Prepa Tec
Calculus II

Campus Cumbres
2st partial Quiz # 2A

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I . Solve the following integrals. SHOW THE STEPS OF YOUR PROCEDURE. (20 points each)

1. $\int Sin^3(2x)\,dx = \int \sin(2x)[\sin(2x)]^2 dx = \int \sin(2x)[1-\cos^2(2x)]dx = \int \sin(2x) - \int \sin(2x)\cos^2(2x) =$

$u = 2x$
$du = 2$

$\boxed{\frac{-\cos(2x)}{2} + \frac{\cos^3(2x)}{6} + C}$

$\left[\frac{\cos(2x)}{6}\right]^3$

$u = \cos(2x)$
$du = -2\sin(2x)$

$y' = 3\left[\frac{\cos(2x)}{6}\right]^2$

$u = \cos(2x)$ $u = 6$
$du = -2\sin(2x)$ $du = 0$

$\sin 2x +$

$\sin^2(2x) = 1 - \cos^2(2x)$

2. $\int x^6 \cos^2(x^7)\,dx = \int x^6\left[\frac{1}{2}[1+\cos 2(x^7)]\right]dx = \frac{1}{2}\int x^6[1+\cos 2(x^7)]dx = \frac{1}{2}\int x^6 + x^6\cos 2(x^7)\,dx =$

$\frac{1}{2}[1+\cos 2u]$

Not possible!

$\int \frac{x^6}{2} + \int \frac{x^6\cos 2(x^7)}{2} = \int \frac{x^6}{2} + \int x^6\cos(x^7) = \boxed{\frac{x^7}{14} + \frac{\sin(x^7)}{x_{28}} + C}$

$(2x^7)$

$u = x^7$
$du = 7x^6$

3. $\int 9x^4 \tan^3(x^5)\,dx = 9\int x^4\tan^3(x^5)dx = 9\int x^4 \tan x^5 [\tan(x^5)]^2 = 9\int x^4 \tan x^5 [\sec^2 x^5 - 1] =$

substitution catalog

$9\int x^4 \tan x^5 \sec^2 x^5 - 9\int x^4 \tan x^5 = 9\int \frac{\tan x^5}{5} - 9\int x^4 \tan x^5 = \boxed{\frac{9\tan x^5}{10} + \frac{9\ln|\cos x^5|}{5} + C}$

$u = \tan x^5$
$du = 5x^4 \sec^2 x^5$

$u = x^5$
$du = 5x^4$

4. $\int x^3 sin^2(x^4)dx = \int x^3\left[\frac{1}{2}\left[1-\cos 2(x^4)\right]\right]dx = \frac{1}{2}\int x^3\left[1-\cos 2(x^4)\right]dx = \frac{1}{2}\int x^3 - x^3\cos 2(x^4)\,dx =$

$\int\frac{x^3}{2} - \int\frac{x^3\cos\cancel{2}(x^4)}{\cancel{2}} = \int\frac{x^3}{2} - \int \cancel{x^3}\cos(x^4) = \boxed{\frac{x^4}{8} - \frac{\sin x^4}{4} + C}$

$u = x^4$

$du = 4x^3$

5. $\int Cot^2(5x)dx = \int\left[\csc^2(5x) - 1\right]dx = \int\csc^2(5x) - \int 1 = \boxed{\frac{-\cot 5x}{5} - x + C}$

$u=5x$

$du=5$

8 **BONUS (8 POINTS)**

$\int Cos^5(3x)dx = \int\cos(3x)\left[\cos^2(3x)\right]^2dx = \int\cos(3x)\left[\left[1-\sin^2(3x)\right]\left[1-\sin^2(3x)\right]\right]$

$\int\cos(3x)\left[1-\sin^2(3x)-\sin^2(3x)+\sin^4(3x)\right] = \int\cos(3x)\left[1-2\sin^2(3x)+\sin^4(3x)\right] =$

$\int\cos(3x) - \int -2\cancel{\cos(3x)}\sin^2(3x) + \int\cancel{\cos(3x)}\sin^4(3x)$

$u=3x$ $\quad u=\sin(3x)$

$du=3$ $\quad du=3\cancel{\cos(3x)}$

$\boxed{\frac{\sin(3x)}{3} + \frac{2\sin^3(3x)}{9} + \frac{\sin^5(3x)}{15} + C}$