doubtnut
India's Number 1 Education App

MATHS

BOOKS - MTG WBJEE MATHS (HINGLISH)

INDEFINITE INTEGRALS

Wb Jee Workout Category 1 Single Option Correct Type

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

A. $\log|1+x^2|+c$

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

C. $\log|1+x^3|+c$

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

Answer: B

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

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

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

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

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

Answer: B

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3. $\int \frac{dt}{t + \sqrt{a^2 - t^2}}$

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

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

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

D. None of these

Answer: B

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4. $\int \frac{x^2-1}{(x^2+1)\sqrt{x^4+1}}$ dx is equal to -

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

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

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

D. None of these

Answer: C

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

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

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

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

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

Answer: B

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6. If

$$\int\left(x^6+x^4+x^2\right)\left(2x^4+3x^2+6\right)^{1/2}dx=k\left(Ax^6+Bx^4+Cx^2\right)^p+C_1$$

then

A. $k=\frac{1}{18}, A=B=C=p$

B. $k=\frac{1}{18}, A=2, B=3, C=6, p=\frac{3}{2}$

C. $k=3, p=\frac{1}{3}, A=B=C$

D. None of these

Answer: B

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7. If $\int \sin^4 x e^{\log \cos x} dx = \frac{1}{k} \sin^p x + c$, then

A. $k \neq p$

B. $k = 3, p = 5$

C. $k = p = 5$

D. $k = p = -5$

Answer: C

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8. If $\int \sqrt{\frac{(1-\sqrt{x})}{1+\sqrt{x}}} dx = A\sqrt{1-x} + B \sin^{-1} \sqrt{x} + C\sqrt{x-x^2} + D$,

where $A + B + C =$

A. -1

B. -2

C. 3

D. -4

Answer: B

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9. $\int \frac{\sin(2x)}{a\cos^2 x + b\sin^2 x} dx =$

A. $(b-a)\log\left(a\cos^2 x + b\sin^2 x\right) + c$

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

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

D. None of these

Answer: B

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

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

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

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

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

Answer: D

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11. $\int (x^x)^2 (1 + \log x) dx =$

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

B. $x^x + c$

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

D. None of these

Answer: A

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12. $\int e^x \left(\frac{2}{x} - \frac{2}{x^2} \right) dx$ is equal to

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

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

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

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

Answer: C

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

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

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

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

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

Answer: D

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14. $\int \frac{mx^{m+2n-1}-nx^{n-1}}{x^{2m+2n}+2x^{m+n}+1}dx$ is equal to

A. $\frac{x^m}{x^{m+n}+1}+c$

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

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

D. $-\frac{x^n}{x^{m+n}+1}+c$

Answer: D

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15. $\int \frac{\log(x/e)}{(\log x)^2} dx =$

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

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

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

D. None of these

Answer: B

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16. $\int \cos \sqrt{x} dx =$

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

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

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

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

Answer: C

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

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

B. $x+c$

C. $\log x+c$

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

Answer: B

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18. $\int\frac{e^{2x}dx}{\sqrt[4]{e^x-1}}$ equals

A. $\frac{4}{21}(e^x-1)^{3/4}(3e^x+4)+c$

B. $\frac{(e^x-1)^{1/4}(3e^x+4)}{21}+c$

C. $\frac{4}{21}(e^x+1)(3e^x+4)$

D. None of these

Answer: A

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19. The value of the integral $\int\frac{dx}{(e^x+e^{-x})}$ is

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

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

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

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

Answer: C

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

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

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

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

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

Answer: C

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21. $\int \frac{\cot x}{\sqrt{\sin x}} dx =$

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

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

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

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

Answer: A

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22.

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

A. $\cos x$

B. $\sin x$

C. $\tan x$

D. 1

Answer: A

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23. $\int \tan^{-1}\sqrt{x}dx$ is equal to

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

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

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

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

Answer: D

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

A. $k=7$

B. $k=-7$

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

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

Answer: D

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25. $\int \sqrt{1+\cos x}dx$ is equal to

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

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

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

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

Answer: B

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26. $\int \frac{x^{1/2}}{x^3+a^3}dx$ equals

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

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

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

D. None of these

Answer: C

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

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

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

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

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

Answer: B

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28. $\int \frac{1-\cos x}{\cos x(1+\cos x)} dx$

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

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

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

D. None of these

Answer: A

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29. $\int \frac{dx}{\sin x - \cos x} =$

A. $\frac{1}{\sqrt{2}}\log\tan\left(\frac{x}{2} - \frac{\pi}{8}\right) + c$

B. $\log\tan\left(\frac{x}{2} + \frac{\pi}{8}\right) + c$

C. $\frac{1}{2}\log\tan\left(\frac{x}{2} + \frac{\pi}{8}\right) + c$

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

Answer: A

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30. $\int \frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x \cos^2 x} dx =$

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

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

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

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

Answer: A

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Wb Jee Workout Category 2 Single Option Correct Type

1. If $\int\sqrt{2+\tan^2 x}dx - \ln\tan x + \sqrt{2+\tan^2 x} + f(x) + c,$ then $f(x) =$

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

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

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

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

Answer: A

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2. Find $\int\frac{dx}{(x^2+a^2)(x^2+b^2)}$ equals

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

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

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

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

Answer: B

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3. $\int\frac{a+b\sin x}{(b+a\sin x)^2}dx$

A. $\frac{-\cos x}{b+a\sin x}+c$

B. $\frac{\cos x}{b+a\sin x}+c$

C. $\frac{\sin x}{b+a\sin x}$

D. None of these

Answer: A

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4. $\int\left(x^{7m}+x^{2m}+x^m\right)\left(2x^{6m}+7x^m+14\right)^{\frac{1}{m}}dx$

A. $\frac{\left(x^{7m}+x^{2m}+x^{m}\right)^{m+1}}{m+1}+c$

B. $\frac{1}{14(m+1)}\left(2x^{7m}+7x^{2m}+14x^{m}\right)^{\frac{m+1}{m}}+c$

C. $\left(2x^{7m}+7x^{2m}+x^{m}\right)^{\frac{m+1}{m}}+c$

D. None of these

Answer: B

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5. If

$$\int \frac{1}{4\sin^2 x+4\sin x\cos x+5\cos^2 x}dx = A\tan^{-1}(B\tan x+C)+k,$$

then

A. $A=1/4, B=1/2, C=1$

B. $A=1/2, B=1/4, C=1$

C. $A=1, B=1/2, C=1/4$

D. $A=1/4, B=1, C=1/2$

Answer: D

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6. $\int \frac{\left(\sqrt{x}\right)^3}{\left(\sqrt{x}\right)^5 + x^4} dx = A \log\left(\frac{x^k}{x^k + 1}\right) + c$ then the value A and K respectively are

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

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

C. does not exist

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

Answer: D

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7. If $\int\sqrt{x+\sqrt{x^2+2}}dx$ equals $k\left(x+\sqrt{x^2+2}\right)^{p/2}-\frac{2}{\left(x+\sqrt{x^2+2}\right)^{\frac{q}{2}}}+c$, then value of k, p, q are respectively are

A. $\frac{4}{3},\frac{3}{2},1$

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

C. $-2,\frac{1}{3},1$

D. None of these

Answer: B

View Text Solution

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

A. $\log(2\sin x+\cos x)=$

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

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

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

Answer: C

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9. Evaluate $\int\left(\sqrt{\tan x}+\sqrt{\cot x}\right)dx$

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

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

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

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

Answer: B

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10. $\int xe^{2x}(1+x)dx$ equals

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

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

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

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

Answer: D

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11. $\int \frac{x^2dx}{(x\sin x+\cos x)^2}=$

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

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

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

D. None of these

Answer: C

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12. $\int\left[\frac{1}{(x+a)^3(x+b)^5}\right]^{1/4} dx =$

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

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

C. $\frac{4}{b-a}\left(\frac{x+a}{x+b}\right)^{3/4}+c$

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

Answer: D

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13. If $\int\frac{2e^x+3e^{-x}}{3e^x+4e^{-x}}dx = Ax + B\log\left(3e^{2x}+4\right)$, then

A. $A = -\frac{3}{4}, B = \frac{1}{24}$

B. $A = \frac{3}{4}, B = -\frac{1}{24}$

C. $A = \frac{1}{4}, B = \frac{1}{24}$

D. $A = -\frac{3}{4}, B = \frac{1}{4}$

Answer: B

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14. If $\int(\sin 2x - \cos 2x)dx = \frac{1}{\sqrt{2}}\sin(2x - a) + b$, then the values of a & b are

A. $a = -\frac{5\pi}{4}, b \in R$

B. $a = \frac{5\pi}{4}, b \in R$

C. $a \in R, b = \frac{5\pi}{4}$

D. $b = -\frac{5\pi}{4}, a \in R$

Answer: A

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Wb Jee Workout Category 3 One Or More Than One Option Correct Type

1. $If f(x)\sin x\cos x dx = \frac{1}{2(b^2-a^2)}\ln f(x)+c, then f(x) is equa < o$

$\frac{1}{a^2\sin^2 x+b^2\cos^2 x}$ (b) $\frac{1}{a^2\sin^2 x-b^2\cos^2 x}$ $\frac{1}{a^2\cos^2 x+b^2\cos^2 x}$ (d) $\frac{1}{a^2\cos^2 x-b^2\cos^2 x}$

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

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

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

D. $\frac{1}{ab}\tan^{-1}\left(\tan\frac{bx}{a}\right)+c$

Answer: A

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

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

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

C. $f(x) = \tan x$

D. $f(x) = \tan^2 x$

Answer: A::C

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3. If $\int x \log\left(1 + x^2\right) dx = \phi(x) \log\left(1 + x^2\right) + x(\Psi) + C$, then

A. $\phi(x) = \frac{1 + x^2}{2}$

B. $\Phi(x) = \frac{1 + x^2}{2}$

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

D. $\phi(x) = \frac{-1 + x^2}{2}$

Answer: A::C

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4. $\int\sqrt{1+\sin 2x}dx =$

A. $\sin x+\cos x+c\forall x\in R$

B. $\sin x-\cos x+c\forall x\in R$

C. $\sin x-\cos x+c, x\in\left[\frac{-\pi}{4},\frac{3\pi}{4}\right]$

D. $\cos x-\sin x+c, x\in\left[\frac{3\pi}{4},\frac{7\pi}{4}\right]$

Answer: C::D

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5. If $\int e^x\frac{x-1}{(x+1)^3}dx=\frac{e^x}{(g(x))^a}+c$, then

A. $g(x)=(x+1)^2$

B. $g(x)=x+1$

C. $a=3$

D. $a = 2$

Answer: B::D

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6. If $\int \frac{dx}{\cos(x-a)\cos(x-b)} = \frac{1}{A}\left[\log\left(\frac{f(x)}{g(x)}\right)\right] + c$, then

A. $A = \sin(a-b)$

B. $f(x) = \sec(x-b)$

C. $g(x) = \sec(x-a)$

D. $A = \sin(b-a)$

Answer: A::B::C

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7. If $\int \frac{dx}{x^2(x^4+1)^{3/4}} = A\left(\frac{x^4+1}{x^4}\right)^B + c$, then

A. $A = -1$

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

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

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

Answer: A::B

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8. If

$$\int \frac{\log_x e . \log_{ex} e . \log_{e^2 x} e}{x} dx = A \log_e(\log_e x) + B \log_e(1 + \log_e x) + C \log_e($$

then

A. $A + B = 0$

B. $A + B = -1/2$

C. $A + C = 0$

D. $A - C = 0$

Answer: B::D

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9. Evaluate: $\int (x+2)\sqrt{x^2+x+1}\,dx$

A.

$$\frac{\left(x^2+x+1\right)^{3/2}}{3}+\frac{3(2x+1)}{8}\sqrt{x^2+x+1}-\frac{9}{16}\sqrt{x^2+x+1}+c$$

B.

$$\frac{\left(x^2+x+1\right)^{3/2}}{3}+\frac{3(2x+1)}{8}\sqrt{x^2+x+1}+\frac{9}{16}\log\left|\left(x+\frac{1}{2}\right)\right|+c$$

C.

$$\frac{\left(x^2+x+1\right)^{3/2}}{3}+\frac{3(2x+1)}{8}\sqrt{x^2+x+1}+\frac{9}{16}\log\left|\left(x+\frac{1}{2}\right)+\sqrt{}\right.$$

D.

$$\frac{3(2x+1)}{8}\sqrt{x^2+x+1}+\frac{9}{16}\log\left|\left(x+\frac{1}{2}\right)+\sqrt{x^2+x+1}\right|+c$$

Answer: C

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

A. $\frac{5}{16}\log\left|\frac{x-2}{x+2}\right| - \frac{7}{(x-2)} + c$

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

C. $\frac{5}{16}\log\left|\frac{x-2}{x+2}\right| + \frac{7}{4(x+2)} + c$

D. $\frac{5}{16}\log\left|\frac{x-2}{x+2}\right| - \frac{7}{4(x-2)} + c$

Answer: D

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

A. $\log\left|\left(x+\frac{5}{2}\right) + \sqrt{x^2+5x+6}\right| + c$

B. $\log\left|\left(x-\frac{5}{2}\right) + \sqrt{x^2-5x+6}\right| + c$

C. $\log\left|\left(x-\frac{5}{2}\right) + \sqrt{x^2+5x+6}\right| + c$

D. $\log\left|\left(x-\frac{5}{2}\right)+\sqrt{x^2-5x-6}\right|+c$

Answer: B

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12. $\int e^x\left[\frac{x^3+x+1}{(1+x^2)^{\frac{3}{2}}}\right]dx$

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

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

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

D. None of these

Answer: C

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13. If $f'(x)=4x^3-3x^2+2x+k$ and $f(0)=1, f(1)=4$ find $f(x)$

A. $x^4 - x^3 + x^2 + 2x + 1$

B. $x^4 - x^3 + x^2 + x + 2$

C. $x^4 - x^3 + x^2 + 2x + 2$

D. $x^4 - x^3 + x^2 + x + 1$

Answer: A

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14. $\int \frac{\cos x}{(1-\sin x)^3(2+\sin x)} dx =$

A.

$$-\frac{1}{27}\log|1-\sin x| - \frac{1}{9(1-\sin x)} + \frac{1}{6(1-\sin x)^2} - \frac{1}{27}\log|2+\sin$$

B.

$$\frac{1}{27}\log|1+\sin x| - \frac{1}{9(1+\sin x)} - \frac{1}{6(1-\sin x)^2} + \frac{1}{27}\log|2+\sin x|$$

C.

$$-\frac{1}{27}\log|1+\sin x| - \frac{1}{9(1-\sin x)} - \frac{1}{6(1-\sin x)^2} + \frac{1}{27}\log|2+\sin$$

D.

$$-\frac{1}{27}\log|1-\sin x|+\frac{1}{9(1-\sin x)}+\frac{1}{6(1-\sin x)^2}+\frac{1}{27}\log|2+\sin$$

Answer: D

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

A. $2\sin x+\log|\sec x+\tan x|+c$

B. $2\sin x-\log|\sec x-\tan x|+c$

C. $2\sin x-\log|\sec x+\tan x|+c$

D. $2\sin x+\log|\sec x-\tan x|+c$

Answer: C::D

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16. If $\int\sqrt{\frac{\cos x-\cos^3 x}{1-\cos^3 x}}dx=f(x)+c$, then $f(x)=$

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

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

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

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

Answer: B::C

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We Jee Previous Years Questions Category 1 Single Option Correct Type

1. $\int\frac{\log\sqrt{x}}{3x}dx$ is equal to

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

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

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

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

Answer: A

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2. $\int 2^x (f'(x) + f(x)\log 2)dx$ is equal to

A. $2^x f'(x) + c$

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

C. $2^x f(x) + c$

D. $2^x + c$

Answer: C

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3. $\int \cos(\log x)dx = F(x) + c$, where c is an arbitrary constant. Here F(x)=

A. $x[\cos(\log x) + \sin(\log x)]$

B. $x[\cos(\log x) - \sin(\log x)]$

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

D. $\frac{x}{2}[\cos(\log x) - \sin(\log x)]$

Answer: C

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4. $\int \frac{x^2 - 1}{x^4 + 3x^2 + 1}dx(x > 0)$ is

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

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

C. $\log_e\left|\frac{x + \frac{1}{x} - 1}{x + \frac{1}{x} + 1}\right| + c$

D. $\log_e\left|\frac{x - \frac{1}{x} - 1}{x - \frac{1}{x} + 1}\right| + c$

Answer: A

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5. If $\int e^{\sin x}\left(\frac{x\cos^3 x - \sin x}{\cos^2 x}\right)dx = e^{\sin x}f(x) + c,$

where c is constant of integration, then f(x)=`

A. $\sec x - x$

B. $x - \sec x$

C. $\tan x - x$

D. $x - \tan x$

Answer: B

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6. If $f(x)\sin x\cos x dx = \frac{1}{2(b^2 - a^2)}\log f(x) + c$, where c is constant of integration then $f(x) =$

A. $\frac{2}{(b^2-a^2)\sin 2x}$

B. $\frac{2}{|\in|2x}$

C. $\frac{2}{(b^2-a^2)\cos 2x}$

D. $\frac{2}{ab\cos 2x}$

Answer: C

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7. If $\int \cos x \log\left(\tan\frac{x}{2}\right)dx = \sin x \log\left(\tan\frac{x}{2}\right) + f(x)$ then f(x) is equal to, (assuming c is an arbitrary real constant)

A. c

B. $c - x$

C. $c + x$

D. $2x + c$

Answer: B

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8. $y = \int \cos\left[2\tan^{-1}\sqrt{\frac{1-x}{1+x}}\right]dx$ is an equation of a family of

A. straight lines

B. circles

C. ellipse

D. parabolas

Answer: D

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9. If $\int 2^{2^x}.2^x dx = A.2^{2^x} + c$, then A =

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

B. $\log 2$

C. $(\log 2)^2$

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

Answer: D

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10. Let $f(x)$be a derivable function, $f'(x) > f(x)$ and $f(0) = 0$. Then

A. $f(x) > 0 \quad \text{for all} \quad x > 0$

B. $f(x) < 0 \quad \text{for all} \quad x > 0$

C. no sign of f(x) can be ascertained

D. f(x) is a constant function

Answer: A

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We Jee Previous Years Questions Category 2 Single Option Correct Type

1. The value of $\int \frac{(x-2)dx}{\left\{(x-2)^2(x+3)^7\right\}^{1/3}}$ is

A. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)^{4/3}+c$

B. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)^{3/4}$

C. $\frac{5}{12}\left(\frac{x-2}{x+3}\right)^{4/3}+c$

D. $\frac{3}{20}\left(\frac{x-2}{x+3}\right)+c$

Answer: A

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