MATHS

BOOKS - MARVEL MATHS (HINGLISH)

INTEGRATION - INDEFINITE INTEGRALS

MULTIPLE CHOICE QUESTIONS (PART - A : Building - Up The BASE)

1. $\int\left[\frac{d}{dx}f(x)\right]dx =$

A. $f'(x) + c$

B. $f(x) + c$

C. $\int f(x)dx$

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

Answer: B

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2. $\frac{d}{dx}\left[\int f(x)dx\right] =$

A. $f(x)$

B. $f(x) + c$

C. $f'(x)$

D. $e^{f'(x)}$

Answer: A

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3. If $\int f(x)dx = h(x)$ and $\int f(x)dx = g(x)$ as well, then

A. $h(x) = g(x)$

B. $h(x) + g(x)$= constant

C. $h(x).\ g(x) =$ constant

D. $h(x)$ - $g(x) =$ constant

Answer: D

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4. $\int x\sqrt{x}dx =$

A. $1.5\sqrt{x}$

B. $2.5x^{1.5}$

C. $0.4x^{2.5}$

D. $0.4x\sqrt{x}$

Answer: C

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5. $\int\left(xx^{3}x^{5}x^{7}\dots\text{ to n terms }\right)dx =$

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

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

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

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

Answer: C

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6. $\int x(x+1)(x+2)dx =$

A. $x^4 + x^3 + x^2 + c$

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

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

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

Answer: D

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7. $\int \frac{(x+1)(x+2)}{x} dx =$

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

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

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

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

Answer: B

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

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

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

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

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

Answer: A

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

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. $\int \frac{x+4}{x+1} dx =$

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

B. $x - 5\log(x+4) + c$

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

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

Answer: C

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

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

B. $x + 5\log(x+3) + c$

C. $x + 5\log(x - 2) + c$

D. $x - 5\log(x + 3) + c$

Answer: D

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12. $\int \frac{4x + 3}{4x - 1} dx =$

A. $x + \log(4x - 1) + c$

B. $4x + \log(4x - 1) + c$

C. $x + 4\log(4x + 3) + c$

D. $x^{\$} + \log(4x + 3) + c$

Answer: A

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

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

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

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

D. $2x + 3\log x + c$

Answer: D

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

A. $\frac{2}{x} + \frac{4}{3}\log x + c$

B. $\frac{x}{2} + \frac{x^2}{6} + c$

C. $\frac{x}{2} - \frac{3}{4}\log(2x + 3) + c$

D. $\frac{x}{2} + \frac{4}{3}\log(2x + 3) + c$

Answer: C

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15. If $\int \frac{3x + 4}{5x - 7} dx = ax + b.\log(5x - 7) + c$, then $(a, b) \equiv$

A. $\left(\frac{5}{3}, \frac{25}{41}\right)$

B. $\left(\frac{3}{5}, \frac{41}{25}\right)$

C. $(3, 41)$

D. $(5, 25)$

Answer: B

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16. If $\int \frac{8x+7}{3x-2}dx = px - q.\log(3x-2) + r,$ then $(p, q) \equiv$

A. $\left(\frac{8}{3}, \frac{37}{9}\right)$

B. $(24, 37)$

C. $\left(\frac{37}{9}, \frac{8}{3}\right)$

D. $(8, 37)$

Answer: A

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17. $\int \frac{x^2 - 2}{x^2 + 1} dx =$

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

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

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

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

Answer: B

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18. $\int \frac{x^2 - 3}{x^2 + 1} dx = \ldots.$

A. $4x + \tan^{-1} x + c$

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

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

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

Answer: C

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19. If $\int \frac{x^3 + 4x^2 - 7x + 5}{x + 2} dx = \frac{x^3}{3} + ax^2 - 11x + b\log(x + 2) + c$,

then $(a, b) \equiv$

A. $(-1, 27)$

B. $(1, -27)$

C. $(-1, -27)$

D. $(1, 27)$

Answer: D

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20. If $\int \frac{3x^2 + 4x - 2}{x - 1} dx = \frac{3x^2}{2} + ax + b\log(x - 1) + c$ then (a,b)=

A. $(7, 5)$

B. $(5, 7)$

C. $(-7, -5)$

D. $(-5, -7)$

Answer: A

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21. $\int (2x + 1)\sqrt{x + 1}dx =$

A. $\frac{4}{5}(x+1)^{3/2} - \frac{2}{3}(x+1)^{5/2} + c$

B. $\frac{4}{5}(x+1)^{5/2} - \frac{2}{3}(x+1)^{3/2} + c$

C. $\frac{2}{5}(x+1)^{5/2} - \frac{2}{3}(x+1)^{3/2} + c$

D. $\frac{5}{2}(x+1)^{2/5} + \frac{3}{2}(x+1)^{2/3} + c$

Answer: B

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22. $\int (x+1)\sqrt{2x-1}dx =$

A. $\frac{1}{10}(2x-1)^{3/2} + \frac{1}{2}(2x-1)^{5/2} + c$

B. $\frac{1}{10}(2x-1)^{5/2} - \frac{1}{2}(2x-1)^{3/2} + c$

C. $\frac{1}{10}(x+1)^{5/2} + \frac{1}{2}(x+1)^{3/2} + c$

D. $\frac{1}{10}(x+1)^{5/2} + \frac{1}{2}(x+1)^{3/2} + c$

Answer: C

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23. $\int \frac{3x - 1}{\sqrt{2x + 3}} dx =$

A. $\frac{1}{2}\sqrt{2x + 3} - \frac{11}{2}(2x + 3)^{3/2} + c$

B. $\frac{1}{2}(2x + 3)^{3/2} - \frac{11}{2}(2x + 3)^{1/2} + c$

C. $3\sqrt{2x + 3} - 11(2x + 3)^{3/2} + c$

D. $\frac{1}{3}(2x + 3)^{3/2} + \frac{11}{3}(2x + 3)^{1/2} + c$

Answer: B

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24. $\int \frac{2x+3}{\sqrt{3x-1}}dx =$

A. $\frac{4}{27}\sqrt{3x-1} + \frac{22}{9}(3x-1)^{3/2} + c$

B. $\frac{4}{27}(3x-1)^{3/2} - \frac{22}{9}\sqrt{3x-1} + c$

C. $\frac{4}{27}(3x-1)^{3/2} + \frac{22}{9}\sqrt{3x-1} + c$

D. $\frac{4}{27}(2x+3)^{3/2} + \frac{22}{9}\sqrt{2x+3} + c$

Answer: C

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25. $\int \frac{1}{x\sqrt{x-1}}dx =$

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

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

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

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

Answer: B

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26. If $\int \frac{1}{(x+1)\sqrt{x-1}}dx = k.\tan^{-1}\sqrt{\frac{x-1}{2}} + c$

then $k =$

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

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

C. $2\sqrt{2}$

D. $\sqrt{2}$

Answer: D

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27. if $\int \frac{dx}{(2x+1)\sqrt{x-2}}dx = \sqrt{a}.\tan^{-1}\sqrt{b(x-2)}+c$ then

A. $a < b$

B. $a > b$

C. $a = b$

D. $a^b = 100$

Answer: C

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

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

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

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

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

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

Answer: B

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

A. $\frac{x^5}{5} - x^2 + \frac{1}{x} + c$

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

C. $\frac{x^5}{5} + x^2 - \frac{1}{x} + c$

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

Answer: C

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

A. $\sec x$

B. $\cos x$

C. $\tan x$

D. $\cot x$

Answer: A

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

A. $\sec x$

B. $-\cot x$

C. $\tan x$

D. $\cot x$

Answer: B

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33. $\int \cos x^{\circ} dx =$

A. $\sin x^{\circ}$

B. $\sin x$

C. $\frac{180}{\pi}\sin\left(\frac{\pi}{180}x\right)$

D. $\frac{180}{\pi}\sin x$

Answer: C

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34. $\int(\sin x - \cos x)^2 dx =$

A. $x - 0.5\cos 2x$

B. $x + \cos 2x + c$

C. $x + 0.5\sin 2x$

D. $x + 0.5\cos 2x$

Answer: D

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

A. $\sin x - \cos x$

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

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

D. $\cos 2x + c$

Answer: C

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36. $\int\left[\left(\sin^2.\frac{x}{2} - \cos^2.\frac{x}{2}\right)^2 + 4\sin^2.\frac{x}{2}.\cos^2.\frac{x}{2}\right]dx =$

A. 0

B. 1

C. x

D. c

Answer: C

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

A. $\sec x - \cos x$

B. $\sin x - \cos x$

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

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

Answer: C

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

A. $\tan x - \cot x$

B. $\cot x - \tan x$

C. $\tan x + \cot x$

D. $-(\tan x + \cot x)$

Answer: D

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

A. $\sin x + c$

B. $\cos x + c$

C. $\tan x$

D. $\cot x$

Answer: C

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40. $4\int \frac{\sin^3 x + \cos^3 x}{\sin^2 2x} dx =$

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

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

C. $\sin x - \cos x + c^3$

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

Answer: A

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41. $\int \sin^2 4x dx =$

A. $\frac{x}{2} + \frac{\sin 8x}{16} + c$

B. $\frac{x}{2} - \frac{\sin 8x}{16} - c$

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

D. $4\sin 8x + c$

Answer: B

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42. $\int \cos^2 5x dx =$

A. $\sin^2 5x + c$

B. $\frac{x}{2} - \frac{\sin 10x}{2} + c$

C. $\frac{x}{2} + \frac{\sin 10x}{20} + c$

D. $-5\sin 10x + c$

Answer: C

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43. $\int \left(\sin^2 6x - \cos^2 7x\right) dx =$

A. $c - \frac{\sin 12x}{24} - \frac{\sin 14x}{28}$

B. $\frac{\cos 6x}{6} - \frac{\sin 7x}{7} + c$

C. $\frac{\cos 12x}{12} - \frac{\sin 14x}{14}$

D. $6\sin 12x + 7\sin 14x + c$

Answer: A

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44. $\int \sin^2 x. \cos^2 x dx =$

A. $\frac{x}{8} + \frac{\sin 4x}{32} + c$

B. $-\frac{x}{8} - \frac{\sin 4x}{32} + c$

C. $\frac{\sin 4x}{32} - \frac{x}{8} + c$

D. $\frac{x}{8} - \frac{\sin 4x}{32} + c$

Answer: D

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

A. $\tan x + \cot x$

B. $\tan x - \cot x$

C. $\sec x + \tan x$

D. $2\cot 2x + c$

Answer: B

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46. If $\int \sin^4 x dx = ax + b\sin 2x + c\sin 4x + d$, then $(a, b, c) \equiv$

A. $\left(\frac{3}{8}, \frac{-1}{4}, \frac{1}{32}\right)$

B. $\left(\frac{-3}{8}, \frac{1}{4}, \frac{1}{16}\right)$

C. $(1, 1, 0)$

D. $(1, 0, 1)$

Answer: A

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47. $\int\left(\sin^4 x + \cos^4 x\right)dx =$

A. $\frac{3x}{4} - \frac{\sin 4x}{16} + c$

B. $\frac{\sin 4x}{16} - \frac{3x}{4} + c$

C. $\frac{3x}{4} + \frac{\sin 4x}{16}$

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

Answer: C

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48. $\int \tan^2\left(\frac{x}{2}\right)dx =$

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

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

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

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

Answer: B

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49. $\int \cot^2\left(\frac{x}{3}\right)dx =$

A. $x + 3\cot\left(\frac{x}{3}\right)$

B. $x - 3\cot\left(\frac{x}{3}\right)$

C. $x + 3\cot x$

D. $-x - 3\cot\left(\frac{x}{3}\right)$

Answer: D

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

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

B. $2(\sec x + \tan x) - x$

C. $2(\sec x - \tan x) + x$

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

Answer: B

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

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

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

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

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

Answer: A

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52. $\int \frac{1}{1 - \cos 3x} dx =$

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

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

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

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

Answer: C

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53. $\int \frac{1}{1 - \sin x} dx$

A. $\sec x + \tan x$

B. $\sec x - \tan x$

C. $\cos x + \cot x$

D. $\cos x - \cot x$

Answer: A

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54. $\int \sqrt{1 - \cos x}dx = ?$

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

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

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

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

Answer: B

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55. $\int \sqrt{1 + \cos 5x}dx =$

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

B. $\frac{\sqrt{2}}{5}\sin\left(\frac{5x}{2}\right) + c$

C. $\frac{2\sqrt{2}}{5}\sin\left(\frac{5x}{2}\right) + c$

D. $\frac{2\sqrt{2}}{5}\cos\left(\frac{5x}{2}\right) + c$

Answer: C

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56. $\int \sqrt{1 + \sin x} dx$

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

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

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

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

Answer: A

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57. $\int \sqrt{1 - \sin 7x} dx =$

A. $\sin.\frac{7x}{2} - \cos.\frac{7x}{2}$

B. $\frac{2}{7}\left(\sin.\frac{7x}{2}+\cos.\frac{7x}{2}\right)$

C. $\frac{7}{2}\left(\sin.\frac{7x}{2}-\cos.\frac{7x}{2}\right)$

D. $\frac{2}{7}\left(\cos.\frac{7x}{2}-\sin.\frac{7x}{2}\right)$

Answer: B

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

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

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

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

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

Answer: D

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59. $\int \sin 4x . \sin 7x dx =$

A. $\frac{\sin 3x}{6} - \frac{\sin 11x}{22}$

B. $\frac{\sin 3x}{6} + \frac{\sin 11x}{22}$

C. $\frac{\cos 3x}{6} - \frac{\cos 11x}{22}$

D. $\frac{\cos 4x . \cos 7x}{28}$

Answer: A

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60. $\int 6x\sqrt{2x^2 + 5}dx =$

A. $24x\left(2x^2 + 5\right)^{-1/2}$

B. $\left(2x^2 + 5\right)^{3/2}$

C. $1.5\left(2x^2 + 5\right)^{3/2}$

D. $12\left(2x^2 + 5\right)^{3/2}$

Answer: B

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61. $\int \frac{4x + 6}{\sqrt{x^2 + 3x - 2}}dx =$

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

B. $4\sqrt{x^2 + 3x - 2}$

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

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

Answer: B

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62. $\int 5\left(2x^2 + 3x - 4\right)^{2/3}(4x + 3)dx =$

A. $3\left(2x^2 + 3x - 4\right)^{-1/3}$

B. $\sqrt{2x^2 + 3x - 4}$

C. $3\left(2x^2 + 3x - 4\right)^{5/3}$

D. $\left(2x^2 + 3x - 4\right)^{2/3}$

Answer: C

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63. $\int \frac{1}{x + x^{-3}} dx =$

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

B. $\log\left(x + x^{-3}\right) + c$

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

D. $0.25\log\left(1 + x^4\right) + c$

Answer: D

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64. $\int \frac{\left(7 - 3\sqrt{x}\right)^{5/2}}{\sqrt{x}} dx =$

A. $\frac{-4}{21}\left(7 - 3\sqrt{x}\right)^{7/2}$

B. $\frac{5}{2}\left(7 - 3\sqrt{x}\right)^{3/2}$

C. $\frac{21}{4}\left(7 - 3\sqrt{x}\right)^{7/2}$

D. $\frac{21}{4}(7 - 3x)^{2/7}$

Answer: A

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

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

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

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

D. $\frac{2}{3}x^{3/2} - \frac{x^2}{2} + c$

Answer: C

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66. `int(1-cossqrtx)/(sqrtx)dx=

A. $\sqrt{x}$ - $2\sin\sqrt{x}$

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

C. $2\sqrt{x} + \sin\sqrt{x}$

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

Answer: B

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67. $\int 5\sin^{3/2}x\cos x dx =$

A. $5\sin^{5/2}x + c$

B. $2\sin^{5/2}x + c$

C. $\frac{5}{2}\sin^{5/2}x + c$

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

Answer: B

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68. $\int \left(1 + \tan^3 x\right)\sec^2 x dx =$

A. $\tan x + 0.25\tan^4 x$

B. $-\cot x - 0.25\cot^4 x + c$

C. $\sec x + 0.25\sec^4 x + c$

D. $x + 0.25\sec^4 x + c$

Answer: A

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69. $\int \frac{1 - \tan x}{1 + \tan x} dx =$

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

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

C. $\log(\sin x + \cos x) - k$

D. $\log\left[\sec\left(\frac{\pi}{4} - x\right)\right] + c$

Answer: C

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70. $\int \sqrt{1 - \sin x}dx =$

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

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

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

D. $x + \cos x + c$

Answer: B

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

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

B. $\log\left(2\cos^2 x + 3\sin^2 x\right) + c$

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

D. $2x + 3\sec x + c$

Answer: A

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72. $\int 6xe^{x^2} dx =$

A. $3e^{2x}$

B. $2e^{x^2}$

C. $3e^{x^2}$

D. $x.\ e^{x^2}$

Answer: C

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73. $\int \frac{e^x}{\sin^2(e^x)}dx =$

A. $\cot(e^{-x}) + c$

B. $-\cot(e^x) + c$

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

D. $\cos^2(e^x) + c$

Answer: B

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

A. $e^{x}\tan\left(xe^{x}\right)$

B. $e^{x}\tan\left(xe^{-x}\right)$

C. $-\cot\left(xe^{x}\right)$

D. $\tan\left(xe^{x}\right)$

Answer: D

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75. $\int \frac{1}{1+e^{-x}}dx =$

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

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

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

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

Answer: C

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76. $\int \frac{e^{2x} + 1}{e^{2x} - 1} dx =$

A. $\log\left(e^{x} - e^{-x}\right) + \alpha$

B. $\log\left(e^{x} + e^{-x}\right) + \beta$

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

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

Answer: A

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77. $\int \frac{1}{x\sin^2(\log x)}dx =$

A. $\tan(\log x)$

B. $-\cot(\log x)$

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

D. $-\log(\cot x)$

Answer: B

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78. $\int \frac{9(2 - 3\log x)^2}{x}dx =$

A. $(3 - 2\log x)^3$

B. $-(3\log x - 2)^3$

C. $-(2 - 3\log x)^3$

D. $(2x - 3\log x)^3$

Answer: C

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

A. $(\log 2).\ \log(\log x)$

B. $\log(2 + \log x)$

C. $\log(2.\ \log x)$

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

Answer: B

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

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

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

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

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

Answer: C

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81. $\int \frac{\tan^{-1}x}{1+x^2}dx =$

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

B. $0.5\left(\tan^{-1}x\right)^2 + c$

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

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

Answer: B

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82. $\int \frac{x\sin^{-1}\left(x^2\right)}{\sqrt{1 - x^4}} dx =$

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

B. $0.25\sin^{-2}\left(x^2\right) + c$

C. $0.25\left(\sin^{-1}x^2\right)^2 + c$

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

Answer: C

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83. $\int \frac{6x^2 \tan^{-1}(x^3)}{1+x^6} dx =$

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

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

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

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

Answer: A

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84. if $x = \phi(t)$ and $\int f(x)dx = F(x)$ then $\int f(\phi(t))\phi'(t)dt =$ (A) $\phi(x)$ (B) $F(t)$ (C) $F(x)$ (D) $F'(x)$

A. $\phi(x)$

B. $F(t)$

C. $F(x)$

D. $F'(x)$

Answer: C

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85. If $\int f(x)dx = F(x)$, then $\int \frac{f(x)}{F'(x)}dx =$

A. $x + c$

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

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

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

Answer: A

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86. If $\int f(x)dx = F(x)$, then $\int \frac{f(x)}{F'(x)}dx =$

A. $x + c$

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

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

D. $e^{F(x)} + c$

Answer: C

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87. $\int \sqrt{\frac{1 - \cos 2x}{1 + \cos 2x}} dx =$

A. $\sec^2 x + c$

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

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

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

Answer: B

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88. $\int \sqrt{\frac{1 + \cos 3x}{1 - \cos 3x}} dx =$

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

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

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

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

Answer: C

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89. Evaluate: (i) $\int \frac{1}{\sqrt{1 - \cos 2x}} dx$ (ii) $\int \frac{1}{\sqrt{1 + \cos x}} dx$

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

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

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

D. $\frac{-1}{\sqrt{2}}\log\left[\cot\left(\frac{x}{2}\right)\right]+c$

Answer: D

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90. $\int\frac{1}{\sqrt{1+\cos 5x}}dx=$

A. $\frac{\sqrt{2}}{5}\log(\sin 5x)+c$

B. $\frac{5}{2}\log(\sec x+\tan x)+c$

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

D. $\frac{\sqrt{2}}{5}\log\left(\sec.\frac{5x}{2}+\tan.\frac{5x}{2}\right)+c$

Answer: D

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91. $\int \sqrt{\frac{1 + \sin x}{1 - \sin x}} dx =$

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

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

C. $\log\left[\sin\left(\frac{\pi}{4} - \frac{x}{2}\right)\right] + c$

D. $-\log(1 - \sin x) + c$

Answer: D

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

A. $\frac{2}{3}(1 - \sin x)^{3/2} + c$

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

C. $-\sqrt{2}\log\left[\tan\left(\frac{3\pi}{8} - \frac{x}{4}\right)\right] + c$

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

Answer: C

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93. $\int \frac{\tan(2 + 3\log x)}{x}dx =$

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

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

C. $\frac{1}{3}\log[\sin(2 + 3\log x)] + c$

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

Answer: B

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94. $\int \frac{\sec\sqrt{x}}{\sqrt{x}}dx =$

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

B. $2\log(\sec t + \tan t) + c$

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

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

Answer: C

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95. If $\int \tan^3 x dx = a\log(\sec x) + b\tan^2 x + c$, then $(a, b) \equiv$

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

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

C. $\left(-1, \frac{1}{2}\right)$

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

Answer: C

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96. If $\int \left(\tan^2 x + \tan^4 x\right)dx = \left(\frac{1}{n}\right)\tan^n x + c$, then $n =$

A. 2

B. 3

C. 4

D. 6

Answer: B

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97. If $\int \tan^3 x \sec^3 x dx = \left(\frac{1}{m}\right)\sec^m x - \left(\frac{1}{n}\right)\sec^n x + c$, then $(m, n) \equiv$

A. $(5, 3)$

B. $(3, 5)$

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

D. $(4, 4)$

Answer: A

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98. $\int \frac{\sin(x - a)}{\sin(x + a)} dx =$

A. $x\sin 2a - \cos 2a.\log[\sin(x + a)] + c$

B. $x\cos 2a + \sin 2a.\log[\sin(x + a)] + c$

C. $x\cos 2a - \sin 2a.\log[\sin(x - a)] + c$

D. $x\cos 2a - \sin 2a.\log[\sin(x + a)] + c$

Answer: D

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99. If $\int \frac{\sin x}{\cos(x - a)} dx = kx + n.\log[\sec(x - a)] + p,$ then $(k, n) \equiv$

A. $(-\sin a, \cos a)$

B. $(\cos a, \sin a)$

C. $(\sin a, \cos a)$

D. $(\sin a, -\cos a)$

Answer: C

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100. $\int \frac{\cos(x - a)}{\cos(x - b)} dx =$

A. $x\cos(a - b) + \sin(b - a).\log[\sec(x - b)] + c$

B. $x\sin(a - b) + \cos(a - b).\log[\sec(x - b)] + c$

C. $x\cos(a - b) + \sin(a - b). \log[\sec(x - b)] + c$

D. $x\cos(b - a) + \sin(b - a). \log[\sec(x - b)] + c$

Answer: C

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101. If $\int \frac{k}{\sin(x - a)\sin(x - b)}dx = \log\left[\frac{\sin(x - a)}{\sin(x - b)}\right] + c,$ then $k =$

A. $\sin(a - b)$

B. $\cos(a - b)$

C. $\sin(a + b)$

D. $\cos(a - b)$

Answer: A

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102. If $\int \frac{k}{\cos(x - a)\cos(x - b)} dx = \log\left[\frac{\cos(x - a)}{\cos(x - b)}\right] + c$, then $k =$

A. $\cos(a + b)$

B. $\sin(a - b)$

C. $\cos(a + b)$

D. $\cos(a - b)$

Answer: B

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103. If $\int \frac{k}{\sin(x - a)\cos(x - b)} dx = \log\left[\frac{\sin(x - a)}{\cos(x - b)}\right] + c$, then $k =$

A. $\sin(a - b)$

B. $\cos(a - b)$

C. $\tan(a - b)$

D. $\sec(a - b)$

Answer: B

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104. If $\int \frac{1}{\sin(x - a)\cos(x - a)} dx = \log[f(x)] + c$, then $f(x) =$

A. $\sin(x - a)$

B. $\cos(x - a)$

C. $\tan(x - a)$

D. $\cot(x - a)$

Answer: C

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105. $\int \frac{1}{x^2 + 6x + 10} dx =$

A. $\frac{1}{2}\log\left[\frac{x+3}{x-3}\right] + c$

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

C. $\log\left(x + \sqrt{x+3}\right) + c$

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

Answer: D

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106. If $\int \frac{1}{x^2 - 2\sin\alpha + 1} dx = \sec\alpha . \tan^{-1}(mx + c)$, then

A. $m = \sec\alpha, c \in R$

B. $m = \sec\alpha, c = \tan\alpha$

C. $m = \sec\alpha, c = -\tan\alpha$

D. $m = \tan\alpha, c = \sec\alpha$

Answer: C

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107. $\int \frac{1}{4x^2 + 4x - 15} dx =$

A. $\frac{1}{16}\log\left[\frac{2x - 3}{2x + 5}\right] + c$

B. $\frac{1}{4}\log\left[\frac{2x + 3}{2x - 5}\right] + c$

C. $\frac{1}{4}\log\left[\frac{5+2x}{3-2x}\right]+c$

D. $\frac{1}{4}\tan^{-1}\left[\frac{2x-3}{2x+5}\right]+c$

Answer: A

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108. $\int\frac{1}{5+4x-x^2}dx =$

A. $\frac{1}{6}\log\left[\frac{x-1}{x-5}\right]+c$

B. $\frac{1}{6}\log\left[\frac{x-5}{x-1}\right]+c$

C. $\frac{1}{6}\log\left[\frac{1+x}{x-5}\right]+c$

D. $\frac{1}{6}\tan^{-1}\left[\frac{x-5}{x+1}\right]+c$

Answer: C

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109. If $\int \frac{\cos x}{9 - \cos^2 x} dx = m. \tan^{-1}[m. f(x)] + c$, then

A. $m = 2\sqrt{2}, f(x) = \cos x$

B. $m = \frac{1}{2\sqrt{2}}, f(x) = \sin x$

C. $m = \frac{1}{2}\sqrt{2}, f(x) = \cos x$

D. $m = 2\sqrt{2}, f(x) = \sin x$

Answer: B

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110. $\int \frac{1}{3e^x + 2e^{-x}} dx =$

A. $\dfrac{1}{\sqrt{6}}\tan^{-1}\left[\sqrt{\dfrac{3}{2}}e^{x}\right]+c$

B. $\sqrt{6}\tan^{-1}\left[\dfrac{3e^{x}}{2}\right]+c$

C. $\dfrac{1}{\sqrt{6}}\tan^{-1}\left[\sqrt{\dfrac{2}{3}}e^{x}\right]+c$

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

Answer: A

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111. $\int\dfrac{1}{3+2\cos x}dx=$

A. $\dfrac{2}{5}\tan^{-1}\left[\dfrac{\tan(x/2)}{5}\right]+c$

B. $\dfrac{5}{\sqrt{2}}\tan^{-1}\left[\dfrac{\tan(x/2)}{\sqrt{2}}\right]+c$

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

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

Answer: D

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112. $\displaystyle\int\frac{3}{4-5\sin x}dx=$

A. $\log\left[\dfrac{\tan(x/2)-2}{\tan(x/2)-1}\right]+c$

B. $\log\left[\dfrac{2\tan x-4}{2\tan x-1}\right]+c$

C. $\log\left[\dfrac{2\tan(x/2)-4}{2\tan(x/2)-1}\right]+c$

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

Answer: C

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113. $\int \frac{1}{5 + 3\cos x} dx$

A. $4\log(\tan x + 5) + c$

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

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

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

Answer: D

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114. $\int \frac{20}{16 + 9\sin^2 x} dx =$

A. $\log\left(16 + 9\sin^2 x\right) + c$

B. $\tan^{-1}\left(25 - 9\cos^2 x\right) + c$

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

D. $\frac{4}{3}\tan^{-1}(3\sin x) + c$

Answer: C

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

A. $\frac{1}{2}\log\left[\left(x - \frac{1}{2}\right) - \sqrt{x^2 - x + \frac{3}{4}}\right] + c$

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

C. $\frac{1}{2}\log\left[\left(x + \frac{1}{2}\right) - \sqrt{x^2 + x - \frac{3}{4}}\right] + c$

D. $\frac{1}{2}\tan^{-1}\left(4x^2 - 4x + 3\right) + c$

Answer: B

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116. $\int \frac{1}{\sqrt{7 - 6x - x^2}} dx =$

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

B. $\log\left(x + \sqrt{7 - 6x - x^2}\right) + c$

C. $\frac{1}{8}\log\left(\frac{1 - x}{7 + x}\right) + c$

D. $\log\left(\sqrt{7 - 6x - x^2}\right) + c$

Answer: A

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117. $\int \frac{\sin x}{\sqrt{9 - \sin^2 x}} dx =$

A. $\log\left(\sin x + \sqrt{9 - \sin^2 x}\right) + c$

B. $-\log\left(\cos x - \sqrt{9 - \sin^2 x}\right) + c$

C. $\log\left(\sin x + \sqrt{8 + \cos^2 x}\right) + c$

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

Answer: D

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118. $\int \frac{\cos x}{\sqrt{17 - \cos^2 x}} dx =$

A. $\log\left(\sin x - \sqrt{17 - \cos^2 x}\right) + c$

B. $\log\left(\sin x + \sqrt{16 + \sin^2 x}\right) + c$

C. $\log\left(\sqrt{17 - \cos^2 x} - \sqrt{1 - \cos^2 x}\right) + c$

D. $4\tan^{-1}(2\cos x) + c$

Answer: B

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119. $\int \frac{\sin 2x}{\sqrt{1 - \sin^4 x}} dx =$

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

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

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

D. $\log\left(1 - \sin^4 x\right) + c$

Answer: B

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120. $\int \frac{e^x}{\sqrt{e^{2x} - 1}} dx =$

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

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

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

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

Answer: C

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121. $\int \frac{dx}{\sqrt{e^{2x} - 1}} =$

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

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

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

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

Answer: D

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122. If $\int \frac{3x+2}{2x^2+2x+1}dx = m\log\left(2x^2+2x+1\right) + \frac{1}{2}\tan^{-1}u + c$, then

A. $m = \frac{3}{4}, u = x + \frac{1}{2}$

B. $m = \frac{3}{4}, u = 2x + 1$

C. $m = \frac{4}{3}, u = 2x - 1$

D. $m = -\frac{3}{4}, u = x + \frac{1}{2}$

Answer: B

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123. If $\int \frac{x}{\sqrt{8-2x-x^2}}dx = a\sin^{-1}\left(\frac{x+1}{3}\right) + b\sqrt{8-2x-x^2} + c$,

then

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

B. $a = -2, b = 1$

C. $a = 2, b = -1$

D. $a = 2, b = 1$

Answer: A

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

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

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

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

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

Answer: C

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

A. $3\log\left(x^2+1\right)+c$

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

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

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

Answer: D

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126. If $\int \frac{4\cos x + 3\sin x}{2\sin x + \cos x}dx = ax + b\log(2\sin x + \cos x) + c$, then

A. $a = 2, b = -1$

B. $a = 2, b = 1$

C. $a = b$

D. $a = -2, b = 1$

Answer: B

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127. If $\int \frac{3e^x + 4e^{-x}}{5e^x + 6e^{-x}} = ax + b\log\left(5e^{2x} + 6\right) + c$, then

A. $a = \frac{2}{3}, b = -30$

B. $a = \frac{3}{2}, b = \frac{-1}{30}$

C. $a = \frac{2}{3}, b = \frac{-1}{30}$

D. $a = -\frac{3}{2}, b = -30$

Answer: C

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128. $\int \frac{1}{1 + \tan x} dx$

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

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

C. $x + \log\left[\tan\left(\frac{\pi}{4} + \frac{x}{2}\right)\right] + c$

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

Answer: D

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129. If $\int(x+1)\sqrt{2x-1}dx = a(2x-1)^{5/2} + b(2x-1)^{3/2} + c$, then $\frac{b}{a} =$

A. 6

B. 5

C. 4

D. 3

Answer: B

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130. If $\int \frac{1}{\sqrt{1-2x}}dx = a(1-2x)^{3/2} + b\sqrt{1-2x} + c$, then $\frac{b}{a} =$

A. -3

B. -2

C. 3

D. 2

Answer: A

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131. $\int \frac{1}{(x+1)\sqrt{x-1}}dx =$

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

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

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

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

Answer: B

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132. $\int \frac{1}{x^2-2x-3}dx =$

A. $4\log[(x-3)(x+1)]+c$

B. $\frac{1}{4}\log\left[\frac{x+1}{x-3}\right]+c$

C. $\frac{1}{4}\log\left[\frac{x-3}{x+1}\right]+c$

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

Answer: C

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133. If $\int \frac{5x+2}{x^2-3x+2}dx = \log\left[(x-2)^m.(x-1)^n\right] + c$ then $(m, n) \equiv$

A. $(12, -7)$

B. $(-12, 7)$

C. $(12, 7)$

D. $(-7, 12)$

Answer: A

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134. If $\int \frac{x+1}{x\left(x^2-4\right)}dx = \log\left[(x-2)^{m/8}.x^{n/4}.(x+2)^{p/8}\right] + c$, then

$(m, n, p) \equiv$

A. $(3, -1, 1)$

B. $(3, -1, -1)$

C. $(1, -3, -1)$

D. $(-3, 1, -1)$

Answer: B

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135. If $\int \frac{x^2+37}{x^4-3x^2-28}dx = a\log\left(\frac{x-\sqrt{7}}{x+\sqrt{7}}\right) + b\tan^{-1}\left(\frac{x}{2}\right) + c,$ then $(a, b) \equiv$

A. $\left(\frac{2}{\sqrt{7}}, \frac{2}{3}\right)$

B. $\left(\frac{\sqrt{7}}{2}, \frac{3}{2}\right)$

C. $\left(\frac{\sqrt{7}}{2}, \frac{-3}{2}\right)$

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

Answer: D

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136. $\int e^x[f(x) + f'(x)]dx =$

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

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

C. $x . f(x) + c$

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

Answer: A

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137. $\int e^x(x + 100)dx =$

A. $100e^x + c$

B. $xe^x + 100 + c$

C. $(x + 99)e^x + c$

D. $101xe^x + c$

Answer: C

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138. $\int e^x\left(1 + \tan x + \tan^2 x\right)dx =$

A. $e^x. \sec^2 x + c$

B. e^x. sec$x + c$

C. e^x. tan$^2x + c$

D. e^x. tan$x + c$

Answer: D

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139. $\int e^x\left(1 - \cot x + \cot^2 x\right)dx =$

A. e^{-x}. cot$x + c$

B. $-e^x$. cot$x + c$

C. e^x. cos$x + c$

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

Answer: B

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

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

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

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

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

Answer: A

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

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

B. e^x. $\operatorname{cosec} x + c$

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

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

Answer: B

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142. Evaluate: $\int e^x \left(\frac{2 + \sin 2x}{1 + \cos 2x}\right) dx$

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

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

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

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

Answer: C

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143. $\int e^x \frac{2 - \sin 2x}{1 - \cos 2x} dx$

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

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

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

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

Answer: D

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144. $\int e^x\left(\frac{1+\sin x}{1+\cos x}\right)dx = ?$

A. $e^{x/2}.\tan x + c$

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

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

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

Answer: B

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145. $\int e^x\frac{1-\sin x}{1-\cos x}dx =$

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

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

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

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

Answer: C

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

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

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

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

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

Answer: C

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147. $\int\left\{\frac{1}{(\log x)}-\frac{1}{(\log x)^2}\right\}dx = ?$

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

B. $x.\log x + c$

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

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

Answer: D

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148. $\int \frac{xe^x}{(1+x)^2} dx$

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

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

C. $e^x.(1+x)^{-3}+c$

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

Answer: A

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149. If $\int e^x\left(\frac{1-x}{1+x^2}\right)^2 dx = e^x f(x)+c,$ then $f(x)=$

A. $1+x^2$

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

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

D. $1+x^2$

Answer: B

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150. If $\int e^x \frac{1+x^2}{(1+x)^2} dx = e^x f(x) + c$, then $f(x) =$

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

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

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

D. $\frac{x+1}{x-1}$

Answer: A

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151. $\int[f(x) + xf'(x)]dx =$

A. $x. f(x) + c$

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

C. $\dfrac{x}{f(x)} + c$

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

Answer: A

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152. $\int \frac{x + \sin x}{1 + \cos x} dx$ is equal to

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

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

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

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

Answer: C

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153. If $\int \left(u\frac{dv}{dx}\right)dx = uv - \int w dx,$ then $w =$

A. $\frac{du}{dx}\frac{dv}{dx}$

B. $v\frac{du}{dx}$

C. $\frac{d}{dx}(uv)$

D. uv

Answer: B

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154. $\int x\sin x dx =$

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

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

C. $1 - \cos x + c$

D. does not exist

Answer: A

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

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

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

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

D. does not exist

Answer: B

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156. $\int x\tan x dx =$

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

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

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

D. does not exist

Answer: D

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157. $\int x\tan^2 x dx =$

A. does not exist

B. $x\tan x - \log(\cos x) + c$

C. $x\tan x - \log(\sec x) - \frac{x^2}{2} + c$

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

Answer: C

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158. $\int \frac{x}{1 + \cos 2x} dx$

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

B. $x\tan x - \log(\sec x) + c$

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

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

Answer: B

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159. If $\int \frac{x}{1 + \sin x} dx = \log u - x(\sec x - \tan x) + c$, then $u =$

A. $\dfrac{1}{1 + \sin x}$

B. $\dfrac{1}{1 - \sin x}$

C. $1 - \sin x$

D. $1 + \sin x$

Answer: D

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160. If $\int x^2 \sin x dx = \left(2 - x^2\right)u + 2vx + c$, then

A. $u = -\sin x, v = \cos x$

B. $u = -\cos x, v = \sin x$

C. $u = \cos x, v = \sin x$

D. $u = -\sin x, v = -\cos x$

Answer: C

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161. If $\int x^3 . e^{-x} dx = -e^{-x} . f(x) + c$, then $f(x) =$

A. $x^3 - 3x^2 + 6x - 6$

B. $-x^3 + 3x^2 - 6x + 6$

C. $x^3 - 3x^2 + 6x + 6$

D. $x^3 + 3x^2 + 6x + 6$

Answer: D

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162. if $\int x\tan^{-1}x dx = u\tan^{-1}x - \frac{x}{2} + c$ then $u =$

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

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

C. $1 - x^2$

D. $x^2 + 1$

Answer: B

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

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

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

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

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

Answer: A

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164. If $\int x^2 . e^{x^3} dx = u . e^{x^3} + c$, then $u =$

A. $\frac{x^3}{3}$

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

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

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

Answer: D

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

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

B. $x\log\left(\frac{x}{e}\right) + c$

C. $x\log\left(\frac{e}{x}\right) + c$

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

Answer: B

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166. $\int (\log x)^2 dx = ux + c$, then $u =$

A. 2

B. $(\log x)^2 - 2\log x - 2$

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

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

Answer: C

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167. If $\int \sin^{-1} x dx = x\sin^{-1} x + u + c,$ then $u =$

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

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

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

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

Answer: A

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168. if $\int e^{\sqrt{x}}dx = 2ue^{\sqrt{x}} + c$ then u

A. $\sqrt{x}$ - 1

B. $\sqrt{x} + 1$

C. 1 - $\sqrt{x}$

D. $2\sqrt{x} + 1$

Answer: A

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169. $\int \sin\sqrt{x}dx =$

A. $2\left[\cos\sqrt{x} - \sqrt{x}\sin\sqrt{x}\right] + c$

B. $2\left[\sin\sqrt{x} + \cos\sqrt{x}\right] + c$

C. $2\left[\sin\sqrt{x} + \sqrt{x}\cos x\right] + c$

D. $2\left[\sin\sqrt{x} - \sqrt{x}\cos\sqrt{x}\right] + c$

Answer: D

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170. If $\int \tan^{-1}\sqrt{x}dx = u\tan^{-1}\sqrt{x} - \sqrt{x} + c$, then $u =$

A. $x - 1$

B. $1 - x$

C. $1 + x$

D. $2\sqrt{x} - 1$

Answer: C

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

A. $\sin x + \cos x$

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

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

D. -$(\sin x + \cos x)$

Answer: B

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172. $\int \sec^3 x dx = ?$

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

B. $\cos x . \cot x - \log(\cos x - \cot x) + c$

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

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

Answer: A

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173. If $\int e^{\sin x} . \sin 2x dx = -2u . e^{\sin x} + c$, then $u =$

A. $1 + \sin x$

B. $1 + \cos x$

C. $1 - \sin x$

D. $1 - \cos x$

Answer: C

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174. if $\int e^{2x}\sin x\cos x dx = \frac{u}{8}e^{2x} + c$ then u

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

B. $\sin 2x$ - $\cos 2x$

C. $\sin 2x + \cos 2x$

D. $\cos 2x$ - $\sin 2x$

Answer: B

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

A. $\frac{x - 1}{2}\sqrt{8 + 2x - x^2} + c$

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

C. $\frac{x - 1}{2}\sqrt{8 + 2x - x^2} + \frac{9}{2}\sin^{-1}\left(\frac{x - 1}{3}\right) + c$

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

Answer: C

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MULTIPLE CHOICE QUESTIONS(PART - B : Mastering The BEST)

1. Jack says that $\int 2\sin x\cos x dx$ equals $' - \cos^2 x + c'$ while Jill claims that it is $'\sin^2 x + c'$. Who is right?

A. Jack

B. Jill

C. both

D. none of them

Answer: C

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

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

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

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

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

Answer: B

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3. If $\int \frac{2x + 5}{5x + 1} dx = ax + b\log(5x + 1) + c$, then $(a, b) \equiv$

A. $\left(\frac{2}{5}, \frac{23}{25}\right)$

B. $\left(\frac{5}{2}, \frac{23}{2}\right)$

C. $\left(\frac{-2}{5}, \frac{2}{23}\right)$

D. $\left(\frac{2}{5}, -\frac{2}{23}\right)$

Answer: A

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

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

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

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

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

Answer: C

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5. $\int \frac{2e^x}{3+4e^x} dx =$

A. none of the following

B. $0.25\log\left(3+4e^x\right) + c$

C. $0.50\log\left(3+4e^{x}\right)+c$

D. $0.75\log\left(3+4e^{x}\right)+c$

Answer: C

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

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

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

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

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

Answer: D

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7. $\int \frac{dx}{\sqrt{e^{2x} - 1}} =$

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

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

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

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

Answer: C

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

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

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

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

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

Answer: B

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

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

B. $e.\frac{1}{x}+c$

C. $\log\left(e^{x}+e^{x}\right)+c$

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

Answer: D

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10. $\int \frac{\tan^{-1}x}{1+x^2}dx =$

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

B. $-\log(\tan x)+c$

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

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

Answer: C

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11. $\int \frac{ae^{x} + be^{-x}}{\left(ae^{x} - be^{-x}\right)} dx =$

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

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

C. $\log\left(ae^{x} - be^{-x}\right) + c$

D. $\log\left(ae^{x} + be^{-x}\right) + c$

Answer: A

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12. $\int \frac{3^{1/x}}{x^{2}} dx =$

A. $\frac{3^{1/x}}{\log_{3}e} + c$

B. $\dfrac{-3^{1/x}}{\log 3} + c$

C. $3^{-1/x}\log 3 + c$

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

Answer: B

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13. $\int \dfrac{a^x + b^x}{a^x b^x} dx =$

A. $\dfrac{a^{-x}}{\log a} + \dfrac{b^{-x}}{\log b} + c$

B. $\dfrac{b^{-x}}{\log b} - \dfrac{a^{-x}}{\log a} + c$

C. $\dfrac{-a^{-x}}{\log a} - \dfrac{b^{-x}}{\log b} + c$

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

Answer: C

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14. Evaluate: (i) $\int \frac{2^x + 3^x}{5^x} dx$ (ii) $\int \frac{\left(a^x + b^x\right)^2}{a^x b^x} dx$

A. $\dfrac{\left(\frac{a}{b}\right)^x - \left(\frac{b}{a}\right)^x}{\log a - \log b} + c$

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

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

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

Answer: B

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15. $\int 2^{3x}.3^{x}dx =$

A. $2^{3x}.3^{2x}.\ (\log 2)(\log 3) + c$

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

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

D. $2^{3x}.3^{2x}.\ \log_{72} e + c$

Answer: D

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16. $\int \frac{2^{x}3^{x}}{1 + (36)^{x}}dx =$

A. $\dfrac{\tan^{-1}(6^x)}{\log 6} + c$

B. $\dfrac{1}{12}\log\left(\dfrac{1+6^x}{1-6^x}\right) + c$

C. $\dfrac{1}{12}\log\left(\dfrac{6^x-1}{6^x+1}\right) + c$

D. $\dfrac{1}{12}\tan^{-1}\left(\dfrac{6^x}{\log 6}\right) + c$

Answer: A

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17. $\int \dfrac{\sqrt{x}}{1+x\sqrt{x}}dx$ -

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

B. $\dfrac{3}{2}\log x + c$

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

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

Answer: C

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

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

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

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

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

Answer: B

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

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

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

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

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

Answer: D

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20. $\int e^{x+e^x}dx =$

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

B. $e^{x^{2}} + c$

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

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

Answer: C

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21. $\int e^{-\log x} dx$ is equal to

A. $\dfrac{e^{\log x}}{x} + c$

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

C. $\log x + c$

D. $-\log x + c$

Answer: B

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22. $\int e^{-\log x}dx$ is equal to

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

B. $\log x+c$

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

D. $-\log x+c$

Answer: B

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23. $\int e^{2x^2+\log x}dx =$

A. $\frac{1}{4}e^{2x^2}+c$

B. $\frac{1}{4}e^{4x}+c$

C. $e^{4x+\frac{1}{x}}+c$

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

Answer: A

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

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

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

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

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

Answer: C

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25. The value of the integral $\int \frac{\log(x+1) - \log x}{x(x+1)} dx$ is

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

B. $\log[\log(x+1)] - \log(\log x) + x$

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

D. $e^x\left[\frac{1}{x} - \frac{1}{x+1}\right] + c$

Answer: C

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26. $\int \frac{\log x}{x} dx = ?$

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

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

C. $2\log x + c$

D. $\log x + c$

Answer: B

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

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

B. $3\log x + c$

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

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

Answer: D

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28. $\int \frac{\log x}{x^2} dx = ?$

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

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

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

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

Answer: C

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29. $\int \frac{1}{x}\log\left(\frac{1}{x}\right)dx =$

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

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

C. $2\log x + c$

D. $-\log x + c$

Answer: B

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30. Evaluate the following integrals:

$$\int \frac{\log(\log x)}{x}dx$$

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

B. $t(\log t - 1) + c$

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

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

Answer: A

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31. If $\int \sin^4 x \cos^3 x dx = \dfrac{1}{m}\sin^m x - \dfrac{1}{n}\sin^n x + c$ then $(m, n) \equiv$

A. $(5, 7)$

B. $(7, -5)$

C. $(-5, 7)$

D. $(5, 4)$

Answer: A

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32. $\int \frac{\sin^3 x}{\cos^5 x} dx$

A. $3\sec^2 x \tan^2 x + c$

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

C. $\frac{1}{4}\tan^4 x + c$

D. $\frac{1}{3}\tan 4x + c$

Answer: C

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33. $\int \frac{\cos^2 x}{\sin^4 x} =$

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

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

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

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

Answer: B

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34. $\int \frac{1}{\sqrt{\sin x \cos^3 x}} dx =$

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

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

C. $\dfrac{\sec^2 x}{2\sqrt{\tan x}} + c$

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

Answer: D

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35. $\int \dfrac{\sqrt{\tan x}}{\sin 2x} dx =$

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

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

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

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

Answer: B

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36. $\int \tan x \sqrt{\sec x} dx =$

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

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

C. $2\sqrt{\sec x} + c$

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

Answer: C

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37. $\int \frac{\cos 2x}{\cos x} dx =$

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

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

C. $\log(\sec x + \tan x) + 2\cos x + c$

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

Answer: B

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38. $\int \frac{\cos 2x}{\cos x} dx =$

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

B. $2\sin x + \log(\cos x + \cot x) + c$

C. $2\cos x - \log(\cos x - \cot x) + c$

D. $2\cos x - \log(\cos x - \cot x) + c$

Answer: A

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

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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40. $\int \frac{\sin x}{\sqrt{\cos 2x}} dx =$

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

B. $\frac{-1}{\sqrt{2}}\log\left[\sqrt{2}\cos x + \sqrt{2\sin^2 x - 1}\right] + c$

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

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

Answer: A

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

A. $\frac{-1}{\sqrt{2}}\log\left[\sqrt{2}\sin x + \sqrt{\cos 2x}\right] + c$

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

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

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

Answer: D

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42. $\int \frac{1}{\sec x+\tan x}dx=$

A. $\frac{1}{\sec}+c$

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

C. $\cos x+\log(\cos x-\cot x)+c$

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

Answer: C

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

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

B. $2\cos 2x + c$

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

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

Answer: D

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44. $\int \frac{1}{\sin x \sin 2x} dx =$

A. $\frac{1}{2}[\log(\sec x + \tan x) - \cos x] + c$

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

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

D. $\frac{1}{2}[\log(\cos x - \cot x) + \sec x] + c$

Answer: A

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

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

B. $\log\left[\sqrt{\frac{2 + \tan x}{\tan x}}\right] + c$

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

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

Answer: A

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46. $\int \frac{\sec x \operatorname{cosec} x}{\tan^2 x} dx =$

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

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

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

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

Answer: C

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47. $\int \frac{\sec x \operatorname{cosec} x}{\log(\tan x)} dx =$

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

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

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

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

Answer: B

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48. $\int \frac{\sec x}{\sin x + \cos x} dx =$

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

B. $\log(1 + \tan x) + c$

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

D. $\log(1 - \cot x) + c$

Answer: B

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49. $\int \frac{\cos x}{\sin x + \cos x} dx =$

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

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

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

D. $-\log(1 + \cot x) + c$

Answer: D

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50. $\int \frac{1}{\cos x + \sec x} dx =$

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

B. $\frac{-1}{2\sqrt{2}} \log\left[\frac{\sqrt{2} - \sin x}{\sqrt{2} + \sin x}\right] + c$

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

D. $\frac{1}{2\sqrt{2}} \tan^{-1}\left[\frac{\sin x}{\sqrt{2}}\right] + c$

Answer: A

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51. $\int \left(\cos x - \cos^2 x\right) dx =$

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

B. $\sin 2x - \cos x + c$

C. $\log(\sec x + \tan x) - \cot\left(\frac{x}{2}\right) + c$

D. $\cos 2x - \sin x + c$

Answer: C

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52. $\int \frac{x\cos x}{x\sin x + \cos x} dx =$

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

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

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

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

Answer: D

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53. $\int\left(\tan^2 x - \cot^2 x\right)dx =$

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

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

C. $-\tan x - \cot x + 4x + c$

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

Answer: A

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54. $\int(\tan x - \cot x)^2 dx =$

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

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

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

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

Answer: B

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55. Evaluate the following integrals.

$$\int \frac{1}{1 - \cos x} dx$$

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

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

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

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

Answer: A

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56. $4\int \frac{1 + \sin^2 2x}{1 + \cos 4x} dx =$

A. $2\tan 2x - 4x + c$

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

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

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

Answer: B

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57. $\int \frac{4\cos^2 x - 3\sin^2 x}{\sin^2 2x} d(4x) =$

A. $4\cot x + 3\tan x + c$

B. $4\cot x - 3\tan x + c$

C. $-4\cot x - 3\tan x + c$

D. $-4\cot x + 3\tan x + c$

Answer: C

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

A. $\cos x - 3\sec x + c$

B. $\cos x + 3\sec x + c$

C. $3\sec x - \cos x + c$

D. $-3\sec x - \cos x + c$

Answer: C

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59. Evaluate $\int \frac{\sec x}{(\sec x + \tan x)} dx.$

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

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

C. $\dfrac{3}{\sec x + \tan x} + c$

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

Answer: A

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

A. $2x + \sin x - \cos x + c$

B. $2x - \sin x + \cos x + c$

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

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

Answer: B

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61. Evaluate the following integrals : $\int \frac{1 - \cos 2x}{1 + \cos 2x} dx$

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

B. $\tan x - x + c$

C. $\tan x + x + c$

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

Answer: B

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

A. $-\cot x - \frac{x}{2} + c$

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

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

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

Answer: A

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63. $2\int \frac{1 + \cos^2 x}{1 + \cos 2x} dx =$

A. $x - \cot x + c$

B. $\tan x - x + c$

C. $x + \cot x + c$

D. $x + \tan x + c$

Answer: D

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

A. $-\cot x + b\cos x + c$

B. $a\cot x + b\cos x + c$

C. $-a\cot x - b\cos x + c$

D. $\log(a + b\cos x) + c$

Answer: C

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

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

B. $\frac{x}{2} - \int \cos^2 x dx + c$

C. $-\frac{x}{2} + \int \cos^2 x dx + c$

D. $-\frac{x}{2} - \int \cos^2 x dx + c$

Answer: B

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66. $\int \frac{1}{\sin x - \cos x} dx =$

A. $\frac{1}{\sqrt{2}} \log\left[\tan\left(\frac{\pi}{4} - \frac{x}{8}\right)\right] + c$

B. $\frac{1}{\sqrt{2}} \log\left[\cot\left(\frac{\pi}{4} - \frac{x}{8}\right)\right] + c$

C. $\frac{1}{\sqrt{2}}\tan\left(\frac{x}{2}-\frac{\pi}{8}\right)+c$

D. $\frac{1}{\sqrt{2}}\log\left[\tan\left(\frac{x}{2}-\frac{\pi}{8}\right)\right]+c$

Answer: D

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67. $\int\frac{1}{\sin x\cdot\cos^2 x}dx=$

A. $\log\left[\tan\left(\frac{x}{2}\right)\right]-\sec x+c$

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

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

D. $\log\left[\cot\left(\frac{x}{2}\right)\right]+\sec x+c$

Answer: B

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

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

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

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

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

Answer: C

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

A. $\frac{\tan^{m+1}}{m+1} + c$

B. $\frac{\tan^m x}{m} + c$

C. $\tan^m x + c$

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

Answer: A

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70. $\int \frac{\tan^m x}{\sin x \cos x} dx =$

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

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

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

D. $\dfrac{\tan^{m}x}{m} + c$

Answer: D

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71. $\int \dfrac{x^3\left[\tan^{-1}\left(x^4\right)\right]^2}{1+x^8}dx =$

A. $\dfrac{\left[\tan^{-1}\left(x^4\right)\right]^2}{12} + c$

B. $\dfrac{\tan^{-1}x}{4} + c$

C. $\dfrac{\left[\tan^{-1}\left(x^4\right)\right]^3}{4} + c$

D. $\dfrac{\left[\tan^{-1}\left(x^4\right)\right]^3}{12} + c$

Answer: D

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

A. $2\log x + c$

B. $\log x + c$

C. $-\log x + c$

D. $-2\log x + c$

Answer: A

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

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

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

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

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

Answer: B

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74. $4\int\left(\sec^2 x\tan^3 x + \mathrm{cosec}^2 x\cot^3 x\right)dx =$

A. $\tan^4 x + \cot^4 x + c$

B. $\tan^4 x - \cot^4 x + c$

C. $-\tan^4 x - \cot^4 x + c$

D. $\sin^4 x - \cot^4 x + c$

Answer: B

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75. $\int \sin x \cos x \frac{\sec^4 x}{1 + \sec^4 x} dx =$

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

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

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

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

Answer: B

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76. $\int \frac{\sin 4x}{1+\sin^4 2x}dx =$

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

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

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

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

Answer: B

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

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

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

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

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

Answer: D

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78. $\int \frac{1 + \sin x}{(x - \cos x)^3} dx =$

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

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

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

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

Answer: A

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79. $\int \sec x \operatorname{cosec} x \log(\tan x) dx =$

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

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

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

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

Answer: B

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

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

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

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

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

Answer: C

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81. $\int \frac{\tan x}{\log(\cos x)} dx =$

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

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

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

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

Answer: C

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82. $\int \frac{1 + \cot x}{1 - \cot x} dx =$

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

B. $\log(\sin x) + \log(1 - \cot x) + c$

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

D. $\log(1 + \cot x) + c$

Answer: B

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

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

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

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

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

Answer: C

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84. $\int \frac{\cot x}{1 + \sin x} dx =$

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

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

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

D. $\log(1 + \sin x) + c$

Answer: B

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85. $\int \frac{1}{\sin 2x - \sin^2 x} dx =$

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

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

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

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

Answer: B

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86. $\int \frac{1}{1 + \sin x + \cos x} dx =$

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

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

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

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

Answer: B

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87. $\int \frac{1}{3\cos x + 4\sin x} dx =$

A. $\frac{-1}{5}\log\left[\frac{3\tan.\frac{x}{2+1}}{9-3\tan.\frac{x}{2}}\right]+c$

B. $\frac{1}{5}\log\left[\frac{9-3\tan.\frac{x}{2}}{3\tan.\frac{x}{2}+1}\right]+c$

C. $\frac{1}{5}\log\left[\frac{3\tan.\frac{x}{2}+1}{9-3\tan.\frac{x}{2}}\right]+c$

D. $\frac{1}{5}\tan^{-1}\left[\frac{1}{9}\tan.\frac{x}{2}\right]+c$

Answer: C

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

A. $\dfrac{1}{2\sqrt{2}}\log\left[\dfrac{\sqrt{2}-1+\tan x}{\sqrt{2}+1-\tan x}\right]+c$

B. $\dfrac{1}{2\sqrt{2}}\log\left[\dfrac{\sqrt{2}+1+\tan x}{\sqrt{2}}\right]+c$

C. $\dfrac{1}{\sqrt{2}}\log\left[\dfrac{\sqrt{2}-1+\tan x}{\sqrt{2}+1-\tan x}\right]+c$

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

Answer: A

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89. $\displaystyle\int\frac{1}{1-\sin 2x}dx=$

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

B. $\dfrac{\cot x}{\cot x-1}+c$

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

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

Answer: B

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90. $\int \dfrac{1}{2 + \cos 2x} dx =$

A. $\dfrac{1}{3\sqrt{2}} \log\left[\dfrac{\sqrt{3} + \tan x}{\sqrt{3} - \tan x}\right] + c$

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

C. $\dfrac{1}{\sqrt{3}} \tan^{-1}\left(\dfrac{1}{\sqrt{3}} \tan x\right)$

D. $\dfrac{1}{2\sqrt{3}} \log\left[\dfrac{\sqrt{3}\tan x}{1 + \tan x}\right] + c$

Answer: C

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

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

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

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

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

Answer: A

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

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

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

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

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

Answer: B

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93. $\int \frac{1}{16\sin^2 x + 25\cos^2 x} dx =$

A. $\frac{1}{20}\tan^{-1}\left(\frac{4}{5}\tan x\right) + c$

B. $\frac{-1}{20}\tan^{-1}\left(\frac{4}{5}\tan x\right) + c$

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

D. $\frac{1}{20}\log\left[4\sin x + \sqrt{16\sin^2 x + 25\cos^2 x}\right] + c$

Answer: A

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94. $\int \frac{1}{\sqrt{\cos^4 x - \cos^2 x \sin^2 x}} dx =$

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

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

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

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

Answer: D

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95. $\int \frac{1}{\sqrt{\sin^2 x\cos^2 x - \sin^4 x}} dx =$

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

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

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

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

Answer: C

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

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

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

Answer: D

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97. $\int \frac{1}{\sqrt{\operatorname{cosec}^2 x + \cot^2 x}} dx =$

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

Answer: B

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98. $\int \frac{\sin x}{\sin(x - a)} dx - \int \frac{\cos x}{\cos(x - a)} dx =$

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

B. $2\sin a \log[\tan(x - a)] + c$

C. $2\log[\tan(x - a)] + c$

D. $2\cos a \log[\sec(x - a)] + c$

Answer: B

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99. $\int \frac{1}{\sin x \sin(x+a)} dx =$

A. $\cos a \log\left[\frac{\sin x}{\sin(x+a)}\right] + c$

B. $\cos a \log\left[\frac{\sin x}{\sin(x+a)}\right] + c$

C. $\cos x a \log\left[\frac{\sec(x+a)}{\sec x}\right] + c$

D. $\cos a \log\left[\frac{\sec x}{\sec(x+a)}\right] + c$

Answer: B

View Text Solution

100. $\int \frac{1}{x^2 + (a+b)x + ab} dx =$

A. $\frac{1}{b-a} \log\left[\frac{x+b}{x+a}\right] + c$

B. $\frac{1}{b-a}\log\left[\frac{x+a}{x+b}\right]+c$

C. $\frac{1}{ab}\tan^{-1}\left[\frac{ax}{b}\right]+c$

D. $\frac{1}{ab}\tan^{-1}\left[\frac{bx}{a}\right]+c$

Answer: B

View Text Solution

101. $\int\frac{1}{x^4+\left(a^2+b^2\right)x^2+a^2b^2}dx=$

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

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

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

D. $2x\left[\log\left(x^2+a^2\right)-\log\left(x^2+b^2\right)\right]+c$

Answer: C

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102. $\int \frac{1}{x^3(1-x)} dx =$

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

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

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

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

Answer: A

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

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

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

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

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

Answer: C

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

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

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

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

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

Answer: B

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

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

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

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

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

Answer: C

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106. If $\int \frac{x^2 + a^2}{x + a}dx = \frac{(x + a)^2}{2} + hx + k\log(x + a) + c,$ then $2ah + k =$

A. a^2

B. $2a^2$

C. $-2a^2$

D. 0

Answer: D

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

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

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

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

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

Answer: A

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

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

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

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

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

Answer: B

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109. $\int \frac{1}{x^2 - x^3}dx =$

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

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

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

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

Answer: D

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110. $\int \frac{1}{x^3-x^4}dx=$

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

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

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

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

Answer: C

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111. $\int \frac{x^8}{x^6+1}dx =$

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

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

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

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

Answer: B

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

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

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

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

D. $x + \log\left(1 + e^x\right) + c$

Answer: C

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113. $\int \dfrac{e^{2x} + e^{-2x}}{e^x + e^{-x}} dx =$

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

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

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

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

Answer: A

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114. $\int \frac{1}{\left(1+e^{mx}\right)\left(1+e^{-mx}\right)}dx =$

A. $\frac{m}{1+e^{mx}} + c$

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

C. $\frac{1}{1+e^{mx}} + c$

D. $\frac{-1}{m\left(1+e^{mx}\right)} + c$

Answer: D

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115. $\int \frac{1}{\left(e^{-mx}\right)^2} dx =$

A. $\frac{1}{1+e^{2mx}} + c$

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

C. $\frac{1}{m\left(1+e^{2mx}\right)} + c$

D. $\frac{2m}{e^{2mx} + e^{-2mx}} + c$

Answer: B

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116. If $I_n = \int x^n e^x dx$, then $I_5 + 5I_4 =$

A. $4x^4e^x + c$

B. $5x^4e^x + c$

C. $x^5e^x + c$

D. $3I_6$

Answer: C

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117. If $I_n = \int \frac{\sin nx}{\sin x} dx$, then $I_5 - I_3 =$

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

B. $\sin 4x + c$

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

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

Answer: C

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118. If $I_n = \int \frac{\sin nx}{\cos x} dx$, then $I_7 + I_5 =$

A. $-\frac{\cos 6x}{3} + c$

B. $\frac{\cos 6x}{3} + c$

C. $\cos 6x + c$

D. $-\cos 6x + c$

Answer: A

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119. If $f(x) = \begin{vmatrix} \sin^2 x & \cos^2 x & 1 \\ \cos^2 x & \sin^2 x & 1 \\ -10 & 12 & 2 \end{vmatrix}$, then $\int f(x)dx =$

A. any real c

B. $x + c$

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

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

Answer: A

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120. If $\int \frac{\cos 4x + 1}{\cot x - \tan x} dx = a\cos 4x + c$, then $a =$

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

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

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

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

Answer: B

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121. $\int \frac{1}{1 - \cos x \sin x} dx =$

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

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

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

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

Answer: C

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122. $\int \frac{1}{7+5\cos x}dx =$

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

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

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

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

Answer: B

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123. $\int \frac{3^x}{\sqrt{9^x - 1}} dx =$

A. $\log_3\left(3^x + \sqrt{9^x - 1}\right) + c$

B. $\log_3\left(3^x - \sqrt{9^x - 1}\right) + c$

C. $\log_9\left(3^x + \sqrt{9^x - 1}\right) + c$

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

Answer: A

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124. Evaluate the following integrals:

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

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

B. $\dfrac{\log x}{1 + \log x} + c$

C. $\dfrac{x - 1}{1 + \log x} + c$

D. $\dfrac{x}{1 + \log x} + c$

Answer: D

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125. If $I_n = \int \cos^n x dx$, then $(n + 1)I_{n+1} - nI_{n-1} =$

A. $\sin x$

B. $\sin x \cos^n x$

C. $\sin x \cos^{n-1} x$

D. $\sin x \cos^{n-2} x$

Answer: B

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126. $\int \frac{e^x}{x+2}[1+(x+2)\log(x+2)]dx =$

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

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

C. $e^x[1+\log(x+2)]+c$

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

Answer: B

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

A. $\dfrac{\tan 7x}{7} + c$

B. $\dfrac{\tan^7 x}{7} + c$

C. $\tan^7 x + c$

D. $\sec^7 x + c$

Answer: B

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128. $\int \dfrac{1}{x(1 + \log x)^3} + c$

A. $\dfrac{1}{2(1 + \log x)^2} + c$

B. $\dfrac{1}{1 + \log x} + c$

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

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

Answer: A

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129. $\int \frac{3}{2x^2 - x - 1} dx =$

A. $\log\left[\frac{x - 1}{x + 1}\right] + c$

B. $\log\left[\frac{x + 1}{2x + 1}\right] + c$

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

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

Answer: D

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

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

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

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

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

Answer: C

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131. $\int \frac{e^x(1 + x\log x)}{x} dx =$

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

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

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

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

Answer: C

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132. $\int \frac{1}{\sqrt{x}(x+9)}dx =$

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

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

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

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

Answer: B

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133. $\int \sec^2 x \cos^3 x dx =$

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

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

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

D. $\frac{\tan^3 x}{3} - \frac{\sin^5 x}{5} + c$

Answer: A

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134. $\int \frac{\sin x}{(\sin x - \cos x)} dx = ?$

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

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

C. $\dfrac{\sin x - \cos x}{x} + c$

D. $\sin 2x - \cos 2x + c$

Answer: A

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135. $\int \dfrac{1}{x(1 - \log x)^2} dx =$

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

B. $\dfrac{1}{x(1 - \log x)} + c$

C. $\dfrac{-x}{1 - \log x} + c$

D. none of these

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136. $\int \frac{x-1}{(x+1)^3} e^x dx =$

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

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

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

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

Answer: A

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137. $\int \sin 2x d(\tan x) =$

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

B. $2\log(\sec x) + c$

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

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

Answer: B

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138. $\int \frac{e^{-x}}{1+e^{x}}dx =$

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

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

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

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

Answer: C

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139. If $\int \tan^4 x dx = a\tan^3 x + b\tan x + u + c,$ then

A. $a = \frac{1}{3}, b = -1, u = x$

B. $a = 1, b = -1, u = -x$

C. $a = -1, b = 1, u = 2x$

D. $a = \frac{1}{2}, b = \frac{1}{3}, u = 3x$

Answer: A

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140. $\int \frac{1}{(x-1)\sqrt{x^2-1}} dx$ equals

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

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

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

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

Answer: D

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141. $\int \frac{d(\cos x)}{\sqrt{1-\cos^2 x}} =$

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

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

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

D. $-x + c$

Answer: D

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142. $\int \frac{\log(x/e)}{(\log x)^2} dx =$

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

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

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

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

Answer: C

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

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

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

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

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

Answer: A

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144. $\int \frac{3 + 2\cos x}{(2 + 3\cos x)^2} dx$ is equal to

A. $\dfrac{\sin x}{2+3\cos x}+c$

B. $\dfrac{\cos x}{2+3\sin x}+c$

C. $\dfrac{2\cos x}{2+3\cos x}+c$

D. $\dfrac{2\sin x}{2+3\sin x}+c$

Answer: A

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145. If $\int \dfrac{\sqrt{\cot x}}{\sin x\cos x}dx = a\sqrt{\cot x}+b$, then

A. $a=1, b=-2$

B. $a=2, b=1$

C. $a=-1, b\varepsilon R$

D. $a=-2, b\varepsilon R$

Answer: D

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146. If $\int \frac{x + \left(\cos^{-1} 3x\right)^2}{\sqrt{1 - 9x^2}} dx = A\sqrt{1 - 9x^2} + B\left(\cos^{-1} 3x\right)^3 + C,$ then

A-B is

A. $a = -\frac{1}{9}, b = \frac{1}{9}$

B. $a = -\frac{1}{9}, b = -\frac{1}{9}$

C. $a = \frac{1}{9}, b = \frac{1}{9}$

D. $a = \frac{1}{9} = -\frac{1}{9}$

Answer: B

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147. If $\int f(x)\cos x dx = \frac{1}{2} = \frac{1}{2}[f(x)]^2 + c,$ then $f(x)$ can be

A. 1

B. x

C. $\cos x$

D. $\sin x$

Answer: D

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148. If $\frac{d}{dx}[f(x)] = f(x),$ then $\int f(x)[g'(x) + g''(x)]dx =$

A. $f(x)g(x) + c$

B. $f'(x)g(x) + c$

C. $f(x)g'(x) + c$

D. $f'(x)g'(x) + c$

Answer: C

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149. $\int\left(\frac{1+\tan x}{1-\tan x}\right)dx$

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

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

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

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

Answer: A

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

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

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

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

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

Answer: C

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151. If $\int \frac{\tan x - \tan a}{\tan x + \tan a} dx = Ax + B\log[\sin(x+a)] + C$, then $(A, B) \equiv$

A. $(\cos 2a, \sin 2a)$

B. $(\cos 2a, \ -\sin 2a)$

C. $(\sin 2a, \ -\cos 2a)$

D. $(-\sin 2a, \cos 2a)$

Answer: B

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

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

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

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

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

Answer: D

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

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

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

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

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

Answer: B

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

A. $\frac{x^5}{5} - x^2 + \frac{1}{x} + c$

B. $x^2 - \frac{x^5}{5}\log x + c$

C. $\frac{x^5}{5} + x^2 + \frac{1}{x} + c$

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

Answer: D

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155. If $f'(x) = 3x^2 + 2x - 4$ and $f(1) = 3$, then $f(x) =$

A. $x^3 + x^2 - 4x + 5$

B. $x^3 - x^2 + 4x - 5$

C. $x^3 + x^2 - 4x + 3$

D. $x^3 + x^2 + 4x + 5$

Answer: A

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

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

B. $\frac{x}{2} - \tan x + c$

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

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

Answer: C

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157. If $\int \frac{1 + \cos\alpha\cos x}{\cos\alpha + \cos x} dx = ax + b\log\left[\frac{\cot(\alpha/2) + \tan(x/2)}{\cot(\alpha/2) - \tan(x/2)}\right] + c$

then $(a, b) \equiv$

A. $(\sin\alpha, \ -\cos\alpha)$

B. $(\cos\alpha, \sin\alpha)$

C. $(\sec\alpha, \cos\alpha)$

D. $(\cos\alpha, \cos\alpha)$

Answer: B

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

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

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

C. $\dfrac{-2}{e^{x}+e^{-x}}+c$

D. $\dfrac{2}{e^{2x}+e^{-2x}}+c$

Answer: A

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159. Which of the following functions has its derivative and integral both equal ?

A. 0

B. 1

C. x

D. e^{-x}

Answer: D

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

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

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

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

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

Answer: B

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161. If $\int e^x \sin x dx = \frac{\sqrt{2}}{2} e^x \sin(x + \alpha) + c$, then $\alpha =$

A. π

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

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

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

Answer: D

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162. $\int \frac{u\left(v\frac{du}{dx} - u\frac{dv}{dx}\right)}{v^3} dx =$

A. $\log\left(\frac{u}{v}\right) + c$

B. $\dfrac{u^2v^2}{2}+c$

C. $\dfrac{u^2}{2v^2}+c$

D. $\dfrac{u}{2v}+c$

Answer: C

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163. $\int \dfrac{udv+vdu}{\sqrt{uv}} =$

A. $\dfrac{2}{3}(uv)^{3/2}+c$

B. $2\sqrt{uv}+c$

C. $\dfrac{2}{3}\sqrt{\dfrac{u}{v}}+c$

D. $\dfrac{2}{3\sqrt{uv}}+c$

Answer: B

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164. If $\int \frac{\sin x}{\cos^5 x} dx = \int u^3 du$, then $u =$

A. $\sin x$

B. $\cos x$

C. $\sec x$

D. $\cos x$

Answer: C

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165. $\int \sec^4 x dx =$

A. $\dfrac{4\sin x}{\cos^5 x} + c$

B. $\tan x + \dfrac{1}{3}\tan^3 x + c$

C. $4\sec^3 x \log(\sec x + \tan x) + c$

D. $\dfrac{\sec^5 x}{5} + c$

Answer: B

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166. If $f(x) = \int \dfrac{x^2 + \sin^2 x}{1 + x^2}\sec^2 x dx$ and $f(0) = 0$, then $f(1) =$

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

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

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

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

Answer: C

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167. If $\int \frac{\sqrt{\cot x}}{\sin x \cos x} dx = P\sqrt{\cot x} + Q$, then P equals

A. 1

B. 2

C. -1

D. -2

Answer: D

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168. If $\int \frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x\cos^2 x} dx = A\sin 2x + B,$ then $A =$

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

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

C. -1

D. 1

Answer: A

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169. $\int \sin x d(\cos x) =$

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

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

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

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

Answer: B

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170. If $\int \frac{1}{\sqrt{e^{4x} - 36}} dx = m.\tan^{-1}\left[n.\sqrt{e^{4x} - 36}\right] + c,$ then :

$(m, n) \equiv$

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

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

C. $\left(\frac{1}{6}, \frac{1}{12}\right)$

D. $\left(\frac{1}{12}, \frac{1}{6}\right)$

Answer: D

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

A. $\frac{\sin x}{2 + 3\cos x} + c$

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

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

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

Answer: A

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172. $\int [f(\log x) + f'(\log x)]dx =$

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

B. $\dfrac{f(\log x)}{x} + c$

C. $e^x f(\log x) + c$

D. $\dfrac{x}{f(\log x)} + c$

Answer: A

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173. $\int \dfrac{udu + vdv}{u^2 + v^2} =$

A. $\log\left(u + \sqrt{u^2 + v^2}\right) + c$

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

C. $\tan^{-1}\left(\frac{u}{v}\right) + c$

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

Answer: B

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174. $\int \frac{vdu - udv}{u^2 + v^2} =$

A. $\log\left(u + \sqrt{u^2 + \sqrt{u^2 + v^2}}\right) + c$

B. $\log\left(v - \sqrt{u^2 + v^2}\right) + c$

C. $\tan^{-1}\left(\frac{u}{v}\right) + c$

D. $\log\left(u + v - \sqrt{u^2 + v^2}\right) + c$

Answer: C

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175. $\int \frac{1 + \tan^2 x}{1 + \cot^2 x} dx$ -

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

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

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

D. $\tan x - x + c$

Answer: D

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176. $\int \frac{\sin(x + a) - \sin(x - a)}{\sin(x + a) + \sin(x - a)} dx =$

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

B. $\tan a \log(\sin x) + c$

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

D. $\tan a \cos(\log x) + c$

Answer: B

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177. If $\int \frac{1}{\cos(x-a)\cos(x+a)}dx = m\log\left[\frac{\cos(x-a)}{\cos(x+a)}\right] + c$, then $m =$

A. $\cos 2a$

B. $\cot 2a$

C. $\sec 2a$

D. $\tan 2a$

Answer: A

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178. If $\int(\sin ax + \cos ax)(\sin bx + \cos bx)dx = \frac{\sin mx}{m} - \frac{\cos nx}{n} + c$, then $(m, n) \equiv$

A. $(a - b, a + b)$

B. $(a + b, a - b)$

C. $\left(a^2 + b^2, a^2 - b^2\right)$

D. $\left(a - b, a^2 + b^2\right)$

Answer: A

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179. $\int \frac{\tan ax - \cot bx}{1 + \tan ax \cot bx} dx =$

A. $\frac{-1}{a+b} \log\{\sin[(a+b)x]\} + c$

B. $\frac{-1}{a-b} \log\{\cos[(a-b)x]\} + c$

C. $\frac{-1}{a+b} \log\{[\cos(a+b)x]\} + c$

D. $\frac{1}{a-b} \log[\sec ax - \sec bx] + c$

Answer: A

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

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

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

C. $2\sin x + c$

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

Answer: C

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181. If $\int f(x)\sec^2 x dx = \frac{1}{2}[f(x)]^2 + c$, then : $f(x)$ can be

A. $\cos^5 x$

B. $\tan x + c$

C. $\cot x$

D. $\tan x$

Answer: D

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

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

B. $\cot x + c$

C. $\tan x + c$

D. $-\tan x + c$

Answer: C

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183. $\int \frac{a^4 - x^4}{a - x}dx =$

A. $x^4 + ax^3 + a^2x^2 + a^3x + c$

B. $\frac{x^4}{4} + \frac{ax^3}{3} + \frac{a^2x^2}{2} + a^3x + c$

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

D. $\frac{x^4}{4} + \frac{ax^3}{3} - \frac{a^2x^2}{2} + a^3x + c$

Answer: B

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184. $\int \frac{1}{\sqrt{x+a} - \sqrt{x+b}} dx =$

A. $\frac{2}{3(a-b)}\left[(x+a)^{3/2} + (x+b)^{3/2}\right] + c$

B. $\frac{2}{3(a-b)}\left[(x+a)^{3/2} - (x+b)^{3/2}\right] + c$

C. $\frac{2}{3(a+b)}\left[(x+a)^{3/2} - (x=b)^{3/2}\right] + c$

D. $\frac{2}{3(a+b)}\left[(x+a)^{3/2} + (x-b)^{3/2}\right] + c$

Answer: A

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185. $\int x^x dx + \int x^x \log x dx =$

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

B. $e^{x^x} + c$

C. $(xxx\ldots\text{ n times}) + c$

D. $x^x + c$

Answer: D

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

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

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

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

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

Answer: A

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

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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188. $\int \frac{1}{1 + \sin x + \cos x} dx =$

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

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

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

D. $\log\left[2 - \tan\left(\frac{x}{2}\right)\right] + c$

Answer: B

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189. If $\int \frac{1}{2+\cos^2 2x}dx = m\tan^{-1}\left[\sqrt{n}\tan 2x\right] + c$, then $(m, n) \equiv$

A. $\left(\frac{1}{2\sqrt{6}}, \frac{2}{3}\right)$

B. $\left(\frac{1}{6\sqrt{2}}, \frac{2}{3}\right)$

C. $\left(\frac{1}{2\sqrt{6}}, \frac{3}{2}\right)$

D. $\left(\frac{2}{3}, \frac{1}{2\sqrt{6}}\right)$

Answer: A

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190. If $\int \frac{5\cos x + 4\sin x}{3\sin x + 2\cos x}dx = ax + b\log(3\sin x + 2\cos x) + c$, then $(a, b) \equiv$

A. $\left(\frac{22}{13}, \frac{-7}{13}\right)$

B. $\left(\frac{23}{12}, \frac{-7}{12}\right)$

C. $\left(\frac{-22}{13}, \frac{-7}{13}\right)$

D. $\left(\frac{22}{13}, \frac{7}{13}\right)$

Answer: D

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191. $\int \frac{1}{a\sec x + b\tan x} dx =$

A. $\frac{1}{b}\log(a + b\sin x) + c$

B. $\frac{1}{a}\log(a + b\sin x) + c$

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

D. $\frac{1}{a}\log(b + a\sin x) + c$

Answer: A

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

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

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

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

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

Answer: D

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193. $\int\left[\lim_{h \to 0}\frac{\sec(x+h) - \sec x}{h}\right]dx =$

A. $\sec x + c$

B. $-\sec x + c$

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

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

Answer: A

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194. $\int\frac{1}{\left(a^2+b^2\right) - \left(a^2-b^2\right)\cos x}dx =$

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

B. $\frac{a}{b}\tan^{-1}\left[ab\tan\left(\frac{x}{2}\right)\right] + c$

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

D. $\frac{a}{b}\tan^{-1}\left[2ab\tan\left(\frac{x}{2}\right)\right] + c$

Answer: A

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

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

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

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

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

Answer: C

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196. $\int \frac{x^2 + 1}{x^4 - x^2 + 1} dx =$

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

B. $\tan^{-1}\left[\frac{x^2 - 1}{x}\right] + c$

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

D. $-\cot^{-1}\left[\frac{x^2 - 1}{x}\right] + c$

Answer: B

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

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

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

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

D. $\sqrt{3}\tan^{-1}\left[\frac{x^2 + 1}{x\sqrt{3}}\right] + c$

Answer: B

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198. $\int e^x \tan x(1 + \tan x) dx =$

A. $e^x(\tan x - 1) + c$

B. $e^x(\tan x + 1) + c$

C. $e^{-x}(\tan x - 1) + c$

D. $e^x\left(\sec^2 x - 1\right) + c$

Answer: A

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199. $\int e^{-x}(\cos x - \sin x)dx =$

A. $e^{-x}\sin x + c$

B. $e^x \sin x + c$

C. $-e^x \sin x + c$

D. $-e^{-x}\sin x + c$

Answer: A

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200. If $I_n = \int (\log x)^n dx$ for all $n \varepsilon N$, $I_n + nI_{n-1} =$

A. $(\log x)^n + x$

B. $(\log x)^{n-1}$

C. $\frac{(\log x)^n}{x}$

D. $x(\log x)^n$

Answer: D

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201. $\int \frac{1}{x^2 e^{a/x}} dx =$

A. $-\frac{1}{a} e^{a/x} + c$

B. $e^{a/x} + c$

C. $\frac{1}{a} e^{-a/x} + c$

D. $-e^{a/x} + c$

Answer: C

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202. $\int \left(1 - x^{-2}\right) e^{x + x^{-1}} dx =$

A. $\frac{e^{x + \frac{1}{x}}}{2x} + c$

B. $\frac{e^{x + \frac{1}{x}}}{x^2} + c$

C. $e^{x+\frac{1}{x}}+c$

D. $e^{x-\frac{1}{x}}+c$

Answer: C

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203. If $\int \frac{1}{f(x)}dx = \log[f(x)]^2 + c$, then $f(x) =$

A. $x+a$

B. $2x+a$

C. $\frac{x}{2}+a$

D. x^2+a

Answer: C

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204. $\int \frac{\sin^6 x + \cos^6 x}{\sin^2 2x} dx =$

A. $\cot x + \cot^2 x + c$

B. $\tan x - \cot x - 3x + c$

C. $2\left(\sin^5 x + \cos^5 x\right) + c$

D. $\sin^3 x + 2\cos^3 x + c$

Answer: B

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205. Evaluate: $\int \frac{a}{b + ce^x} dx$

A. $\frac{ac}{b} e^{-x} + d$

B. $\frac{ac}{b}\log\left(b + ce^{-x}\right) + d$

C. $\frac{a}{b}\log\left(be^{-x} + c\right) + d$

D. $\frac{a}{bc}\log\left(e^{-x} + bx\right) + d$

Answer: C

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206. $\int \tan^{-1}\left[\frac{\cos x}{1 - \sin x}\right]dx =$

A. $\frac{x}{4}(\pi + x) + c$

B. $\frac{\pi}{4}(x + \pi) + c$

C. $\frac{x}{2}(\pi + x) + c$

D. $\frac{x}{4}(\pi - x) + c$

Answer: A

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207. If $u = \frac{d}{dx}\left(e^{\sin x}\right), v = \lim_{h \to 0} \frac{e^{\sin(x+h)} - e^{\sin x}}{h}$ and $w = \int e^{\sin x} \cos x dx$, then

A. $u \neq v$

B. $v = w$

C. $\int w dx = v$

D. $\frac{dw}{dx} = w$

Answer: D

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208. $\dfrac{1 + \cos 4x}{\cot x - \tan x}$

A. $\dfrac{\cos 4x}{8} + c$

B. $\dfrac{\cos 4x}{4} + c$

C. $-\dfrac{\cos 4x}{4} + c$

D. $-\dfrac{\cos 4x}{8} + c$

Answer: D

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209. $\displaystyle\int \frac{\left(x - x^3\right)^{1/3}}{x^4} dx =$

A. $\dfrac{3}{8}\left(\dfrac{1}{x^2} - 1\right)^{4/3} + c$

B. $-\frac{3}{8}\left(\frac{1}{x^2}-1\right)^{4/3}+c$

C. $\frac{1}{8}\left(1-\frac{1}{x^2}\right)^{4/3}+c$

D. $-\frac{1}{8}\left(\frac{1}{x^3}-x\right)^{4/3}+c$

Answer: B

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210. $\int \frac{\left(1+3x^3\right)^{2/3}}{x^6}dx =$

A. $\frac{\left(1+3x^3\right)^{3/5}}{3x^3}+c$

B. $\frac{-\left(1+3x^3\right)^{5/3}}{5x^5}+c$

C. $\frac{\left(x^{-3}+3\right)^{3/2}}{5x^5}+c$

D. $\frac{-\left(x^{-3}+3\right)^{5/3}}{3x^5}+c$

Answer: B

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211. The value of $\int \frac{\left(ax^2-b\right)dx}{x\sqrt{c^2x^2-\left(ax^2+b\right)^2}}$ is equal to

A. $\sin^{-1}\left[\frac{1}{c}\left(ax+\frac{b}{x}\right)\right]+k$

B. $\sin^{-1}\left[\frac{1}{c}\left(ax^2+\frac{b}{x^2}\right]+k$

C. $\cos^{-1}\left[\frac{1}{c}\left(ax+\frac{b}{x}\right)\right]+k$

D. $\cos^{-1}\left[\frac{1}{c}\left(ax^2+\frac{b}{x^2}\right)\right]+k$

Answer: A

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212. If $f(x)=\int\frac{2\sin x-\sin 2x}{x^3}dx$, then : $\lim_{x\to 0}f'(x)=$

A. 0

B. ∞

C. -1

D. 1

Answer: D

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213. $\int \frac{1}{\cos x\sqrt{\cos 2x}}dx =$

A. $\sqrt{2}\left[\sqrt{\tan x} + \frac{1}{5}\tan^{5/2}x\right] + c$

B. $\sqrt{2}\left[\sqrt{\cot x} + \frac{1}{5}\tan^{5/2}x\right] + c$

C. $\sqrt{2}\left[\sqrt{\tan x} - \frac{1}{5}\tan^{5/2}x\right] + c$

D. $\sin^{-1}(\tan x) + c$

Answer: D

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214. Evaluate: $\int \frac{\cos x + x\sin x}{x(x + \cos x)}dx$

A. $\log\left[\frac{x}{x + \cos x}\right] + c$

B. $\log\left[\frac{x+\cos x}{x}\right]+c$

C. $\log\left[\frac{1}{x+\cos x}\right]+c$

D. $\log(x+\cos x)+c$

Answer: A

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215. 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. $\sqrt{2}\cos^{-1}(\sin x-\cos x)+c$

D. $\sqrt{\sec x}-\sqrt{\cos x}+c$

Answer: B

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216. $\int \frac{d^2}{dx^2}\left(\tan^{-1}x\right)dx =$

A. $\frac{1}{1+x^2}+c$

B. $\tan^{-1}x+c$

C. $x\tan^{-1}x-\frac{1}{2}\log\left(1+x^2\right)+c$

D. $\frac{2\tan^{-1}x}{1+x^2}+c$

Answer: A

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217. Integral of $\frac{1}{1+(\log x)^2}$ w.r.t. $(\log x)$ is

A. $\frac{1}{x}\tan^{-1}(\log x)+c$

B. $\tan^{-1}(\log x)+c$

C. $\frac{1}{x}\tan^{-1}x+c$

D. $\sin^{-1}(\log x)+c$

Answer: B

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218. Integral of $\frac{1}{\sqrt{x^2+4}}$ w.r.t. $\left(x^2+3\right)$ is

A. $\sqrt{x^2+4}+c$

B. $\frac{1}{\sqrt{x^2+4}}+c$

C. $2\sqrt{x^2+4}+c$

D. $3\sqrt{x^2+3}+c$

Answer: C

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219. $\int \frac{f(x)g'(x)+g(x)f'(x)}{f(x)g(x)}[\log f(x)+\log g(x)]dx=$

A. $f(x)g(x)\log[f(x)g(x)]+c$

B. $\frac{1}{2}\{\log[f(x)g(x)]\}^2+c$

C. $\{\log[f(x)g(x)]\}^2+c$

D. $\log[f(x)g(x)]+c$

Answer: B

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220. $\int \frac{3x + 1}{x^2(x + 1)} dx =$

A. $2\log x - \frac{1}{2x} - 2\log(x + 1) + c$

B. $2\log x - \frac{1}{2x} - 2\log(x - 1) + c$

C. $2\log x - \frac{1}{2x} + 2\log(x - 1) + c$

D. $3\log\left(\frac{x}{x + 1}\right) + c$

Answer: A

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221. $\int \frac{2x - 3}{x^3(x - 1)} dx =$

A. $\log x + \frac{1}{x} + \frac{3}{2x^2} + \log(x - 1) + c$

B. $\log x - \frac{1}{x} + \frac{3}{2x^2} + \log(x - 1) + c$

C. $\log x + \frac{1}{x} - \frac{3}{2x^2} - \log(x - 1) + c$

D. $2\log\left(\frac{x}{x - 1}\right) + c$

Answer: C

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222. $\int \frac{3x}{(x - 2)(x + 1)} dx$

A. $\frac{2}{5}\log\left(\frac{x - 1}{x + 1}\right) + \frac{1}{x - 1} + c$

B. $\frac{2}{5}\log\left(\frac{x - 1}{x + 1}\right) - \frac{1}{x - 1} + c$

C. $\frac{5}{2}\log\left(\frac{x + 1}{x - 1}\right) + \frac{1}{x + 1} + c$

D. $\frac{5}{2}\log\left(\frac{x + 1}{x - 1}\right) - \frac{1}{x - 1} + c$

Answer: B

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223. $\int \frac{1}{(x-2)\left(1+x^2\right)}dx =$

A. $\frac{1}{5}\left[\log(x+2)-\frac{1}{2}\log\left(1+x^2\right)+2\tan^{-1}x\right]+c$

B. $\frac{1}{5}\left[\log(x-2)+\frac{1}{2}\log\left(1+x^2\right)+2\tan^{-1}x\right]+c$

C. $\frac{1}{5}\left[\log(x-2)-\frac{1}{2}\log\left(1+x^2\right)-2\tan^{-1}x\right]+c$

D. $\log(x-2)+\tan^{-1}x+c$

Answer: C

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224. $\int \frac{2x - 1}{(x + 1)^3} dx =$

A. $\frac{3}{2(x + 1)^2} + c$

B. $\frac{3}{2(x + 1)^2} + \frac{2}{x + 1} + c$

C. $\frac{3}{2(x + 1)^2} - \frac{2}{x + 1} + c$

D. $x^2 - x - \frac{3}{2(x + 1)^2} + c$

Answer: C

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225. $\int \frac{1}{x\left(3x^2 + 2\right)} dx =$

A. $\frac{1}{4}\log\left(\frac{3x^2}{3x^2 + 2}\right) + c$

B. $\frac{1}{4}\log\left(\frac{3x^2+2}{3x^2}\right)+c$

C. $\frac{1}{4}\log\left(\frac{x^2}{3x^2+2}\right)+c$

D. $\frac{1}{4}\log\left(\frac{3x^2+2}{x^2}\right)+c$

Answer: A

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226. $\int \frac{1}{x\left(5-2x^2\right)}dx =$

A. $\frac{1}{10}\log\left(\frac{2x^2}{2x^2+5}\right)+c$

B. $\frac{1}{2}\log\left(\frac{2x^2}{5-2x^2}\right)+c$

C. $\frac{1}{2}\log\left(\frac{2x^2}{2x^2 - 5}\right) + c$

D. $\frac{1}{10}\log\left(\frac{2x^2}{2x^2 - 5}\right) + c$

Answer: D

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227. $\int \frac{1}{x^2(4x + 5)} dx =$

A. $\frac{1}{5x} + \frac{4}{25}\log\left(\frac{4x + 5}{x}\right) + c$

B. $\frac{-1}{5x} + \frac{4}{25}\log\left(\frac{4x + 5}{x}\right) + c$

C. $\frac{1}{5x} - \frac{4}{25}\log\left(\frac{4x + 5}{x}\right) + c$

D. $-\frac{1}{x} + \frac{1}{4}\log(4x + 5) + c$

Answer: B

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228. $\int \frac{1}{x^2(1-6x)}dx =$

A. $-\frac{1}{x} + 6\log\left(\frac{6x-1}{x}\right) + c$

B. $-\frac{1}{x} + 6\log\left(\frac{6x+1}{x}\right) + c$

C. $\frac{1}{x} + 6\log\left(\frac{6x+1}{x}\right) + c$

D. $-\frac{1}{x} - 6\log\left(\frac{6x-1}{x}\right) + c$

Answer: D

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229. $\int \frac{1}{x(2x - 3)^2} dx =$

A. $\frac{1}{3(2x - 3)} + \frac{1}{9}\log\left(\frac{2x - 3}{x}\right) + c$

B. $\frac{1}{3(3 - 2x)} - \frac{1}{9}\log\left(\frac{2x - 3}{x}\right) + c$

C. $\frac{1}{2x - 3} - \frac{1}{9}\log\left(\frac{2x - 3}{x}\right) + c$

D. $\log x - \frac{2}{2x - 3} + c$

Answer: B

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230. $\int \frac{1}{5(5x + 5)^2} dx =$

A. $\frac{1}{5(4x + 5)} - \frac{1}{25}\log\left(\frac{5x + 5}{x}\right) + c$

B. $\frac{1}{5(4x + 5)} + \frac{1}{25}\log\left(\frac{4x + 5}{x}\right) + c$

C. $\dfrac{-1}{5(4x+5)} + \dfrac{1}{25}\log\left(\dfrac{4x+5}{x}\right) + c$

D. $\log\left(\dfrac{4x+5}{x}\right) + c$

Answer: A

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231. $\displaystyle\int \frac{1}{(x-3)\left(x^2-7\right)}dx =$

A. $\dfrac{1}{2}\left(\dfrac{1}{x-3} + \dfrac{x+3}{x^2-7}\right) + c$

B. $\dfrac{1}{2}\log(x-3) - \dfrac{1}{4}\log\left(x^2-7\right) - \dfrac{3}{4\sqrt{7}}\log\left(\dfrac{\sqrt{7}+x}{\sqrt{7}-x}\right) + c$

C. $-\dfrac{1}{2}\left[\dfrac{1}{x-3} - \dfrac{x+3}{x^2-7}\right] + c$

D. $\dfrac{1}{2}\left[\dfrac{x+3}{x^2-7} - \dfrac{1}{x-3}\right] + c$

Answer: B

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232. $\int \frac{1}{(x+5)\left(x^2+4\right)}dx =$

A. $\frac{1}{9}\left[\frac{1}{x+5} - \frac{x-5}{x^2+4}\right] + c$

B. $\frac{1}{9}\left[\frac{1}{x-5} - \frac{x+5}{x^2-4}\right] + c$

C. $-\frac{1}{9}\left[\frac{1}{x-5} - \frac{x+5}{x^2+4}\right]$

D. $\frac{1}{9}\log(x+5) - \frac{1}{18}\log\left(x^2+4\right) + \frac{5}{18}\tan^{-1}\left(\frac{x}{2}\right) + c$

Answer: D

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233. $\int \frac{1}{(2x+3)^2(4x+5)}dx =$

A. $\frac{1}{2(2x+3)} + \frac{1}{3}\log\left(\frac{4x+5}{2x+3}\right) + c$

B. $\frac{1}{2}\left[\frac{1}{2x+3} - \log\left(\frac{4x+4}{2x+3}\right)\right] + c$

C. $\frac{1}{2}\left[\frac{1}{2x+3} + \log\left(\frac{4x+5}{2x+3}\right)\right] + c$

D. $\frac{1}{2(2x+3)} + \log\left(\frac{4x+5}{2x+3}\right) + c$

Answer: D

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234. $\int \frac{1}{(2-3x)^2(4-5x)}dx =$

A. $\frac{1}{2(2-3x)} - \frac{5}{4}\log\left(\frac{2-3x}{4-5x}\right) + c$

B. $\frac{1}{2(2-3x)}-\frac{5}{4}\log\left(\frac{4-5x}{2-3x}\right)+c$

C. $\frac{1}{2(2-3x)}+\frac{5}{4}\log\left(\frac{2-3x}{4-5x}\right)+c$

D. $\frac{1}{2(3x-2)}+\frac{5}{4}\log\left(\frac{4-5x}{3x-2}\right)+c$

Answer: B

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235. $\int\frac{x^2-1}{x^3\sqrt{2x^4-2x^2+1}}dx$ is equal to

A. $\frac{\sqrt{2x^4-2x^2+1}}{x^2}+c$

B. $\frac{\sqrt{2x^4-2x^2+1}}{x^3}+c$

C. $\frac{\sqrt{2x^4-2x^2+1}}{x}+c$

D. $\dfrac{\sqrt{2x^4 - 2x^2 + 1}}{2x^2} + c$

Answer: D

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236. The value of $\int [f(x)g''(x) - f''(x)g(x)]dx$ is equal to

A. $f(x)/g'(x)$

B. $f'(x).\ g(x) - f(x).\ g(x)$

C. $f(x).\ g'(x) + f(x).\ g(x)$

D. $f(x).\ g'(x) + f(x).\ g(x)$

Answer: C

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237. $\int \left(\cos^3 x\right) e^{\log(\sin x)} dx =$

A. $-\dfrac{\sin^4 x}{4} + c$

B. $-\dfrac{\cos^4 x}{4} + c$

C. $\dfrac{e^{\sin x}}{4} + c$

D. $\dfrac{\sin^4 x}{4} + c$

Answer: B

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238. If α, β are roots of $ax^2 + bx + c = 0$, then : $\int \dfrac{(x - \alpha)(x - \beta)}{ax^2 + bx + c} dx =$

A. $\infty. x + k$

B. $ax + c$

C. 0

D. $\frac{x}{a} + c$

Answer: D

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239. $\int \frac{(1 - \cos x)^{2/7}}{(1 + \cos x)^{9/7}} dx =$

A. $\frac{7}{22}\left(\tan^{11/7} x\right) + c$

B. $\frac{7}{11} \tan^{11/7}\left(\frac{x}{2}\right) + c$

C. $\frac{7}{22}(1 + \cos x)^{11/7} + c$

D. $\frac{7}{11}(1 - \cos x)^{11/7} + c$

Answer: B

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240. $\int\left(1+2x+0.5x^2\right)e^x dx =$

A. $(x+1)e^x + c$

B. $(1+4x)e^x + c$

C. $(x+0.5)e^x + c$

D. $\left(x+0.5x^2\right)e^x + c$

Answer: D

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241. $\int e^{x}.\,[f(x) - f'(x)]dx =$

A. $2e^{x}.\,f'(x) + c$

B. $e^{x}.\,[f(x) - f'(x)] + c$

C. $e^{x}.\,f''(x) + c$

D. $x.\,f''(x) + c$

Answer: B

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242. $\int \frac{4x^3}{\sqrt{x^4 - 1}}dx =$

A. $2\sqrt{\frac{x^2 - 1}{x^2 + 1}} + c$

B. $\log\left(x^2 + \sqrt{x^4 - 1}\right) + \tan^{-1}x + c$

C. $\dfrac{1}{2\sqrt{x^4 - 1}} + c$

D. None of these

Answer: D

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243. $\displaystyle\int \frac{1}{x^2\left(x^4 + 1\right)^{3/4}} dx =$

A. $\left(1 + \dfrac{1}{x^4}\right)^{1/4} + c$

B. $\left(x^4 + 1\right)^{1/4} + c$

C. $\left(1 - \dfrac{1}{x^4}\right)^{1/4} + c$

D. $-\left(1+\frac{1}{x^4}\right)^{1/4}+c$

Answer: D

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244. $\int \frac{\left(x^4-x\right)^{1/4}}{x^5}dx=$

A. $\frac{4}{15}\left(1-\frac{1}{x^3}\right)^{5/4}+c$

B. $\frac{4}{15}\left(x^3-1\right)^{5/4}+c$

C. $\frac{5}{12}\left(1-x^{-3}\right)^{4/5}+c$

D. $\frac{4}{5}\left(\frac{1}{x}-\frac{1}{x^4}\right)^{5/4}+c$

Answer: A

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245. $\int \frac{1}{\sqrt{1+\sqrt{x}}} dx =$

A. $\frac{4}{3}(x-2)\sqrt{1+x}+c$

B. $\frac{4}{3}\left(\sqrt{x}-2\right)\left(1+\sqrt{x}\right)+c$

C. $\frac{4}{3}\left(\sqrt{1+\sqrt{x}}\right)^3-4\sqrt{1+\sqrt{x}}+c$

D. $2\sqrt{1+\sqrt{x}}+c$

Answer: C

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246. $\int \frac{x^2+1}{x\left(x^2-1\right)} dx =$

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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247. $\int\frac{\log(3x)dx}{\log(9x)x}=$

A. $\log(3x)-\log(9x)+c$

B. $\log x-\log 3.\log(\log 9x)+c$

C. $\log 9 - \log x. \log(\log 3x) + c$

D. $\log x - \log 9. \log(\log 3x) + c$

Answer: B

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248. $\int (x - a)(x - b)dx =$

A. constant

B. $sc + sd + x$

C. $x^2 - ax$

D. $e^x + c$

Answer: A

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249. $\int \frac{x^3 + 3x^2 + 3x + 1}{(x+1)^5} dx =$

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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250. $\int \frac{\operatorname{cosec} x}{\cos^2\left(1 + \log\tan.\frac{x}{2}\right)} dx =$

A. $\sin^2\left(1 + \log\tan.\dfrac{x}{2}\right) + c$

B. $\tan\left(1 + \log\tan.\dfrac{x}{2}\right) + c$

C. $\tan(\operatorname{cosec}x + c)$

D. $\sin\left(\log\sin.\dfrac{x}{2}\right) + c$

Answer: B

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251. $\displaystyle\int \frac{1}{x\sqrt{x^6 - 16}}dx =$

A. $\sec^{-1}\left(\dfrac{x^3}{4}\right) + c$

B. $\dfrac{1}{12}\sec^{-1}\left(\dfrac{x^3}{4}\right) + c$

C. $\frac{1}{3}\sec^{-1}\left(\frac{x^3}{4}\right) + c$

D. $\frac{1}{3}\sin^{-1}\left(\frac{x^3}{4}\right) + c$

Answer: C

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252. If $\int x.\, f(x)dx = \frac{1}{2}f(x) + c$, then $f(x) =$

A. e^{2x}

B. e^{x^2}

C. $e^{x/2}$

D. e^{-x^2}

Answer: B

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253. If $\int g(x)dx = f(x)$, then : $\int f(x).\ g(x)dx =$

A. $\log[f(x)] + c$

B. $\frac{1}{2}[g(x)]^2 + c$

C. $\frac{1}{2}[f(x)]^2 + c$

D. $[g(x)]^2 + c$

Answer: C

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254. If $f'(x) = (x - 1)^3$ and $f(2) + f(-2) = 0$, then : $f(x) =$

A. $\frac{(x-1)^3}{3}-\frac{41}{3}$

B. $\frac{(x-1)^4}{4}-\frac{41}{3}$

C. $\frac{(x-1)^4}{4}-\frac{41}{4}$

D. $3(x-1)^4+\frac{41}{4}$

Answer: C

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255. If $\int \frac{2^x}{\sqrt{1-4^x}}dx = k.\sin^{-1}\left(2^x\right)+c$, then : $k=$

A. $\log 2$

B. $\log\left(\sqrt{2}\right)$

C. $\frac{1}{2}$

D. $\frac{1}{\log 2}$

Answer: D

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256. $\int \frac{x.\cos x}{\sqrt{x.\sin x+\cos x}}dx =$

A. $\frac{2}{3}(x.\sin x+\cos x)^{3/2}+c$

B. $2(x.\sin x+\cos x)^{1/2}+c$

C. $2(x.\sin x+\cos x)^{1/2}+c$

D. $2\sqrt{x\sin x+\cos x}+c$

Answer: C

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257. If $\int f(x)dx = g(x)$, then : $\int f^{-1}(x)dx =$

A. $x.\, f^{-1}(x) + g\left[f^{-1}(x)\right] + c$

B. $x.\, f^{-1}(x) - g\left[f^{-1}(x)\right] + c$

C. $x.\, f^{-1}(x) - f^{-1}[g(x)] + c$

D. $g^{-1}(x) + c$

Answer: B

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258. $\int (1 - \cos x).\, \operatorname{cosec}^2 x dx =$

A. $\tan\left(\frac{x}{2}\right) + c$

B. $\cot\left(\frac{x}{2}\right) + c$

C. $\frac{1}{2}\tan\left(\frac{x}{2}\right) + c$

D. $2\tan\left(\frac{x}{2}\right) + c$

Answer: A

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259. If $\int f(x)dx = 2[f(x)]^3 + c$, then $f(x)$ can be

A. $\frac{x}{2}$

B. x^3

C. $\frac{1}{\sqrt{x}}$

D. $\sqrt{\frac{x}{3}}$

Answer: D

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260. If $\int x^{-3}.5^{(1/x)^2}dx = k.5^{1/x^2}$, then : $k =$

A. $-2\log 5$

B. $-\frac{2}{\log 5}$

C. $2\log 5$

D. $-\frac{1}{2\log 5}$

Answer: D

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261. $\int (x-1)e^{-x}dx =$

A. $x.e^{-x}+c$

B. $-x.e^{-x}+c$

C. $x.e^{x}+c$

D. $-x.e^{x}+c$

Answer: B

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262. $\int \frac{1+x+\sqrt{x+x^2}}{\sqrt{x}+\sqrt{1+x}}dx=$

A. $\frac{1}{2}\sqrt{1+x}+c$

B. $\frac{2}{3}(1+x)^{3/2}+c$

C. $\sqrt{1+x}+c$

D. $2(1+x)^{3/2}+c$

Answer: B

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263. If $f(x) = \int \frac{5x^8 + 7x^6}{\left(x^2 + 1 + 2x^7\right)^2} dx, (x \geq 0)$, and f(0) = 0, then the value of f(1) is

A. $\frac{x^5}{x^2 + 1 + 2x^7} + c$

B. $\frac{-1}{2x^7 + x^2 + 1} + c$

C. $\frac{x^5}{2x^7 + x^2 + 1} + c$

D. $\frac{x^7}{2x^7 + x^2 + 1} + c$

Answer: D

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264. $\int \frac{a^{x/2}}{\sqrt{a^{-x} - a^{x}}} dx =$

A. $\frac{1}{\log a} . \sin^{-1}\left(a^{x}\right)$

B. $\frac{1}{\log a} . \tan^{-1}\left(a^{x}\right)$

C. $2\sqrt{a^{-x} - a^{x}}$

D. $\cos^{-1}\left(a^{x}\right)$

Answer: A

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265. $\int \frac{f'(x)}{f(x). \log f(x)} dx =$

A. $\frac{f(x)}{\log f(x)}$

B. $f(x). \log f(x)$

C. $\log[\log f(x)]$

D. $\dfrac{1}{\log[\log f(x)]}$

Answer: C

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266. If $I_1 = \int \sin^{-1} x dx$ and $I_2 \sin^{-1} \sqrt{-x^2} dx$, then

A. $I_1 = I_2$

B. $I_2 : I_1 = \frac{\pi}{2}$

C. $I_1 + I_2 = \frac{\pi}{2}$

D. $I_1 + I_2 = \frac{\pi}{2} x$

Answer: D

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267. $\int \frac{1 + \tan x}{e^{-x} \cos x} dx$ is equal to

A. $e^{-x}. \tan x + c$

B. $e^{-x}. \sec x + c$

C. $e^{x}. \sec x + c$

D. $e^{x}. \tan x + c$

Answer: C

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268. Integrate $w.r.t x, x^3[(x - a)(x - b)(x - c)]^{-1}$ given that $\frac{1}{A} = \frac{(a - b)(a - c)}{a^3}, \frac{1}{B} = \frac{(b - a)(b - c)}{b^3}, \frac{1}{C} = \frac{(c - a)(c - b)}{c^3}$

A. $x + A.\log(x - a) + B.\log(x - b) + C.\log(x - c) + C$

B. $A.\log(x - a) + B.\log(x - b) + C.\log(x - c) + D$

C. $1 + A.\log(x - a) + B.\log(x - b) + C.\log(x - c) + D$

D. $\frac{1}{A}\log(x - a) + \frac{1}{B}\log(x - b)$

Answer: B

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269. If : $\int \frac{f(x)}{\log(\cos x)} dx = -\log[\log(\cos x)] + c$, then : $f(x) =$

A. $\tan x$

B. $-\sin x$

C. $-\cos x$

D. $-\tan x$

Answer: A

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270. $\int \frac{dx}{\sin x + \sqrt{3}.\cos x} =$

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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271. $\int \frac{1}{\sqrt{\left(\log.\frac{1}{2}\right)^2 - x^2}} dx =$

A. $\sin^{-1}\left(\frac{x}{\log 2}\right) + c$

B. $-\sin^{-1}\left(\frac{x}{\log 2}\right) + c$

C. $-2\sin^{-1}\left(\frac{\log 2}{x}\right) + c$

D. $2.\sin^{-1}\left(\frac{\log 2}{x}\right) + c$

Answer: A

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272. $\int \frac{\sin 2x}{\sin 5x.\sin 3x} dx =$

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. $3.\log(\sin 3x) - 5.\log(\sin 5x) + c$

Answer: C

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273. $\int \cos^{-3/7} x \sin^{-11/7} x dx$ is equal to

A. $\log\left|\sin^{-4/7} x\right| + c$

B. $\frac{4}{7}\left(\tan^{4/7} x\right) + c$

C. $-\frac{7}{4}\left(\tan^{-4/7} x\right) + c$

D. $\log\left|\cos^{3/7} x\right| + c$

Answer: C

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274. $\int \frac{\sin x}{\sin x - \cos x} dx =$

A. $\frac{1}{2}. \log(\sin x - \cos x) + c$

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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275. 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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276. $\int \frac{2 - \sin x}{2 + \cos x} dx =$

A. $-\frac{4}{\sqrt{3}}. \tan^{-1}\left(\frac{1}{\sqrt{3}}. \tan. \frac{x}{2}\right) + \log(2 + \cos x) + c$

B. $\frac{4}{\sqrt{4}}. \tan^{-1}\left(\frac{1}{\sqrt{3}}. \tan. \frac{x}{2}\right) + \log(2 + \cos x) + c$

C. $\frac{4}{\sqrt{3}}.\tan^{-1}\left(\frac{1}{\sqrt{3}}.\tan.\frac{x}{2}\right) - \log(2 + \cos x) + c$

D. 0

Answer: B

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277. If : $\int \frac{2x^2 + 3}{\left(x^2 - 1\right)\left(x^2 - 4\right)}dx = \log\left[\left(\frac{x - 2}{x + 2}\right)^a.\left(\frac{x + 1}{x - 1}\right)^b\right] + c$

then : $(a, b) \equiv$

A. $\left(\frac{11}{12}, \frac{5}{6}\right)$

B. $\left(\frac{11}{12}, -\frac{5}{6}\right)$

C. $\left(-\frac{11}{12}, \frac{5}{6}\right)$

D. none of these

Answer: A

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278. $\int \frac{x^2 - 1}{x^4 + x^2 + 1} dx =$

A. $\frac{1}{2}. \log\left(\frac{x^2 + x + 1}{x^2 - x + 1}\right) + c$

B. $\frac{1}{2}. \log\left(\frac{x^2 - x + 1}{x^2 - x + 1}\right) + c$

C. $\log\left(\frac{x^2 - x + 1}{x^2 + x + 1}\right) + c$

D. $\frac{1}{2}. \log\left(\frac{x^2 - x + 1}{x^2 + x + 1}\right) + c$

Answer: D

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279. If $\int \frac{x+2}{2x^2+6x+5}dx$

$$= P\int \frac{4x+6}{2x^2+6x+5}dx + \frac{1}{2}\int \frac{dx}{2x^2+6x+5'}$$

Then the value of P is

A. $\frac{1}{3}$

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. 2

Answer: C

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280. $\int \frac{dx}{\sin x - \cos x + \sqrt{2}}$ is equal to

A. $-\frac{1}{\sqrt{2}}.\tan\left(\frac{x}{2}+\frac{\pi}{8}\right)+c$

B. $\frac{1}{\sqrt{2}}.\tan\left(\frac{x}{2}+\frac{\pi}{8}\right)+c$

C. $\frac{1}{\sqrt{2}}.\cot\left(\frac{x}{2}+\frac{\pi}{8}\right)+c$

D. $-\frac{1}{\sqrt{2}}.\cot\left(\frac{x}{2}+\frac{\pi}{8}\right)+c$

Answer: D

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281. If : $\int \frac{1+\cos 8x}{\tan 2x - \cot 2x}dx = a.\cos 8x + c,$ then : $a =$

A. $-\frac{1}{16}$

B. $\frac{1}{8}$

C. $\frac{1}{16}$

D. $-\frac{1}{8}$

Answer: C

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282. The value of $\sqrt{2}\int \frac{\sin x}{\sin\left(x - \frac{\pi}{4}\right)}dx$, is

A. $x + \ln\left|\sin\left(x - \frac{\pi}{4}\right)\right| + c$

B. $x - \ln\left|\cos\left(x - \frac{\pi}{4}\right)\right| + c$

C. $x + \ln\left|\cos\left(x - \frac{\pi}{4}\right)\right| + c$

D. $x - \ln\left|\sin\left(x - \frac{\pi}{4}\right)\right| + c$

Answer: A

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283. If : $\int \frac{\sqrt{5+x^{10}}}{x^{16}} dx = a\left(1+\frac{5}{x^{10}}\right)^{3/2} + c$, then : $a =$

A. $-\frac{1}{25}$

B. $\frac{1}{75}$

C. $-\frac{1}{75}$

D. $-\frac{1}{50}$

Answer: C

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284. $\int \frac{1}{\left(a^2 - b^2x^2\right)^{3/2}} dx =$

A. $\dfrac{x}{\sqrt{a^2 - b^2x^2}} + c$

B. $\dfrac{x}{a^2\sqrt{a^2 - b^2x^2}} + c$

C. $\dfrac{ax}{\sqrt{a^2 - b^2x^2}} + c$

D. none of these

Answer: B

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285. The value of $\int \dfrac{1}{x + \sqrt{x - 1}} dx$, is

A. $\log\left(x + \sqrt{x - 1}\right) + \sin^{-1}\sqrt{\dfrac{x - 1}{x}} + c$

B. $\log\left(x + \sqrt{x - 1}\right) + c$

C. $\log\left(x + \sqrt{x - 1}\right) + c$

D. $\log\left(x+\sqrt{x-1}\right)-\frac{2}{\sqrt{3}}.\tan^{-1}\left(\frac{2\sqrt{x-1}+1}{\sqrt{3}}\right)+c$

Answer: C

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286. $\int\frac{dx}{\sin x-\cos x+\sqrt{2}}$ is equal to

A. $-\frac{1}{\sqrt{2}}.\tan\left(\frac{\pi}{8}+\frac{x}{2}\right)+c$

B. $\frac{1}{\sqrt{2}.\tan\left(\frac{\pi}{8}+\frac{x}{2}\right)}$

C. $\frac{1}{\sqrt{2}}.\cot\left(\frac{\pi}{8}+\frac{x}{2}\right)$

D. $-\frac{1}{\sqrt{2}}.\cot\left(\frac{\pi}{8}+\frac{x}{2}\right)$

Answer: D

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287. If

$u = \int e^{ax} \sin\ bx\, dx$ and $v = \int e^{ax} \cos\ bx\, dx$ then $\left(u^2 + v^2\right)\left(a^2 + b^2\right) =$

A. $2e^{ax}$

B. e^{2ax}

C. $2e^{2ax}$

D. $bx.\ e^{ax}$

Answer: B

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288. If $u = \int e^{ax} \sin \ bx \ dx$ and $v = \int e^{ax} \cos \ bx \ dx$, then $\tan^{-1}\left(\frac{u}{v}\right) + \tan^{-1}\left(\frac{b}{a}\right)$ equals

A. bx

B. $2bx$

C. b^2x^2

D. $\sqrt{bx}$

Answer: A

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289. $\int \frac{1}{x. \sqrt{1 - x^3}} dx =$

A. $\frac{1}{3}.\log\left|\frac{\sqrt{1-x^3}-1}{\sqrt{1-x^2}+1}\right|+c$

B. $\frac{1}{3}.\log\left|\frac{\sqrt{1-x^3}+1}{\sqrt{1-x^3}-1}\right|+c$

C. $\frac{1}{3}.\log\left|\frac{1}{\sqrt{1-x^3}}\right|+c$

D. none of these

Answer: A

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290. If $f\left(\frac{3x-4}{3x+4}\right)=x+2$, then $\int$ f(x)dx is equal to

A. $e^{x+2}.\log\left|\frac{3x-4}{3x+4}\right|+c$

B. $-\frac{8}{3}.\log|1-x|+\frac{2x}{3}+c$

C. $\frac{8}{3}. \log|x - 1| + \frac{x}{3} + c$

D. none of these

Answer: B

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291. If : $\int \frac{1 + \cos 4x}{\cot x - \tan x} dx = A. \cos 4x + B$, then

A. $A = \frac{1}{8}, B \in R$

B. $A = -\frac{1}{8}, B \in R$

C. $A = \frac{1}{4}, B \in R$

D. none of these

Answer: B

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292. If : $\int \frac{1 - x^7}{x\left(1 + x^7\right)}dx = a.\log|x| + b.\log\left|x^7 + 1\right| + c,$ then :

$(a, b) \equiv$

A. $\left(1, \frac{2}{7}\right)$

B. $\left(-1, \frac{2}{7}\right)$

C. $\left(1, -\frac{2}{7}\right)$

D. $\left(-1, -\frac{2}{7}\right)$

Answer: C

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293. $\int \frac{\tan x}{\sqrt{\sin^4 x + \cos^4 x}} dx =$

A. $\log\left(\tan^2 x + \sqrt{1 + \tan^4 x}\right) + c$

B. $\frac{1}{2}. \log\left(\tan^2 x + \sqrt{1 + \tan^4 x}\right) + c$

C. $\frac{1}{4}. \log\left(\tan^2 x - \sqrt{1 + \tan^4 x}\right) + c$

D. none of these

Answer: B

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294. If $\int e^{ax} \cos bx dx = \frac{e2x}{29} f(x) + C$, then f'' (x)=

A. $29. f(x)$

B. $-29. f(x)$

C. $25. f(x)$

D. $-25. f(x)$

Answer: D

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295. If $\int f(x)dx = 2\{f(x)\}^3 + C$, then f (x) is

A. $\frac{x}{2}$

B. x^3

C. $\frac{1}{\sqrt{x}}$

D. $\sqrt{\frac{x}{3}}$

Answer: D

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296. $\int \frac{x^4+1}{x^6+1}dx =$

A. $\left(\tan^{-1}x\right)+\frac{1}{3}.\tan^{-1}\left(x^3\right)+c$

B. $\left(\tan^{-1}x\right)-\frac{1}{3}.\tan^{-1}\left(x^3\right)+c$

C. $\left(-\tan^{-1}x\right)-\frac{1}{3}.\tan^{-1}\left(x^3\right)+c$

D. none of these

Answer: A

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297. $\int\left(\frac{\sin^2 x\cos^2 x}{\sin^3 x+\cos^3 x}\right)dx=$

A. $\dfrac{1}{3\left(1+\tan^3 x\right)}+c$

B. $\dfrac{-1}{3\left(1+\tan^3 x\right)}+c$

C. $\dfrac{1}{1+\tan^3 x}+c$

D. $\dfrac{-1}{1+\tan^3 x}+c$

Answer: B

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298. Evaluate $\int \dfrac{\cos x-\sin x}{\cos x+\sin x}(2+2\sin 2x)dx$

A. $\sin 2x+c$

B. $\cos 2x+c$

C. $\tan 2x+c$

D. none of these

Answer: A

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299. $\int \frac{2x^{12}+5x^9}{\left(x^5+x^3+1\right)^3}dx =$

A. $\frac{x^2+2x}{\left(x^5+x^3+1\right)^2}+c$

B. $\frac{x^{10}}{2\left(x^5+x+1\right)^2}+c$

C. $\ln\left|x^5+x^3+1\right|+\sqrt{2x^7+5x^4}+c$

D. none of these

Answer: B

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300. $\int \frac{a+b.\sin x}{(b+a.\sin x)^2}dx =$

A. $\frac{-\cos x}{b+a.\sin x}+c$

B. $\frac{\cos x}{b+a.\sin x}+c$

C. $\frac{\sin x}{b+a.\sin x}+c$

D. none of these

Answer: A

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301. $\int \frac{(1-\cos x)^{2/7}}{(1+\cos x)^{9/7}}dx =$

A. $\frac{11}{7}.\tan^{7/11}\left(\frac{x}{2}\right)+c$

B. $\frac{7}{11}.\tan^{11/7}\left(\frac{x}{2}\right)+c$

C. $\frac{11}{7}.\sec^{7/11}\left(\frac{x}{2}\right)+c$

D. $\frac{7}{11}.\cot^{7/1}\left(\frac{x}{2}\right)+c$

Answer: B

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302. $\int \sec^{8/9}x\cos ec^{10/9}x$ dx is equal to

A. - $\left(\cot^{1/9}x\right)+c$

B. 9. $\left(\tan^{1/9}x\right)+c$

C. -$9\left(\cot^{1/9}x\right)+c$

D. -$\frac{1}{9}\left(\cot^{9}x\right)+c$

Answer: C

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303. If the integral $\int \frac{5\tan x}{\tan x - 2} dx = x + a\ln|\sin x - 2\cos x| + k$, then a is equal to:

A. -1

B. -2

C. 1

D. 2

Answer: D

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304. $\int \frac{\sec^2 x}{(\sec x + \tan x)^{\frac{9}{2}}} dx$

A. $\frac{-1}{(\sec x + \tan x)^{11/2}} \cdot \left\{\frac{1}{11} - \frac{1}{7}(\sec x + \tan x)^2\right\} + k$

B. $\frac{1}{(\sec x + \tan x)^{11/2}} \cdot \left\{\frac{1}{11} - \frac{1}{7}(\sec x + \tan x)^2\right\} + k$

C. $\frac{-1}{(\sec x + \tan x)^{11/2}} \cdot \left\{\frac{1}{11} + \frac{1}{7}(\sec x + \tan x)^2\right\} + k$

D. $\frac{1}{(\sec x + \tan x)^{11/2}} \cdot \left\{\frac{1}{11} + \frac{1}{7}(\sec x + \tan x)^2\right\} + k$

Answer: C

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305. $\int x. \sin x. \sec^3 x dx =$

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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306. If $\int \frac{4e^x + 6e^{-x}}{9e^x - 4e^{-x}} dx = Ax + B\ln\left(9e^{2x} - 4\right) + C$, then

A. $A = \frac{3}{2}, B = \frac{36}{35}, C = \frac{3}{2}.(\log 3) + \text{constant}$

B. $A = \frac{3}{2}, B = \frac{35}{36}, C = \frac{3}{2}.(\log 3) + \text{constant}$

C. $A = -\frac{3}{2}, B = -\frac{35}{36}, C = -\frac{3}{2}.(\log 3) + \text{constant}$

D. none of these

Answer: D

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307. $\int\{1 + \tan x.\tan(x + \alpha)\}dx =$

A. $\cot\alpha.\log\left|\frac{\sin x}{\sin(x + \alpha)}\right| + c$

B. $\tan\alpha.\log\left|\frac{\sin x}{\sin(x + \alpha)}\right| + c$

C. $\cot\alpha.\log\left|\frac{\sin(x + \alpha)}{\sin x}\right| + c$

D. none of these

Answer: C

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308. $\int\tan(x - \alpha).\tan(x + \alpha).\tan 2x dx$ is equal to

A. $\log\left|\dfrac{\sqrt{\sec 2x}.\sec(x+\alpha)}{\sec(x-\alpha)}\right|+c$

B. $\log\left|\dfrac{\sqrt{\sec 2x}}{\sec(x-\alpha).\sec(x+\alpha)}\right|+c$

C. $\log\left|\dfrac{\sqrt{\sec 2x}.\sec(x-\alpha)}{\sec(x+\alpha)}\right|+c$

D. none of these

Answer: B

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309. If $\int\dfrac{dx}{\sqrt[3]{\sin^{11}x\cos x}}=-\left[\dfrac{3}{8}f(x)+\dfrac{3}{2}g(x)\right]+C$, then

A. $f(x)=\tan^{-8/3}x,\ g(x)=\tan^{-2/3}x$

B. $f(x)=\tan^{8/3}x,\ g(x)=\tan^{-2/3}x$

C. $f(x)=\tan^{-8/3}x,\ g(x)=\tan^{2/3}x$

D. none of these

Answer: A

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310. Evaluate: $\int \frac{dx}{\cos^3 x\sqrt{s \in 2x}}$

A. $\sqrt{2}\left(\sqrt{\cot x}+\frac{1}{5}\tan^{5/2}x\right)+c$

B. $\sqrt{2}\left(\sqrt{\tan x}+\frac{1}{5}\tan^{5/2}x\right)+c$

C. $\sqrt{2}\left(\sqrt{\tan x}-\frac{1}{5}\tan^{5/2}x\right)+c$

D. none of these

Answer: B

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311. Evaluate: $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos\alpha} dx$

A. $2(\cos x - \cos a) + c$

B. $2(\sin x - x.\cos a) + c$

C. $2(\cos x + x.\sin a) + c$

D. none of these

Answer: B

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312. $\int \frac{1 + \cos 4x}{\cot x - \tan x} dx =$

A. $-\frac{1}{8}\cos 4x$

B. $\frac{1}{8}\cos 4x$

C. $\frac{1}{8}\sin 4x$

D. $-\frac{1}{8}\sin 4x$

Answer: A

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313. $\int \frac{\cos 7x - \cos 8x}{1 + 2\cos 5x} dx =$

A. $\frac{1}{2}\cos 2x - \frac{1}{3}\cos 3x + c$

B. $\frac{1}{2}\cos 2x + \frac{1}{3}\cos 3x + c$

C. $\frac{1}{2}\sin 2x - \frac{1}{3}3x + c$

D. none of these

Answer: C

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314. $\int \frac{1}{\tan x + \cot x + \sec x + \operatorname{cosec}\ x} dx$ is equal to

A. $\frac{1}{2}(x + \sin x + \cos x) + c$

B. $\frac{1}{2}(x - \sin x + \cos x) + c$

C. $\frac{1}{2}(x + \sin x - \cos x) + c$

D. $\frac{1}{2}(\sin x - \cos x - x) + c$

Answer: D

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315. If : $\int \frac{\cos^3 x}{\sin^2 x + \sin x} dx = \log|f(x)| - f(x) + c$, then : f(x)=

A. $\sin x$

B. $\cos x$

C. $\tan x$

D. $\cot x$

Answer: A

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316. $\int x^{100x}.(1+\ln x)dx =$

A. $\int \frac{x^{100}x}{100}+c$

B. $x^{100x}+c$

C. $\frac{x^{99x}}{99}+c$

D. $dx^{99x}.(1+\ln x)+c$

Answer: A

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317. $\int \frac{x^9}{\left(4x^2+1\right)^6}dx =$

A. $\frac{1}{5x}.\left(4+\frac{1}{x^2}\right)^{-5}+c$

B. $\frac{1}{5}.\left(4+\frac{1}{x^2}\right)^{-5}+c$

C. $\frac{1}{10x}.\left(1+4x^2\right)^{-5}+c$

D. $\frac{1}{10}.\left(4+\frac{1}{x^2}\right)^{-5}+c$

Answer: D

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318. If $f(x) = cosx - \cos^2 x + \cos^3 x - .... \rightarrow \infty$ then $\int f(x)dx$ is equal to

A. $\tan. \frac{x}{2}$

B. $x + \tan. \frac{x}{2}$

C. $x - \frac{1}{2}\tan. \frac{x}{2}$

D. $x - \tan. \frac{x}{2}$

Answer: D

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319. $\int (x+1)(x+2)^7(x+3)dx$ is equal to

A. $\frac{(x+2)^{10}}{10} - \frac{(x+2)^8}{8} + c$

B. $\frac{(x+2)^2}{2} - \frac{(x+2)^8}{8} - \frac{(x+3)^2}{2} + c$

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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320. $\int \frac{x}{1+x^4} dx =$

A. $\frac{1}{2}\tan^2 x + c$

B. $\frac{1}{2}\tan\left(x^2\right) + c$

C. $\frac{1}{2}.\tan^{-1}\left(x^2\right) + c$

D. none of these

Answer: C

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321. $\int \frac{\sin x}{(\sin x - \cos x)} dx = ?$

A. $\sec^2\left(\frac{\pi}{4} - x\right) + c$

B. $\frac{x}{2} + \frac{1}{2}. \log|\sin x - \cos x| + c$

C. $\frac{x}{2} + \frac{1}{4}. \log|\cos x - \sin x| + c$

D. $\sec\left(\frac{\pi}{4} - x\right). \tan\left(\frac{\pi}{4} - x\right) + c$

Answer: B

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322. $\int \sqrt{1 + \sin\left(\frac{x}{2}\right)}dx =$

A. $4\left[\sin\left(\frac{x}{2}\right) + \cos\left(\frac{x}{2}\right)\right] + c$

B. $4\left[\sin\left(\frac{x}{4}\right) - \cos\left(\frac{x}{4}\right)\right] + c$

C. $\sqrt{1 - \sin\left(\frac{x}{2}\right)} + c$

D. none of these

Answer: B

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323. $\int \left(e^{\log x} + \sin x\right).\cos x dx =$

A. $x.\cos x - \sin x + 4.\cos 2x + c$

B. $x.\sin x + \cos x - \frac{1}{4}.\cos 2x + c$

C. $x.\sec x + \tan x - \frac{1}{2}.\sin 2x + c$

D. none of these

Answer: B

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324. $\int \frac{(x-1).e^x}{(x+1)^3}dx =$

A. $\frac{e^x}{x+1} + c$

B. $\frac{e^x}{(x+1)^2} + c$

C. $e^x.(x+1)^3 + c$

D. none of these

Answer: B

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325. If : $\int\left(\sqrt{\tan x}+\sqrt{\cot x}\right)dx = m\sin^{-1}(u)+c,$ then :

A. $m = -\sqrt{2}, u = \cos x + \sin x$

B. $m = \dfrac{1}{\sqrt{2}}, u = \cos x - \sin x$

C. $m = \sqrt{2}, u = \sin x - \cos x$

D. none of these

Answer: C

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326. 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. $x - \log\left|\cos\left(x - \frac{\pi}{4}\right)\right| + c$

C. $x + \log\left|\cos\left(x - \frac{\pi}{4}\right)\right| + c$

D. $x - \log\left|\sin\left(x - \frac{\pi}{4}\right)\right| + c$

Answer: A

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327. Evaluate $\int \frac{\cos x - \sin x}{\cos x + \sin x}(2 + 2\sin 2x)dx$

A. $\sin 2x + c$

B. $\cos 2x + c$

C. $\tan 2x + c$

D. none of these

Answer: A

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MULTIPLE CHOICE QUESTIONS (PREVIOUS YEARS MHT-CET EXAM QUESTIONS)

1. $\int \frac{3dx}{\left(x^2+1\right)\left(x^2+4\right)} =$

A. $\log\left(x^2+1\right) - \log\left(x^2+4\right) + c$

B. $\tan^{-1}x - \frac{1}{2}\tan^{-1}\left(\frac{x}{2}\right) + c$

C. $2\tan^{-1}x - \tan^{-1}\left(\frac{x}{2}\right) + c$

D. $\frac{1}{2}\tan^{-1}\left(\frac{x}{2}\right) - \tan^{-1}x + c$

Answer: D

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2. $\int \frac{xe^x}{(x+2)^3}dx =$

A. $\frac{e^x}{x+2} + c$

B. $\frac{e^x}{(x+2)^2} + c$

C. $\frac{e^x}{(x+2)^3} + c$

D. $\frac{xe^x}{(x+2)^2} + c$

Answer: B

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3. $\int\left[\frac{1}{\log x}-\frac{1}{(\log x)^2}\right]dx=$

A. $\frac{1}{\log x}+c$

B. $\frac{x}{\log x}+c$

C. $\frac{x}{(\log x)^2}+c$

D. $\log x+c$

Answer: B

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4. $\int\frac{1}{\sqrt{a^2-b^2x^2}}dx=$

A. $\frac{1}{ab}\sin^{-1}\left(\frac{bx}{a}\right)+c$

B. $\frac{1}{ab}\sin^{-1}\left(\frac{ax}{b}\right)+c$

C. $\frac{1}{b}\sin^{-1}\left(\frac{bx}{a}\right)+c$

D. $\frac{1}{a}\sin^{-1}\left(\frac{bx}{a}\right)+c$

Answer: C

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5. $\int \frac{1}{x+x^{-n}}dx=$

A. $\frac{1}{n+1}\log\left|x^{n+1}+1\right|+c$

B. $\frac{1}{n}\log\left|x^{n}\right|+c$

C. $\frac{1}{n+1}\log\left|x^{n}+1\right|+c$

D. $\frac{1}{n}\log\left|x^{n+1}\right| + c$

Answer: A

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6. $\int e^x\left(\frac{x - 1}{x^2}\right)dx =$

A. $e^{x+1} + c$

B. $xe^x + c$

C. $\frac{e^x}{x} + c$

D. $\frac{e^x}{x^2} + c$

Answer: C

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7. $\int x\log x,\ dx$

A. $\frac{1}{4}\left(2x^2\log x - 1\right) + c$

B. $\frac{x^2}{4}(2\log x + 1) + c$

C. $\frac{x^2}{2}(2\log x - 1) + c$

D. $\frac{x^2}{4}(2\log x - 1) + c$

Answer: D

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8. $\int [\sin(\log x) + \cos(\log x)]dx$

A. $x\cos(\log x) + c$

B. $\sin(\log x) + c$

C. $x\sin(\log x) + c$

D. $\cos(\log x) + c$

Answer: C

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9. If $f(x) = x, g(x) = \sin x,$ then $\int f[g(x)]dx$ is equal to

A. $\sin x + c$

B. $-\cos + c$

C. $\frac{x^2}{2} + c$

D. $x\sin x + c$

Answer: B

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10. $\int e^{\tan x}\left(\sec^2 x + \sec^3 x \sin x\right)dx$ is equal to

A. $\sec x e^{\tan x} + c$

B. $\tan x e^{\tan x} + c$

C. $e^{\tan x} + \tan x + c$

D. $(1 + \tan x)e^{\tan x} + c$

Answer: B

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11. $\int \frac{1}{16x^2 + 9}dx$ is equal to

A. $\frac{1}{3}\tan^{-1}\left(\frac{4x}{3}\right) + c$

B. $\frac{1}{4}\tan^{-1}\left(\frac{4x}{3}\right)+c$

C. $\frac{1}{12}.\tan^{-1}\left(\frac{4x}{3}\right)+c$

D. $\frac{1}{12}\tan^{-1}\left(\frac{3x}{4}\right)+c$

Answer: C

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12. $\int \frac{\sqrt{\tan x}}{\sin 2x}dx =$

A. $\sqrt{\frac{\sin x}{\cos x}}+c$

B. $\frac{1}{\sqrt{\cos x}}+c$

C. $\sqrt{\cos x}+c$

D. $\sqrt{\frac{\cos x}{\sin x}}+c$

Answer: A

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13. $\int\left(\frac{2e^{x}+5}{2e^{x}+1}\right)dx=$

A. $5x+4\log\left|2e^{x}+1\right|+c$

B. $-5x+4\log\left|2e^{x}+1\right|+c$

C. $-5x-4\log\left|2e^{x}+1\right|+c$

D. $5x-4\log\left|2e^{x}+1\right|+c$

Answer: D

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TEST YOUR GRASP

1. $\int \frac{x}{4x+5} dx =$

A. $\frac{4}{x} - \frac{16}{5}\log(4x+5) + c$

B. $\frac{x}{4} - \frac{5}{16}\log(4x+5) + c$

C. $\frac{x}{4} - \frac{5}{16}\log(4x+5) + c$

D. $\frac{x^2}{2} + \frac{1}{4}\log(4x+5) + c$

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2. $\int \frac{1}{e^x 4e^{-x}} dx =$

A. $\frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right) + c$

B. $\tan^{-1}\left(\frac{e^x}{2}\right) + c$

C. $\frac{1}{4}\tan^{-1}\left(\frac{e^x}{2}\right)$

D. $-\frac{1}{2}\tan^{-1}\left(\frac{e^x}{2}\right) + c$

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3. Evaluate $\int \frac{\sec x}{(\sec x + \tan x)} dx.$

A. $\log(\sec x + \tan x) + c$

B. $\tan x - \sec x + c$

C. $\sec x + \tan x + c$

D. $\sec x - \tan x + c$

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4. $\int \frac{1}{x\left(x^{-11}+1\right)}dx =$

A. $\log\left(\frac{x^{-11}}{x^{-11}+1}\right)+c$

B. $11.\log\left(\frac{x^{-11}}{x^{-11}+1}\right)+c$

C. $-\frac{1}{11}\log\left(\frac{x^{-11}}{x^{-11}+1}\right)+c$

D. $-\frac{11}{x}\log\left(\frac{x^{-1}}{x^{-11}+1}\right)+c$

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5. $\int(1 - \cos x)\cos^2 x dx =$

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. $\tan\left(\frac{x}{2}\right) + c$

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6. $\int \frac{7x^8 + 8x^7}{\left(x^8 + x + 1\right)^2} dx =$

A. $\frac{x^8}{1 + x + x^8} + c$

B. $\dfrac{x^7}{\left(1+x+x^8\right)^2}+c$

C. $\dfrac{x}{1+x+x^8}+c$

D. $\dfrac{x}{\left(1+x+x^8\right)^2}+c$

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7. $\int \dfrac{1}{\sin x.\cos^3 x}dx =$

A. $\log(\tan x) - \dfrac{1}{2}\tan^2 x + c$

B. $\log(\tan x) + \dfrac{1}{2}\tan^2 x + c$

C. $\log(\tan x) + \tan x + c$

D. $\log(\tan x) - \tan x + c$

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8. $\int \frac{3e^x - 4}{e^x + 1} dx =$

A. $3x + 7\log(1 + e^{-x}) + c$

B. $3x + 7\log(1 + e^x) + c$

C. $-4x + 7\log(1 + e^x) + c$

D. $3x - 7\log(1 + e^{-x}) + c$

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9. $\int \frac{x^2}{x^2 - 5x + 6} dx =$

A. $x + \log\left[\dfrac{(x-2)^4}{(x-3)^3}\right] + c$

B. $x + \log\left[\dfrac{(x-3)^9}{(x-2)^4}\right] + c$

C. $x - \log\left[\dfrac{(x-3)^9}{(x-2)^4}\right] + c$

D. $\log\left[\dfrac{(x-2)^4}{(x-3)^9}\right] - c + c$

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10. $\int 2^x.3^{x+1}.4^{x+2}dx =$

A. $\dfrac{(48)^x}{\log 48}$

B. $\dfrac{(24)^{x+2}}{\log 24}$

C. $\dfrac{2^x.3^{x+1}.4^{x+2}}{\log 2 + \log 4 + \log 3}$

D. $\dfrac{2^{x+1}.3^{x+2}.4^{x+3}}{\log 2 + \log 3 + \log 4}$

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11. $\int \sin^3 x.\sqrt{\cos x}dx =$

A. $\frac{2}{5}\left(\sqrt{\cos x}\right)^5 - \frac{2}{3}\left(\sqrt{\cos x}\right)^3 + c$

B. $\frac{2}{7}\left(\sqrt{\cos}\right)^7 - \frac{2}{3}\left(\sqrt{\cos x}\right)^3 + c$

C. $3\sin^2 x\sqrt{\cos x} + c$

D. $-\sin^2 x\sqrt{\cos x} + c$

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12. If $\int \frac{1}{x+x^5}dx = f(x) + c, the \ne valuate \int \frac{x^4}{x+x^5}dx$.

A. $f(x) - \log x + c$

B. $\log x - f(x) + c$

C. $f(x) + \log x + c$

D. $f(x). \log x + c$

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13. $\int \frac{e^{5\log x} - e^{4\log x}}{e^{3\log x} - e^{2\log x}}dx$

A. $3e^{-3x} + c$

B. $3\log x + c$

C. $\dfrac{x^3}{3} + c$

D. $e^{\log x} + c$

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14. $\int [f(\log x) + f'(\log x)]dx =$

A. $x. f(\log x) + c$

B. $\dfrac{f(\log x)}{x} + c$

C. $e^x. f(\log x) + c$

D. $e^{f(x)}. f'(\log x) + c$

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15. $\int [f(x) + x. f'(x)]dx =$

A. $x. f(x) + c$

B. $e^x. f(x) + c$

C. $\dfrac{x}{f(x)} + c$

D. $x. f(\log x) + c$

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16. $\int \sqrt{1 - \sin x} dx =$

A. $\dfrac{2}{3}(1 - \sin x)^{3/2} + c$

B. $-\sqrt{2}. \log\left[\tan\left(\dfrac{3\pi}{8} - \dfrac{x}{4}\right)\right] + c$

C. $2\sqrt{1 + \sin x} + c$

D. $2\left[\sin\left(\frac{x}{2}\right) - \cos\left(\frac{x}{2}\right)\right] + c$

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17. $\int \frac{x^{11} + x^{12} + x^{13}}{x^{14} + x^{15}} dx =$

A. $\frac{12x^{11} + 13x^{12}}{\left(x^{14} + x^{15}\right)^2} + c$

B. $\log\left(\frac{x}{x+1}\right) - \frac{1}{2x^2} + c$

C. $\frac{1}{2x^2} + \log\left(\frac{x}{1+2x}\right) + c$

D. $\frac{x^{12}}{12} . \log(1+x) + c$

Answer: B

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18. $\int \frac{x + \tan x}{x . \sin x . \sec x} dx =$

A. $\frac{x^2}{2} + \log(\sec x) + c$

B. $\log(x . \sin x) + c$

C. $\log(x . \sin x) + c$

D. $-\frac{x^2}{2} . \cos x . \log(\sec x + \tan x) + c$

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19. $\int \frac{\sin x}{1 - \sin^2 x} dx =$

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20. $\int \frac{x^2 + x^{-4}}{x^3 - x^{-3}} dx =$

A. $\frac{1}{3}\log\left(1 + x^6\right) + c$

B. $\frac{1}{3}\tan^{-1}\left(x^3\right) + c$

C. $\log x^3 + x^{-3} + c$

D. $3\cot^{-1}\left(x^3\right) + c$

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21. $\int \frac{1}{\sin x + \sqrt{3}\cos x} dx =$

A. $\log\left(\sec x - \sqrt{3}\sin x\right) + c$

B. $\log\left[\sin\left(x + \frac{\pi}{6}\right) + \cos\left(x + \frac{\pi}{6}\right)\right] + c$

C. $\log\left[\tan\left(\frac{x}{2}\right)+\frac{\pi}{6}\right)\right]+c$

D. $\log\left[\tan\left(\frac{x}{2}+\frac{5\pi}{12}\right)\right]+c$

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22. $\int\frac{x+\sqrt{1-x^2}}{x.\sqrt{1-x^2}}dx=$

A. $e^x+\sin^{-1}x+c$

B. $\log x+2\sqrt{1-x^2}+c$

C. $\sin^{-1}x+\log x+c$

D. $\sin^{-1}(\log x)+c$

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23. $\int\left(\cot^2 x + \cot^4 x\right)dx =$

A. $\frac{1}{3}\cot^3 x + \frac{1}{5}\cot^5 x + c$

B. $-\frac{1}{3}\cot^3 x - \frac{1}{5}\cot^5 x + c$

C. $-\frac{1}{3}\cot^3 x + c$

D. $-\frac{1}{3}\cos^3 x + c$

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24. $\int \frac{1}{\sqrt{x^2 - (x.\log x)^2}}dx =$

A. $\log(\log x) + \sqrt{1 - (\log x)^2} + c$

B. $\log\left(\sin^{-1}x\right) + c$

C. $2\sqrt{1 - \log x + c}$

D. $\sin^{-1}(\log x) + c$

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25. $\int \frac{\log(\log x)}{x.\log x} dx =$

A. $\log(x.\log x) + c$

B. $\frac{1}{2}[\log(\log x)]^2 + c$

C. $\frac{1}{2}(x.\log x)^2 + c$

D. $x.\log(\log x) + c$

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26. $\int \frac{dx}{\sqrt{e^{2x} - 1}} =$

A. $\log\left(e^{x} + \sqrt{e^{2x} - 1}\right) + c$

B. $2\sqrt{e^{2x} - 1} + c$

C. $\sec^{-1}\left(e^{x}\right) + c$

D. $\log\left(\sqrt{e^{2x} - 1}\right) + c$

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27. Find the value of $\int \frac{d\left(x^2 + 1\right)}{\sqrt{\left(x^2 + 2\right)}}$.

A. $2\sqrt{x^2 + 2} + c$

B. $\sqrt{x^2 + 2} + c$

C. $\left(x^2 + 1\right)^{-3/2} + c$

D. $2\sqrt{x^2 + 1} + c$

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28. $\int \frac{(2 - x)e^x}{(x - 1)^2} dx =$

A. $\frac{e^x}{2 - x} + c$

B. $\frac{e^x}{x - 1} + c$

C. $\frac{e^x}{1 - x} + c$

D. $\frac{e^x}{(x - 1)^2} + c$

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29. Slope of a curve at any point (x, y) on it is $(4x - 3)$. If u passes through the point (1, 3), then its equation is

A. $y = 2x - 3x + 4$

B. $y = 2x^2 + 3x - 2$

C. $x = 2y^2 - 3y - 8$

D. $x = 2y^2 + 3y - 26$

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30. $\int \frac{x^{e-1} - e^{x-1}}{\left(x^e - e^x\right)^2} dx =$

A. $\log\left(ex^{e} - e^{x}\right) + c$

B. $\log\left(e^{x} + x^{e}\right) + c$

C. $\dfrac{-1}{e\left(x^{e} - e^{x}\right)} + c$

D. $-\dfrac{x^{e} - e^{x}}{e} + c$

Answer: C

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31. $\int 3^{-2\log_9 x}dx =$

A. $-\dfrac{1}{x} + c$

B. $\log x + c$

C. $-\log_3 x + c$

D. $\dfrac{1}{x} + c$

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32. If $\int \frac{1+x+x^2}{x^2+x^3}dx = \frac{a}{x} + b.\log(x+1) + c,$ then

A. $a = 1, b = 1$

B. $a = -1, b = 1$

C. $a = 1, b = -1$

D. $a = -1, b = -1$

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33. $\int \frac{1}{\log\left(x^x\right).\log(ex)}dx =$

A. $\log(1 + \log x) + c$

B. $1 + \log_x e + c$

C. $\log\left(\log_{ex} x\right) + c$

D. $\log_x\left(\log_x e\right) + c$

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34. $\int e^x\left(x^4 - 12x^2\right)dx =$

A. $x^4 e^x + c$

B. $\left(x^4 - 4x^3\right)e^x + c$

C. $x^2 e^x + c$

D. $\left(x^4 + 4x^3\right)e^x + c$

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35. If $I_n = \int \frac{x^n}{1+x^2} dx$, where $n \in N$, then : $I_{n+2} + I_n =$

A. $\frac{1}{x} + c$

B. $\frac{x^n}{n+1} + c$

C. $\frac{x^{n+1}}{n+1} + c$

D. $\frac{x^{2n+3}}{2n+3} + c$

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36. $\int (x+1)^2 e^x dx$

A. $x^2 e^x + c$

B. $2\left(x^2 + 1\right)e^x + c$

C. $\left(x^2 + 1\right)e^x + c$

D. $2x.\ e^x + c$

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37. If $x = at^2, y = 2at,$ then : $\int y^2 dx =$

A. $ax^2 + c$

B. $2ax + c$

C. $2ax^2 + c$

D. $2\sqrt{ax} + c$

Answer: C

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38. If $y = x^2 + 2x + 3$, then : $\int \left(\frac{dx}{dy}\right) dx =$

A. $2\log(y + 1) + c$

B. $\log\left(\sqrt{1 + x}\right) + c$

C. $\frac{d^2x}{dy^2}$

D. $\frac{x^3}{3} + x^2 + 3x + c$

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39. If $y = x^{x^{x^{\dots \text{ to } \infty}}}$, then : $\int (\log x) dy =$

A. $2(\log x)^2 + c$

B. $\frac{1}{2}(\log y)^2 + c$

C. $2(\log y)^2 + c$

D. $x^{x^{x^{\dots \text{ to } (\infty + 1)}}}$

Answer: B

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40. $\int \frac{1}{\cos x . \sqrt{\sin x . \cos x}} dx =$

A. $2\sqrt{\sin x} + c$

B. $2\sqrt{\cos x} + c$

C. $2\sqrt{\tan x} + c$

D. $2\sqrt{\cot x} + c$

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41. $\int \frac{\sqrt{\cot x}}{\sin 2x} dx$ -

A. $-\sqrt{\sin x} + c$

B. $\sqrt{\cos x} + c$

C. $\sqrt{\tan x} + c$

D. $-\sqrt{\cot x} + c$

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42. $\int \cot x \operatorname{cosec}^2 x dx =$

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43. $\int \frac{\tan x}{1+\cos x} dx =$

A. $-\log\left(\frac{\cos}{1+\cos x}\right)+c$

B. $\log\left(\frac{\cos x}{1+\cos x}\right)+c$

C. $\log\left(\frac{1+\sin x}{\sin x}\right)+c$

D. $\log\left(\frac{1+\tan x}{\tan x}\right)+c$

Answer: A

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44. If y is the primitive of $e^{-\log x}$, then : $e^{y} =$

A. $\log x$

B. e^{-x}

C. x

D. $-x$

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45. $\int \sec x dx =$

A. $\log\left[\tan\left(\frac{\pi}{4} - \frac{x}{2}\right)\right] + c$

B. $\log\left[\cot\left(\frac{x}{2}\right)\right] + c$

C. $\frac{1}{2}\log\left[\frac{1 + \sin x}{1 - \sin x}\right] + c$

D. $\log(\sec x - \tan x) + c$

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