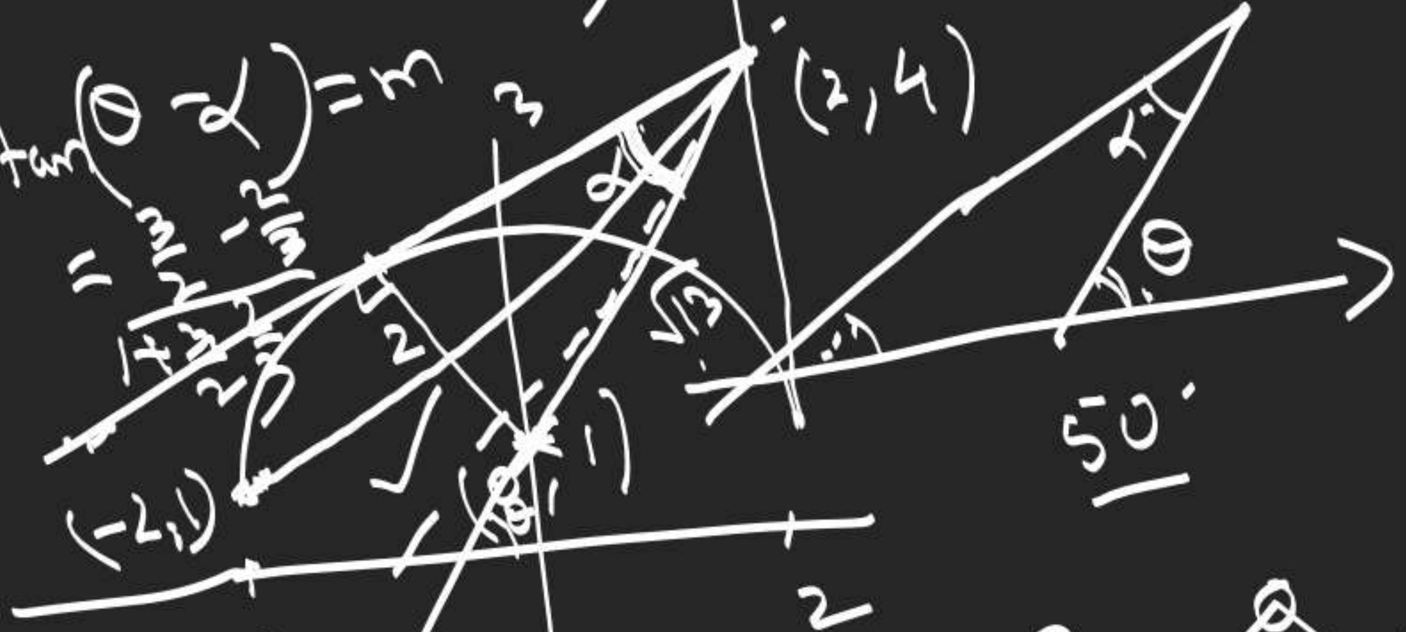
Nishant Jindal

$\tan\theta = \frac{3}{2}$

$\tan\alpha = \frac{2}{3}$

$\tan(\theta - \alpha) = m$

$= \frac{\frac{3}{2} - \frac{2}{3}}{1 + \frac{3}{2}\cdot\frac{2}{3}}$



1714

50

$\int x^2 \sqrt[5]{x^3+2}\, dx$

$\boxed{f(x+1) = 2f(x)}$

$m \neq -1$ ✓

$m = -1$ ✓

$f(a) \sum_{k=1}^{n} f(k)$

$2(2^n - 1) f(a)$

$\boxed{8}$

$\left(\frac{5}{12}, \frac{3}{4}\right]$

$[f(1), f(-1)]$

$x \in (x_0 - \delta, x_0 + \delta)$

Nishant Jindal

$\boxed{2\overset{(c)}{3}1}$

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}\begin{bmatrix} a & b \\ c & d \end{bmatrix} = \begin{bmatrix} a^2+bc & (a+d)b \\ c(a+d) & cb+d^2 \end{bmatrix}$$

$a^2+bc=1$ ✓

$(a+d)b=0$

$c(a+d)=0$

$cb+d^2=1$ ✓

$\underline{a+d=0}$ or $a+d\neq 0$

$a(-d)+bc=1$

$b=0$

$c=0$

$a^2=1$

$d^2=1$

$(a,d)=(1,1)$

$(-1,-1)$

$$P^2(P-Q)=Q^2(Q-P)$$
$$=-Q^2(P-Q)$$
$$(P^2+Q^2)(P-Q)=0$$

$\underline{41\text{'s}}$

$\boxed{6\times 6}$

$$A^{-1}A^T A(A^{-1})^T$$
$$A^{-1}A\,A^T(A^T)^{-1}=I$$

$$\begin{vmatrix} a_1 & a_2 & a_3 \\ b_1 & b_2 & b_3 \\ c_1 & c_2 & c_3 \end{vmatrix} = \boxed{a_1b_2c_3} - a_1b_3c_2 - a_2b_1c_3 + a_2b_3c_1 + a_3b_1c_2 - a_3b_2c_1$$

Nishant Jindal

1. $\int (\tan^3 x - x\tan^2 x)\,dx = \int \tan^2 x(\underbrace{\tan x - x}_{=t})\,dx = \int t\,dt$.

$= \frac{(\tan x - x)^2}{2} + C$. $\quad dt = (\sec^2 x - 1)\,dx = \tan^2 x\,dx$.

2. $\int \frac{\sec^4 x\,dx}{\sqrt{\tan x}} = \int \frac{(1+\tan^2 x)\sec^2 x\,dx}{\sqrt{\tan x}} = \int \left(\frac{1}{\sqrt{\tan x}} + \tan^{3/2} x\right)\sec^2 x\,dx$

$= 2\sqrt{\tan x} + \frac{2}{5}(\tan x)^{5/2} + C$

QE, Seq, Comp Angle, Trig. Eqn.

SOT

Determinant

3. $\int \frac{\ln^2\left(\frac{x}{x+1}\right)dx}{x(x+1)} = \int t^2\,dt = \frac{1}{3}\ln^3\left(\frac{x}{x+1}\right) + C$

$\left(\frac{1}{x} - \frac{1}{x+1}\right)dx = dt$

$\tan^2 x = t$.

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

$\sec^2 x\,dx = \frac{1}{2t}dt$.

$\int \left(\frac{1+t^4}{t}\right)\frac{dt}{2t}$

Nishant Jindal

4. $$\frac{1}{(a-b)}\int\frac{(a-b)\sin 2x\,dx}{\left(a\sin^2 x+b\cos^2 x\right)^2} = -\frac{1}{(a-b)\left(a\sin^2 x+b\cos^2 x\right)}+C.$$

$$\int\frac{dt}{t^2}$$

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

Nishant Jindal

6. $\int \left(\frac{\tan x+\sec x-1}{\tan x-\sec x+1}\right)dx$ $\quad \sec^2 x-\tan^2 x$ $= \int (\tan x+\sec x)\,dx = \ln|\sec x| + \ln|\sec x+\tan x| + C.$

7. $\int \frac{dx}{(\sqrt{3}\sin x+\cos x)} = \int \frac{dx}{2\sin\left(x+\frac{\pi}{6}\right)} = \frac{1}{2}\ln\left|\tan\left(\frac{x}{2}+\frac{\pi}{12}\right)\right| + C.$

8. $\int \frac{dx}{\sin x\cos^2 x} = \int \frac{\sin^2 x+\cos^2 x}{\sin x\cos^2 x}\,dx = \int \left(\tan x\sec x + \operatorname{cosec} x\right)dx$

$\int \frac{\sin x\, dx}{(1-\cos^2 x)\cos^2 x} = \int\left(\frac{1}{1-\cos^2 x}+\frac{1}{\cos^2 x}\right)\sin x\,dx$

$= \sec x + \ln|\operatorname{cosec} x-\cot x| + C.$

Nishant Jindal

9. $\displaystyle\int \frac{dx}{\sec x+\operatorname{cosec} x} = \frac{1}{2}\int \frac{2\sin x\cos x\,dx}{(\sin x+\cos x)} = \frac{1}{2}\int \frac{\left((\sin x+\cos x)^2-1\right)dx}{(\sin x+\cos x)}$

$\boxed{\text{Ex-V } (1-15)}$ $\displaystyle = \frac{1}{2}\int\left(\sin x+\cos x - \frac{1}{\sqrt{2}}\operatorname{cosec}\left(x+\frac{\pi}{4}\right)\right)dx$

1751-80 $\boxed{\text{P-2}}$ $\displaystyle = \frac{1}{2}\left(-\cos x+\sin x - \frac{1}{\sqrt{2}}\ln\left|\tan\left(\frac{x}{2}+\frac{\pi}{8}\right)\right|\right)+C.$

10. $\displaystyle\int \frac{1.\,dx}{(e^x+1)} = -\int\frac{-e^{-x}\,dx}{1+e^{-x}} = -\ln|1+e^{-x}|+C.$

$\displaystyle = \int\left(\frac{(1+e^x)-e^x}{(e^x+1)}\right)dx = \int\left(1-\frac{e^x}{1+e^x}\right)dx = x-\ln|1+e^x|+C$

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

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

$2(e^x+1)-(2e^x+1)$

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

Nishant Jindal

Nishant Jindal

Nishant Jindal

Nishant Jindal

Nishant Jindal

Nishant Jindal

Nishant Jindal

Nishant Jindal