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Hint:

Q (Mains) $\int \frac{5\tan x}{\tan x - 2}\,dx = \int \frac{5\sin x}{\sin x - 2\cos x}\,dx$

$5\sin x = \lambda(\sin x - 2\cos x) + \mu(\sin x - 2\cos x)'$

Q (Mains) If $f\left(\frac{x-4}{x+2}\right) = 2x+1$ then $\int f(x)\,dx = ?$

$\frac{x-4}{x+2} = t \Rightarrow x - 4 = tx + 2t \Rightarrow x(t-1) = -4-2t$

$x = \frac{2t+4}{1-t}$

$f(t) = 2\frac{(2t+4)}{1-t} + 1$

$\int f(x)\,dx = \int \frac{4x+8+1-x}{1-x}\,dx = \int \frac{3x+9}{1-x}\,dx$

$\int \frac{}{S^4 + C^4} \div C^4$

$\int \frac{}{S^6 + C^6} \div C^6$

Q (Mains) $\int \frac{\sin^2 x \cdot \cos^2 x \cdot dx}{(\sin^5 x + \cos^3 x \cdot \sin^2 x + \sin^3 x \cdot \cos^2 x + \cos^5 x)^2}$

$\int \frac{S^2 C^2 \cdot dx}{(S^2(S^3 + C^3) + C^2(S^3 + C^3))^2}$

$\int \frac{S^2 \cdot C^2 \cdot dx}{((S^3 + C^3)(S^2 + C^2))^2} = \int \frac{S^2 C^2}{(S^3 + C^3)^2}$

$\rightarrow S^6, C^6$

$\div \cos^6 x$

$\int \frac{\tan^2 x \cdot \sec^2 x \cdot dx}{(1 + \tan^3 x)^2}$

$1 + \tan^3 x = t$

Solve Yourself

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Q (Main) $\int x^5 \cdot e^{-4x^3} \cdot dx =$

$\int x^2 \cdot x^3 \cdot e^{-4x^3} \cdot d$

$-4x^3 = t$

Q. (Mains) $\int x^5 \cdot e^{-x^2} \cdot dx$

$-x^2 = t$

Q (Mains) $\int \frac{\tan x + \tan \alpha}{\tan x - \tan \alpha} \cdot dx \rightarrow \frac{S}{C}$

$\int \frac{\sin(x+\alpha) \cdot dx}{\sin(x-\alpha)}$

DY

Q (Mains) $\int \frac{d\theta}{\cos^2\theta(\tan 2\theta + \sec 2\theta)}$

$\int \frac{\sec^2\theta \cdot d\theta}{\left(\frac{2\tan\theta}{1-\tan^2\theta} + \frac{1+\tan^2\theta}{1-\tan^2\theta}\right)}$

Q $\int (e^{2x} + 2e^{x} - e^{-x} - 1) \cdot e^{(e^{-x}+e^{x})} \cdot dx = g(x) \cdot (e^{x} + e^{-x}) + C$

$\underbrace{e^{2x} + 2e^{x} - e^{-x} - 1 \cdot e^{(e^{-x}+e^{x})} = g(x) \cdot (e^{x} - e^{-x}) + (e^{x} + e^{-x}) g'(x)}$

<<<group>>>

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Q 85 $\tan x = t$
(copy)

Q 84 copy

Q 83 copy (f xn → fog)

Q 82 → Bdi Bdi deg.

Q 68 → T_2

Q 69 $x - \frac{\pi}{4} = t$

Q 70 ✓

71 → IBP (finest)

Q 72 $\int e^{x+\frac{1}{x}}\left(1+x-\frac{1}{x}\right)dx$

$\int e^{x}\cdot\left(e^{\frac{1}{x}} + \boxed{x\cdot e^{\frac{1}{x}}} - \frac{1}{x}\cdot e^{1/x}\right)dx = e^{x}\cdot x\cdot e^{1/x} = x\cdot e^{x+1/x}+C$

f

$(x\cdot e^{\frac{1}{x}})' = x\cdot e^{\frac{1}{x}}\times -\frac{1}{x^2} + e^{\frac{1}{x}}\cdot 1$

$= e^{\frac{1}{x}} - \frac{1}{x}\cdot e^{\frac{1}{x}}$

73) Bdi Bdi deg.

74) Bdi " "

(75) $I_n = \int \tan^n x\cdot dx$ $\quad I_4 + I_6$ $\xrightarrow{} 2$

$I_{n+2} = \int \tan^{n+2} x\, dx$

$I_n + I_{n+2} = \int \tan^n x + \tan^{n+2} x\, dx \longrightarrow I_4 + I_6 = \frac{\tan^5 x}{5} + C$

$= \int \tan^n x \sec^2 x\cdot dx$ $\quad = a\tan^5 x + bx^5 + C$

$= \int t^n = \frac{t^{n+1}}{n+1} = \frac{\tan x^{n+1}}{n+1} + C$

$a = \frac{1}{5}, \; b = 0$

$\left(\frac{1}{5}, 0\right)$