Vernacular

Ultimate KCETcrash course 2026

Maths

Integrals

DPP: 2

Q1 Evaluate : $\int \frac{1}{1+3\sin^2 x+8\cos^2 x} dx$

(A) $\frac{1}{6}\tan^{-1}(2\tan x)+c$

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

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

(D) None of these

Q2 $\int\left(1-\frac{1}{x^2}\right)\cdot e^{x+\frac{1}{x}}dx =$

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

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

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

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

Q3 $\int \frac{\sin 2x}{a^2+b^2\sin^2 x}dx =$

(A) $\frac{1}{b^2}\log\left|a^2+b^2\sin^2 x\right|+c$

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

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

(D) $\frac{1}{a^2+b^2}\log\left|a^2+b^2\sin^2 x\right|+c$

Q4 $\int \frac{\sec x}{2\cos x+5\sin x}dx =$

(A) $\frac{1}{2}\log|(2\cos x+5\sin x)|+c$

(B) $\frac{1}{5}\log|(2+5\tan x)|+c$

(C) $\frac{1}{2}\log|(2+3\tan x)|+c$

(D) $\frac{1}{3}\log|(2+5\tan x)|+c$

Q5 $\int \sin(\log x)dx =$

(A) $\frac{1}{2}x\left[\cos(\log x)-\sin(\log x)\right]$

(B) cos (log x) – x

(C) $\frac{1}{2}x\left[\sin(\log x)-\cos(\log x)\right]$

(D) –cos(log x)

Q6 $\int \cos^{-1}(4x^3-3x)dx =$

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

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

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

(D) $2\left[x\cos^{-1}x+\sqrt{1+x^2}\right]+c$

Q7 $\int \frac{\sin 2x}{\sin^4 x+\cos^4 x}dx =$

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

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

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

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

Q8 $\int \frac{\sec^2 x}{5+4\tan x}dx =$

(A) log |5 + 4 tan x| + c

(B) $\frac{-1}{5+4\tan x}+c$

(C) $\frac{1}{4}\log|5+4\tan x|+c$

(D) $-\frac{1}{4}\log|5+4\tan x|+c$

Q9 $\int \frac{e^x(1+x)}{\cos^2(xe^x)}dx =$

(A) $\tan(xe^x)+c$

(B) $\sec^2(ex^x)+c$

(C) $\cos(xe^x)+c$

(D) $\cot(xe^x)+c$

Q10 $\int x^5\cdot e^{x^2}dx =$

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

(B) $\frac{1}{2}x^4e^{x^2}+x^2e^{x^2}+e^{x^2}+c$

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

(D) None of these

Q11 $\int \frac{1}{(e^x+e^{-x})^2}dx =$

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

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

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

(D) None of these

Q12 $\int \frac{\sin x dx}{3+4\cos^2 x} =$

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

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

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

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

Q13 $\int \operatorname{cosec}^4 x\, dx =$

(A) $\cot x+\frac{1}{3}\cot^3 x+\frac{2x}{3}+c$

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

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

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

Q14 $\int \frac{\sqrt{\tan x}}{\sin x\cos x}dx =$

(A) $2\sqrt{\sec x}+c$

(B) $2\sqrt{\tan x}+c$

(C) $\frac{2}{\sqrt{\tan x}}+c$

(D) None of these

Q15 If $f(x)=\int \frac{5x^8+7x^6}{(x^2+1+2x^7)^2}dx (x \geq 0)$ and f(0) = 0, then the value of f(1) is:

(A) –1/2 (B) 1/2

(C) –1/4 (D) 1/4

Q16 Evaluate : $\int \frac{a}{(1+x^2)\tan^{-1} x}dx$

(A) a log |$\tan^{-1}$ x| + c

(B) a/2 $(\tan^{-1} x)^2$ + c

(C) a log $(1 + x)^2$ + c

(D) None of these

Q17 $\int \frac{dx}{e^x+e^{-x}+2}$ is equal to

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

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

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

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

Q18 $\int \left(\frac{\tan\frac{1}{x}}{x}\right)^2 dx$

(A) $x-\tan x+c$

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

(C) $\frac{1}{x}+\tan\left(\frac{1}{x}\right)+c$

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

Q19 $\int \sec^p x \tan x\, dx =$

(A) $\frac{\sec^{p+1} x}{p+1}+c$ (B) $\frac{\sec^p x}{p}+c$

(C) $\frac{\tan^{p+1} x}{p+1}+c$ (D) $\frac{\tan^p x}{p}+c$

Q20 $\int \frac{\cos x}{\sqrt[3]{\sin^2 x}}dx =$

(A) $3\sqrt[3]{\sin x}+c$ (B) $3\sqrt[3]{\sin^2 x}+c$

(C) $\sqrt[3]{\sin x}+c$ (D) $\sqrt[3]{\sin^2 x}+c$

Q21 $\int \cos^5 x\, dx =$

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

(B) $\sin x+\frac{2}{3}\sin^3 x+\frac{1}{5}\sin^5 x+c$

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

(D) None of these

Q22 $\int \frac{\sin^{10} x}{\cos^{12} x}dx =$

(A) $\frac{\tan^{11} x}{11}+c$ (B) $\frac{\tan^{10} x}{10}+c$

(C) 10 $\tan^9$ x + c (D) $\frac{\tan^9 x}{10}+c$

Q23 $\int \frac{\sin 2x}{4\cos^2 x+9\sin^2 x}dx =$

(A) $\frac{1}{13}\log(4\cos^2 x+9\sin^2 x)+c$

(B) $\frac{1}{12}\log(12\tan^2 x+9)+c$

(C) $\frac{1}{5}\log(4\cos^2 x+9\sin^2 x)+c$

(D) log (4 $\cos^2$ x + 9 $\sin^2$ x) + c

Q24 $\int \frac{3^x}{\sqrt{9^x-1}}dx =$

(A) $\frac{1}{\log 3}\log\left|3^x+\sqrt{9^x-1}\right|+c$

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

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

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

Q25 $\int \frac{x^2}{\sqrt{1-x^6}}dx =$

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

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

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

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

Q26 $\int \frac{dx}{1+e^x} =$

(A) log |1 + e^x| + c

(B) –log |1 + e^{-x}| + c

(C) –log |1 – e^{-x}| + c

(D) log |e^{-x} + e^{-2x}| + c

Q27 $\int \left(e^{x\log a}+e^{a\log x}+e^{a\log a}\right)dx$

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

(B) $\frac{a^x}{\log a}+\frac{x^{a+1}}{a-1}+ax^a+c$

(C) $\frac{a^x}{\log a}+\frac{x^a}{a+1}+ax^a+c$

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

Q28 $\int 2^{2^{2^x}} 2^{2^x} 2^x dx$

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

(C) $\frac{1}{(\log 2)^2}2^{2^x}+c$ (D) $\frac{1}{(\log 2)^4}2^{2^{2^x}}+c$

Q29 $\int e^{\tan^{-1}x}\left(\frac{1+x+x^2}{1+x^2}\right)dx$ is equal to

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

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

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

(D) None of these

Q30 Evalute the integral : $\int \frac{dy}{(y+6)(y+5)^{1/2}}$

(A) $2\tan^{-1}\left(\sqrt{(y+6)}\right)$+constant

(B) $2\tan^{-1}(y+6)+cons\tan t$

(C) $2\tan^{-1}\left(\sqrt{(y+5)}\right)$+constant

(D) $2\tan^{-1}(y+5)+cons\tan t$

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Answer Key

Q1	C	Q16	A
Q2	A	Q17	B
Q3	A	Q18	B
Q4	B	Q19	B
Q5	C	Q20	A
Q6	C	Q21	A
Q7	B	Q22	A
Q8	A	Q23	C
Q9	A	Q24	A
Q10	A	Q25	A
Q11	A	Q26	B
Q12	C	Q27	A
Q13	D	Q28	A
Q14	B	Q29	A
Q15	D	Q30	C

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Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

$I=\int \frac{1}{1+3\sin^2 x+8\cos^2 x}dx$

$=\int \frac{\sec^2 x}{\sec^2 x+3\tan^2 x+8}dx$

$=\int \frac{\sec^2 x}{4\tan^2 x+9}dx$

Put $\tan x=t$

$\sec^2 x\,dx=dt$

$I=\int \frac{dt}{4t^2+9}$

$=\frac{1}{4}\int \frac{dt}{t^2+9/4}$

$=\frac{1}{4}\frac{2}{3}\tan^{-1}\left(\frac{2t}{3}\right)+c$

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

Video Solution:

Q2 Text Solution:

By using the substitution

$x+\frac{1}{x}=t;\ then\ 1-\frac{1}{x^2}dx=dt$

Video Solution:

Q3 Text Solution:

Let I = $\int \frac{\sin 2x}{a^2+b^2\sin^2 x}dx$

$Now\ f(x)\ =\ a^2+b^2\sin^2 x;\ f'(x)$

$=b^2(\sin 2x)$

$then,$

$I=\frac{1}{b^2}\int \frac{b^2(\sin 2x)}{a^2+b^2\sin^2 x}dx$

$=\frac{1}{b^2}\log\left|a^2+b^2\sin^2 x\right|+C$

Video Solution:

Q4 Text Solution:

$\int \frac{\sec x}{2\cos x+5\sin x}dx=\frac{1}{5}\log|(2+5\tan x)|+c$

Video Solution:

Q5 Text Solution:

Let $I=\int \sin(\log x)dx$

Put log x = t $\Rightarrow\ x=e^t\ \Rightarrow\ dx=e^t\,dt$, then

$I=\int \sin t\cdot e^t\,dt=\sin t\cdot e^t-\int e^t\cdot\cos t\ dt$

$\Rightarrow\ 2I=\sin t\cdot e^t-\cos t$

$\cdot e^t\quad\left[\because I=\int e^t\sin t\ dt\right]$

$\Rightarrow\ I=\int \sin(\log x)dx$

$=\frac{1}{2}x\left[\sin(\log x)-\cos(\log x)\right]$

Video Solution:

Q6 Text Solution:

$$\int \cos^{-1}\left(4x^3 - 3x\right)dx$$

Let$x = \cos\theta$

$\Rightarrow \theta = \cos^{-1} x$

$\& dx = -\sin\theta d\theta$

$\therefore \int \cos^{-1}\left(4x^3 - 3x\right)dx = \int \cos^{-1}$

$\left(4\cos^3\theta - 3\cos\theta\right) \cdot (-\sin\theta)d\theta$

$= \int \cos^{-1}(\cos 3\theta)$

$\cdot(-\sin\theta)d\theta \left(\because \cos 3\theta = 4\cos^3\theta - 3\cos\theta\right)$

$= -3\int \theta \sin\theta d\theta$

$= \theta \int \sin\theta d\theta -$

$\int \left\{\frac{d}{d\theta}(\theta)\int \sin\theta d\theta\right\} d\theta$

$= 3\left[\theta(-\cos\theta) - \int 1 \cdot (-\cos\theta)d\theta\right]$

$= 3\theta\cos\theta - 3\sin\theta + C$

$= 3\cos^{-1} x \cdot x - 3\sqrt{1-x^2}$

$+ C(\because x = \cos\theta)$

Video Solution:

Q7 Text Solution:

$\int \frac{\sin 2x}{\sin^4 x+\cos^4 x}dx$

$= \int \frac{2\sin x\cos x}{\sin^4 x+\cos^4 x}\ dx = \int \frac{2\tan\ x\ \sec^2 x}{1+\tan^4 x}\ dx$

Put $\tan^2 x = t \Rightarrow 2\tan\ x\ \sec^2 x\ dx = dt,$

then it reduced to

$\int \frac{dt}{1+t^2} = \tan^{-1} t + c = \tan^{-1}\left(\tan^2 x\right) + c$

Video Solution:

Q8 Text Solution:

$Let\ f(x) = 5 + 4\tan x;\ f'(x) = sec^2 x$

$then,$

$I = \log|5 + 4\tan x| + C|$

Video Solution:

Q9 Text Solution:

By using the substitution

$xe^x = t;\ then\ (e^x(x+1))dx = dt$

$I = \int \frac{dt}{\cos^2 t} = \int sec^2 t\ dt = \tan t + C$

$= \tan(xe^x) + C$

Video Solution:

Q10 Text Solution:

Put $x^2 = t \Rightarrow 2xdx = dt$ then

$\int x^5 e^{x^2} dx = \frac{1}{2}\int t^2 e^t dt$

$= \frac{1}{2}\left[e^t t^2 - 2\int te^t dt\right] + c$

$= \frac{t^2 e^t}{2} - \left[te^t - e^t\right] + c = \frac{1}{2}x^4 e^{x^2} - x^2 e^{x^2}$

$+ e^{x^2} + c$

Video Solution:

Q11 Text Solution:

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

Put $e^{2x} + 1 = t \Rightarrow 2e^{2x} dx = dt,$ then it reduces to

$\frac{1}{2}\int \frac{1}{t^2} dt = -\frac{1}{2}\cdot\frac{1}{t} + c = -\frac{1}{2(e^{2x}+1)} + c$

Video Solution:

Q12 Text Solution:

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

Put cos x = t ⇒ sin x dx = –dt

$$\therefore I = \int \frac{-dt}{3+4t^2} = -\frac{1}{4}\int \frac{dt}{t^2+\left(\frac{\sqrt{3}}{2}\right)^2} dx$$

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

Video Solution:

Q13 Text Solution:

$$\int \operatorname{cosec}^4 x dx = \int \operatorname{cosec}^2 x \cdot \operatorname{cosec}^2 x dx$$

$$= \int \operatorname{cosec}^2 x \cdot (1+\cot^2 x)\, dx$$

$$[\because \operatorname{cosec}^2 x = 1+\cot^2 x]$$

$$= \int \operatorname{cosec}^2 x \cdot dx + \int \operatorname{cosec}^2 x \cot^2 x dx$$

$$\left[\because \int \operatorname{cosec}^2 x \cdot dx = -\cot x\right]$$

$$= -\cot x - \int t^2 dt$$

$$[\text{let } t = \cot x \Rightarrow dt = -\operatorname{cosec} x dx]$$

$$= -\cot x - \frac{t^3}{3} + C$$

$$= -\cot x - \frac{\cot^3 x}{3} + C$$

Video Solution:

Q14 Text Solution:

$$\int \frac{\sqrt{\tan x}}{\sin x \cos x} dx = \int \frac{\tan x}{\sqrt{\tan x} \sin x \cos x} dx$$

$$= \int \frac{\sin x \sec x}{\sqrt{\tan x} \sin x \cos x} dx = \int \frac{\sec^2 x}{\sqrt{\tan x}} dx$$

Put t = tan x $\Rightarrow dt = \sec^2 x\, dx$, then it reduces to

$$\int \frac{1}{\sqrt{t}} dt = 2t^{1/2} + c = 2\sqrt{\tan x} + c$$

Video Solution:

Q15 Text Solution:

$$\int \frac{5x^8+7x^6}{(x^2+1+2x^7)^2} dx$$

$$= \int \frac{5x^{-6}+7x^{-8}}{\left(\frac{1}{x^7}+\frac{1}{x^5}+2\right)^2} dx$$

$$\text{Put } \frac{1}{x^7} + \frac{1}{x^5} + 2 = t$$

$$\left(-7\frac{1}{x^8} - 5\frac{1}{x^6}\right) dx = dt$$

$$(7x^{-8} + 5x^{-6})\, dx = -dt$$

$$I = \int \frac{-dt}{t^2}$$

$$= \frac{1}{t} + c = \frac{1}{2+\frac{1}{x^5}+\frac{1}{x^7}} + C$$

As f(0)= 0, $f(x) = \frac{x^7}{2x^7+x^2+1}$

$$f(1) = \frac{1}{4}$$

Video Solution:

Q16 **Text Solution:**

$I=\int \frac{a}{(1+x^2)\tan^{-1}x}\,dx$

Put $\tan^{-1}x=t$

$\frac{1}{1+x^2}\,dx=dt$

$I=a\int \frac{dt}{t}$

$=a\log t+c$

$=a\ \log\ (\tan^{-1}x)+c$

Video Solution:

Q17 **Text Solution:**

$I=\int \frac{dx}{e^x+e^{-x}+2}=\int \frac{e^x\,dx}{(e^x+1)^2}$

Put $e^x+1=t$

$\int \frac{dt}{t^2}=\frac{-1}{t}+c=\frac{-1}{e^x+1}+c$

Video Solution:

Q18 **Text Solution:**

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

$Let,\ 1/x=t;\ then\ -\frac{1}{x^2}.dx=dt$

$\Rightarrow -\int \tan^2 t.dt=-\int(sec^2t-1)dt$

$=t-\tan t+C$

$=\frac{1}{x}-\tan\left(\frac{1}{x}\right)+C$

Video Solution:

Q19 **Text Solution:**

Put sec x = t $\Rightarrow$ sec x tan x dx = dt, therefore

$\int \sec^p x\ \tan\ x\ dx=\int t^{p-1}dt=\frac{t^p}{p}+c$

$=\frac{\sec^p x}{p}+c$

Video Solution:

Q20 **Text Solution:**

$\int \frac{\cos x}{\sqrt[3]{sin^2 x}}$

$Let, \sin x=t\Rightarrow \cos xdx=dt$

$Now,\ \int\frac{dt}{t^{\frac{2}{3}}}=3t^{1/3}+C$

$Hence,\ 3\sqrt[3]{sinx}+C$

Video Solution:

Q21 **Text Solution:**

$\int \cos^5 x\ dx=\int \cos^4 x\ \cos\ x\ dx=$

$\int(1-\sin^2 x)^2\cos x\ dx$

Put sin x = t $\Rightarrow$ cos x dx = dt, then it reduces to

$\int(1-t^2)^2dt=\int(1+t^4-2t^2)\ dt=\frac{t^5}{5}$

$-\frac{2t^3}{3}+t+c$

$=\frac{\sin^5 x}{5}-\frac{2\sin^3 x}{3}+\sin x+c$

Video Solution:

Q22 Text Solution:

$\int \frac{\sin^{10} x}{\cos^{12} x} dx = \int \tan^{10} x \, sec^2 x \, dx$

Let tanx = t

$sec^2 x dx = dt$

$I = \int t^{10} dt = \frac{t^{11}}{11} + C = \frac{\tan^{11} x}{11} + C$

Video Solution:

Q23 Text Solution:

$Let \ f(x) \ = 4\cos^2 x + 9\sin^2 x; \ f'(x)$

$= 5\sin(2x)$

$I = \frac{1}{5} \int \frac{5\sin(2x)}{4\cos^2 x + 9\sin^2 x} dx$

$then,$

$I = \frac{1}{5} \log|4\cos^2 x + 9\sin^2 x| + C|$

Video Solution:

Q24 Text Solution:

$\int \frac{3^x}{\sqrt{9^x - 1}} dx = \frac{1}{\log 3} \log\left|3^x + \sqrt{9^x - 1}\right| + c$

Video Solution:

Q25 Text Solution:

$\int \frac{x^2}{\sqrt{1-x^6}} dx = \frac{1}{3} \sin^{-1}\left(x^3\right) + C$

Video Solution:

Q26 Text Solution:

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

Put $1 + e^{-x} = t \Rightarrow e^{-x} dx = -dt$, then it reduces to

$-\int \frac{dt}{t} = -\log|t| = -\log|1 + e^{-x}| + c$

Video Solution:

Q27 Text Solution:

$I = \int e^{x \log a} + e^{a \log x} + e^{a \log a} dx$

$= \int e^{\log a^x} + e^{\log x^a} + e^{\log a^a} dx$

$= \int a^x + x^a + a^a dx = \frac{a^x}{\log a} + \frac{x^{a+1}}{a+1} + a^a x$

$+ c$

Video Solution:

Q28 Text Solution:

$I = \int \left(2^{2^{2^x}}\right) 2^{2^x} \cdot 2^x dx$

$\text{Put } 2^{2^x} = t$

$2^x \log 2 = \log \ t$

$2^x \, dx = \frac{1}{t(\log \ 2)^2} dt$

$I = \int \frac{2^t t}{t(\log \ 2)^2} dt$

$I = \int \frac{2^t}{(\log \ 2)} dt$

$I = \frac{2^t}{(\log 2)^3} + c$

$I = \frac{2^{2^{2^x}}}{(\log \ 2)^3} + c$

Video Solution:

Q29 Text Solution:

Putting $\tan^{-1}x = t$ *and* $\frac{dx}{1+x^2} = dt$ *we get*

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

$$e^t\left(\tan t + \sec^2 t\right)dt$$

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

$$\left[\text{Using } \int e^x\left\{f(x)+f'(x)\right\}dx = e^x f(x)+C\right]$$

Video Solution:

Q30 Text Solution:

$$I = \int \frac{dy}{(y+6)(y+5)^{1/2}}$$

Put $(y+5)^{1/2} = t$

$y + 5 = t^2$

$y + 6 = t^2 + 1$

$dy = 2t\ dt$

$\therefore\ I = 2\int \frac{1}{t^2+1}dt = 2\tan^{-1}(t)+c$

$= 2\tan^{-1}\left[(y+5)^{1/2}\right]+c$

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