{x^2 - b^2}{x^2 - a^2}\right) + c$

Answer: C

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147. If : $\int \frac{2x^2 + 3}{\left(x^2 - 1\right)\left(x^2 - 4\right)} dx = \log\left[\left(\frac{x - 2}{x +}\right)^a . \left(\frac{x + 1}{x - 1}\right)^b\right] + c$ then : $(a, b) \equiv$

A. $\frac{1}{2}, \frac{3}{4}$

B. $-1, \frac{3}{2}$

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

D. $-\frac{1}{2}, \frac{3}{4}$

Answer: A

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148. If : $\int \frac{2x^2 + 3}{\left(x^2 - 1\right)\left(x^2 - 4\right)} dx = \log\left[\left(\frac{x - 2}{x +}\right)^a . \left(\frac{x + 1}{x - 1}\right)^b\right] + c$ then : $(a, b) \equiv$

A. $\frac{11}{12}, \frac{5}{6}$

B. $\frac{11}{12}, \frac{-5}{6}$

C. $-\frac{11}{12}, \frac{5}{6}$

D. None of these

Answer: A

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149. $\int \frac{5x^2 + 3}{x^2\left(x^2 - 2\right)} dx =$

A. $\frac{13}{4\sqrt{2}} \log \left| \frac{x + \sqrt{2}}{x - \sqrt{2}} \right| + \frac{3}{2x} + c$

B. $\frac{13}{2\sqrt{2}} \log \left| \frac{\sqrt{2} - x}{\sqrt{2} + x} \right| + \frac{3}{2x} + c$

C. $\frac{5}{3\sqrt{2}} \log \left| \frac{x + \sqrt{2}}{x - \sqrt{2}} \right| + \frac{3}{5}x + c$

D. $\frac{13}{4\sqrt{2}} \log \left| \frac{x - \sqrt{2}}{x + \sqrt{2}} \right| + \frac{3}{2x} + c$

Answer: D

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150. $\int \frac{1}{x^6 + x^4} dx$ is equal to

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

B. $\frac{1}{3x^3} + \frac{1}{x} - \tan^{-1} x + c$

C. $-\frac{1}{3x^3}-\frac{1}{x}+\tan^{-1}x+c$

D. $-\frac{1}{3x^3}+\frac{1}{x}+\tan^{-1}x+c$

Answer: D

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151. $\int\frac{dx}{e^{2x}-3e^x}=$

A. $\frac{1}{3e^x}-\frac{x}{9}+\frac{1}{9}\log\left(e^x+3\right)+c$

B. $\frac{1}{3e^x}+\frac{1}{9}\log\left(e^x-3\right)-\frac{x}{9}+c$

C. $-\frac{1}{3e^x}-\frac{x}{9}+c$

D. $-\frac{1}{3e^x}-\frac{1}{9}\log\left(e^x+3\right)+c$

Answer: B

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152. If $\int \frac{x}{\left(x^2+1\right)(x-1)}dx$

$= A\log\left|x^2+1\right| + B\tan^{-1}x + C\log|x-1| + D,$

then A+B+C =

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

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

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

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

Answer: C

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153. $\int \frac{2x+3}{(x-1)\left(x^2+1\right)}dx = \log_e\left\{(x-1)^{\frac{5}{2}}\left(x^2+1\right)^a - \frac{1}{2}\tan^{-1}x + C, x > 1\right.$

where C is any arbitrary constant, then the value of 'a' is

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

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

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

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

Answer: D

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154. $\int \frac{dx}{x\left(x^4+1\right)} =$

A. $\frac{1}{4}\log\left(\frac{x^4+1}{x^4}\right)+c$

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

C. $\frac{1}{4}\log\left(x^4+1\right)+c$

D. $\frac{1}{4}\log\left(\frac{x^4}{x^4+2}\right)+c$

Answer: B

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155. $\int \frac{dx}{x^3 + 3x^2 + 2x} =$

A. $\log|x| + \log\left|\frac{x+2}{x+1}\right| + c$

B. $\log|x| - \log|x+1| + \log|x+2| + c$

C. $\frac{1}{2}[\log|x| + \log|x+1| + \log|x+2|] + c$

D. $\frac{1}{2}\log\left[\frac{|x^2+2x|}{(x+1)^2}\right] + c$

Answer: D

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156. $\int \frac{dx}{\sin x + \sin 2x}$ का मान ज्ञात कीजिए।

A. $\frac{1}{6}\log(1 - \cos x) + \frac{1}{2}\log(1 + \cos x) - \frac{2}{3}\log(1 + 2\cos x) + c$

B. $6\log(1 - \cos x) + 2\log(1 + \cos x) - \frac{2}{3}\log(1 + 2\cos x) + c$

C. $6\log(1 - \cos x) + \frac{1}{2}\log(1 + \cos x) + \frac{2}{3}\log(1 + 2\cos x) + c$

D. None of these

Answer: A

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157. If $\int \frac{f(x)}{\log\cos x} dx = -\log(\log\cos x) + c$, then f(x) is equal to

A. $\tan x$

B. $-\sin x$

C. $-\cos x$

D. $-\tan x$

Answer: A

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158. If $\int \frac{f(x)}{\log(\sin x)} dx = \log[\log \sin x] + c$, then f(x) is equal to

A. cot x

B. tan x

C. sec x

D. cosec x

Answer: A

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159. If $\int f(x) \cos x dx = \frac{1}{2}[f(x)]^2 + c$, then $f\left(\frac{\pi}{2}\right)$ is

A. c

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

C. $c + 1$

D. $2\pi + c$

Answer: C

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160. If $\int f(x) \cdot \cos x dx = \frac{1}{2}\{f(x)\}^2 + c$, then $f(0) =$ (A) 1 (B) 0 (C) -1 (D) none of these

A. 1

B. -1

C. 0

D. 2

Answer: A

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161. If $f'(x) = 2 - \frac{5}{x^4}$ and $f(1) = \frac{14}{3}$, then $f(-1) =$

A. 0

B. $\frac{11}{3}$

C. $\frac{-14}{3}$

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

Answer: D

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162. If $\int f(x)\sin x\cos x dx = \frac{1}{2\left(b^2 - a^2\right)}\log\{f(x)\} + C$ then f(x) is equal to

A. $\frac{2}{\left(b^2 - a^2\right)\sin 2x}$

B. $\frac{2}{ab\sin 2x}$

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

D. $\frac{2}{ab\cos 2x}$

Answer: C

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163. If $\frac{d}{dx}[f(x)] = x\cos x + \sin x$ and $f(0) = 2$,

then f(x)=

A. $x\sin x$

B. $x\cos x + \sin x + 2$

C. $x\sin x + 2$

D. $x\cos x + 2$

Answer: C

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164. If $\int \log\left(x^2 + x\right)dx = x\log\left(x^2 + x\right) + A$, then A=

A. $2x + \log|x + 1|$ + constant

B. $2x$ - $\log|x + 1|$ + constant

C. constant

D. none of these

Answer: D

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165. If $I_1 = \int \sin^{-1} x dx$ and $I_2 \sin^{-1} \sqrt{-x^2} dx$, then

A. $I_1 = I_2$

B. $I_2 = \frac{\pi}{2} I_2$

C. $I_1 + I_2 = \frac{\pi}{2} x$

D. $I_1 - I_2 = \frac{\pi}{2} x$

Answer: C

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EVALUATION TEST

1. $\int \frac{\sqrt{5+x^{10}}}{x^{16}} dx$ is equal to

A. $-\frac{1}{75}\left(1+\frac{5}{x^{10}}\right)+c$

B. $-\frac{1}{50}\left(1+\frac{5}{x^{10}}\right)^{\frac{3}{2}}+c$

C. $-\frac{1}{50}\left(1+\frac{5}{x^{10}}\right)^{\frac{1}{2}}+c$

D. $-\frac{1}{75}\left(1+\frac{5}{x^{10}}\right)^{\frac{3}{2}}+c$

Answer: D

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2. Evaluate: $\int \frac{\cos 5x+\cos 4x}{1-2\cos 3x} dx$

A. $-\left[\frac{\sin 2x}{2}+\sin x\right]+c$

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

C. $\frac{\sin 2x}{2} + \cos x + c$

D. None of these

Answer: A

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

A. $a\left[\sqrt{\frac{x}{a}}\tan^{-1}\sqrt{\frac{x}{a}} - \sqrt{\frac{x}{a}} + \tan^{-1}\sqrt{\frac{x}{a}}\right) + c$

B. $a\left[\tan^{-1}\sqrt{\frac{x}{a}} - \sqrt{\frac{x}{a}} + \tan^{-1}\sqrt{\frac{x}{a}}\right) + c$

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

D. None of these

Answer: C

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4. $\int \sqrt{\operatorname{cosec} x - 1}\, dx =$

A. $\log \left| \frac{1}{2}\sin x + \frac{1}{2}\sqrt{\sin^2 x + \sin x} \right| + c$

B. $\log \left| \sin x + \frac{1}{2}\sqrt{\sin^2 x + \sin x} \right| + c$

C. $\frac{1}{2}\log \left| \sin x + \sqrt{\sin^2 x + \sin x} \right| + c$

D. $\log \left| \sin x + \frac{1}{2} + \sqrt{\sin^2 x + \sin x} \right| + c$

Answer: D

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5. Evaluate: $\int \sqrt{\tan x}\, dx$

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

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

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

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

Answer: D

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6. $\int x^{13/2}\left(1+x^{5/2}\right)^{1/2}dx=$

A. $\frac{2}{5}\left[\frac{2}{7}\left(1+x^{5/2}\right)^{7/2}+\frac{4}{5}\left(1+x^{5/2}\right)^{5/2}+\frac{2}{3}\left(1+x^{5/2}\right)^{3/2}\right]+c$

B. $\frac{2}{5}\left[\frac{2}{7}\left(1+x^{5/2}\right)^{7/2}-\frac{4}{5}\left(1+x^{5/2}\right)^{5/2}-\frac{2}{3}\left(1+x^{5/2}\right)^{3/2}\right]+c$

C. $\frac{2}{5}\left[\frac{2}{7}\left(1+x^{5/2}\right)^{7/2}+\frac{4}{5}\left(1+x^{5/2}\right)^{5/2}-\frac{2}{3}\left(1+x^{5/2}\right)^{3/2}\right]+c$

D. $\frac{2}{5}\left[\frac{2}{7}\left(1+x^{5/2}\right)^{7/2}-\frac{4}{5}\left(1+x^{5/2}\right)^{5/2}+\frac{2}{3}\left(1+x^{5/2}\right)^{3/2}\right]+c$

Answer: D

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

$= x - \frac{2}{\sqrt{A}} \tan^{-1}\left(\frac{2\tan x + 1}{\sqrt{A}}\right) + c$, then A=

A. 2

B. 3

C. 4

D. 5

Answer: B

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8. If $\int \frac{1}{\left(x^2 - 1\right)} \log\left(\frac{x - 1}{x + 1}\right) dx = A\left[\log\left(\frac{x - 1}{x + 1}\right)\right]^2 + c,$

then A =

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

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

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

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

Answer: C

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9. $\int \frac{1}{\left(x^2+2x+2\right)^2} dx =$

A. $\frac{\tan^{-2}\sqrt{x+1}}{2} + \frac{x+1}{x^2+2x+2} + c$

B. $\frac{1}{2}\left[\sec^{-1}\left(\sqrt{x+1}\right) + \frac{x+1}{x^2+2x+2}\right] + c$

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

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

Answer: C

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10. Evaluate: $\int \frac{1}{\cos^6 x + \sin^6 x} dx$

A. $\tan^{-1}(\tan x - \sec x) + c$

B. $\tan^{-1}(\sec x - \tan x) + c$

C. $\sec^{-1}(\tan x - \cot x) + c$

D. $\tan^{-1}(\tan x - \cot x) + c$

Answer: D

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11. If $\int f(x)\sin x \cos x dx = \frac{1}{2\left(b^2 - a^2\right)} \log\{f(x)\} + C$ then f(x) is equal to

A. $\frac{1}{a^2\sin^2 x + b^2\cos^2 x}$

B. $\frac{1}{a^2\sin^2 x - b^2\cos^2 x}$

C. $\frac{1}{a^2\cos^2 x - b^2\sin^2 x}$

D. $\frac{1}{a^2\cos^2 x + b^2\sin^2 x}$

Answer: A

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12. $\int e^{\sin\theta}\left[\log(\sin\theta) + \cos ec^2\theta\right]\cos\theta d\theta =$

A. $e^{\sin\theta}\left[\log(\sin\theta) + \cos ec^2\theta\right] + c$

B. $e^{\sin\theta}[\log(\sin\theta) + \cos ec\theta] + c$

C. $e^{\sin\theta}[\log(\sin\theta) - \cos ec\theta] + c$

D. $e^{\sin\theta}\left[\log(\sin\theta) - \cos ec^2\theta\right] + c$

Answer: C

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13. $\int \cos 2\theta \log\left(\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta}\right) d\theta$ is equal to

A. $(\cos\theta - \sin\theta)^2 \log\left(\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta}\right) + c$

B. $(\cos\theta + \sin\theta)^2 \log\left(\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta}\right) + c$

C. $\frac{(\cos\theta - \sin\theta)^2}{2} \log\left(\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta}\right) + c$

D. $\frac{1}{2}\sin 2\theta \log\tan\left(\frac{\pi}{4} + \theta\right) - \frac{1}{2}\log(\sec 2\theta) + c$

Answer: D

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14. If $f\left(\frac{3x - 4}{3x + 4}\right) = x + 2$, then $\int f(x)dx$ is equal to

A. $\frac{8}{3}\log|x - 1| + \frac{x}{3} + c$

B. $-\frac{8}{3}\log|x - 1| + \frac{2}{3}x + c$

C. $\frac{8}{3}\log|x - 1| + \frac{2}{3}x + c$

D. $\frac{8}{3}\log|x-1| - \frac{x}{3} + c$

Answer: B

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15. $\int \log\left(1-\sqrt{x}\right)dx =$

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

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

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

D. None of these

Answer: B

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16. If

$$P(x) = \int \frac{x^3}{x^3 - x^2} dx, Q(x) = \int \frac{1}{x^3 - x^2} dx \text{ and } (P + Q)(2) = \frac{5}{2}, \text{ then } P(3) + Q(3) =$$

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

B. $\frac{5}{4} + \log\left(\frac{4}{3}\right)$

C. $\frac{10}{3} + \log\left(\frac{4}{3}\right)$

D. $\frac{10}{3} + \log\left(\frac{8}{3}\right)$

Answer: D

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17. $\int \frac{2a\sin x + b\sin 2x}{(b + a\cos x)^3} dx =$

A. $\frac{1}{a^2} \cdot \frac{\left(a^2 - b^2\right)}{t^2} + \frac{2b}{a^2 t} + c$

B. $\frac{2}{a^2} \cdot \frac{\left(a^2 - b^2\right)}{t^2} + \frac{2b}{a^2 t} + c$

C. $\frac{2}{a^2} \cdot \frac{\left(a^2 - b^2\right)}{t^2} + \frac{b}{a^2 t} + c$

D. $\frac{2}{a^2} \cdot \frac{\left(a^2 - b^2\right)}{t^3} + \frac{2b}{a^2 t} + c$

Answer: A

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18. $\int \frac{1}{(x-1)\sqrt{x^2-4}} dx =$

A. $-\frac{1}{\sqrt{5}} \log \left| \frac{1}{x-1} + \frac{1}{5} + \sqrt{\frac{x^2+4}{(x-1)^2}} \right| + c$

B. $-\frac{1}{\sqrt{5}} \log \left| \frac{1}{x-1} + \frac{1}{5} + \sqrt{\frac{x^2+4}{5(x-1)^2}} \right| + c$

C. $-\frac{1}{\sqrt{5}} \log \left| \frac{1}{x-1} + \frac{1}{5} \sqrt{\frac{x^2+4}{(x-1)^2}} \right| + c$

D. None of these

Answer: B

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

A. $\frac{1}{2}\log\left|\frac{x^2e^{2\sin x}}{1 - x^2e^{2\sin x}}\right| + c$

B. $\log\left|\frac{x^2e^{2\sin x}}{1 - x^2e^{2\sin x}}\right| + c$

C. $\frac{1}{2}\log\left|\frac{xe^{\sin x}}{1 - x^2e^{\sin x}}\right| + c$

D. $\frac{1}{2}\log\left|\frac{xe^{\sin x}}{1 - xe^{\sin x}}\right| + c$

Answer: A

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20. $\int \tan\left(\sin^{-1}x\right)dx =$

A. $\frac{1}{\sqrt{1 - x^2}} + c$

B. $\sqrt{1 - x^2} + c$

C. $\frac{x}{\sqrt{1 - x^2}} + c$

D. $-\sqrt{1 - x^2} + c$

Answer: D

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21. $\int \sec^{25/13} x \operatorname{cosec}^{27/13} x dx =$

A. $-\frac{15}{13}(\tan x)^{-15/13} + \frac{3}{12}(\tan x)^{3/2} + c$

B. $-\frac{13}{14}(\tan x)^{-14/13} + \frac{13}{12}(\tan x)^{12/13} + c$

C. $-\frac{14}{13}(\tan x)^{-13/14} + \frac{2}{3}(\tan x)^{3/2} + c$

D. None of these

Answer: B

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22.

$$\int \frac{1}{x+\sqrt{x^2-x+1}}dx = P\log\left(x+\sqrt{x^2-x+1}\right)+Q\log\left(2x-1+2\sqrt{x^2-x+1}\right)+R$$

Then the values of P, Q, R are

A. $2, \frac{3}{2}, \frac{1}{2}$

B. $2, -\frac{3}{2}, \frac{1}{2}$

C. $2, -\frac{3}{2}, -\frac{1}{2}$

D. None of these

Answer: C

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23. If $\int \frac{1}{\left(1+x^2\right)\sqrt{1-x^2}}dx = F(x)+c$ and $F(1)=0$,

then for $x>0$, $F(x)=$

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

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

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

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

Answer: D

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24. $\int\frac{x^2-1}{x^3\sqrt{2x^4-2x^2+1}}dx$ is equal to

A. $2\sqrt{2-\frac{2}{x^2}+\frac{1}{x^4}}+c$

B. $2\sqrt{2+\frac{2}{x^2}+\frac{1}{x^4}}+c$

C. $\frac{1}{2}\sqrt{2-\frac{2}{x^2}+\frac{1}{x^4}}+c$

D. None of these

Answer: C

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25. The value of $\int \frac{\log x}{(x+1)^2} dx$ is

A. $\frac{-\log x}{x+1} + \log|x| - \log|x+1| + c$

B. $\frac{\log x}{x+1} + \log|x| - \log|x+1| + c$

C. $\frac{\log x}{x+1} - \log|x| - \log|x+1| + c$

D. $\frac{-\log x}{x+1} - \log|x| - \log|x+1| + c$

Answer: A

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26. If $I_n = \int \sin^n x \, dx$, then $nI_n - (n-1)I_{n-2}$ equals

A. $\sin^{n-1}x\cos x$

B. $\cos^{n-1}x\sin x$

C. $-\sin^{n-1}x\cos x$

D. $-\cos^{n-1}x\sin x$

Answer: C

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27. If $u = -f'(\theta)\sin\theta + f(\theta)\cos\theta$ and $v = f'(\theta)\cos\theta + f(\theta)\sin\theta$,then $\int\left[\left(d\frac{u}{d\theta}\right)^2 + \left(\frac{dy}{d\theta}\right)^2\right]^{\frac{1}{2}} d\theta$ is equal to

A. $f(\theta) - f'(\theta) + c$

B. $f(\theta) + f'(\theta) + c$

C. $f(\theta) + f'(\theta) + c$

D. $f(\theta) - f'(\theta) + c$

Answer: B

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

A. $2\tan^{-1}\sqrt{x+\frac{1}{x}+1}+c$

B. $2\tan^{-1}\sqrt{\frac{1}{x+1}+x}+c$

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

D. None of these

Answer: A

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29. Evaluate $\int\left(\sqrt{\tan x}+\sqrt{\cot x}\right)dx$

A. $\sin^{-1}(\sin x - \cos x) + c$

B. $\sqrt{2}\sin^{-1}(\sin x - \cos x) + c$

C. $\cos^{-1}(\sin x - \cos x) + c$

D. $\sqrt{2}\cos^{-1}(\sin x - \cos x) + c$

Answer: B

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