sin= csc   tan= sin/cos   cot = cos/sin
cos = sec
tan= cot

100

Prepa Tec
Campus Cumbres

Calculus II
2nd partial Quiz #1A

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I. Determine if the following propositions are True (T) or False(F) (5 points each):

u=3x
du=3

1. (T) Having $\int(\sin x+\cos x)dx$ is the same as having $\int(\sin x)dx+\int(\cos x)dx$
2. (T) The answer for $\int 6\frac{\csc(3x)}{\sin(3x)}dx$ is $-2\cot(3x)+C$ $\int 6\left[\frac{\csc(3x)}{\frac{1}{\csc(3x)}}\right]dx = \int 6\left[\csc^2(3x)\right]dx = -2\cot(3x)+C$
3. (T) $\int x(x^2+3)^2dx=\frac{1}{6}(x^2+3)^3+C$ u= x²+3   du= 2x $= \left[\frac{1}{2}\right](x^2+3)^{2+1=3}$ $\frac{(x^2+3)^3}{6}+C$
4. (F) $\int(x^2-3)\tan(x^2-3x)dx=-\ln|\cos(x^2-3x)|+C$
5. (F) The integral of $\int(2\sin 3x+3x)dx$ is $-6\sin 3x+3+C$ $\int 2\sin 3x + \int 3x =$ no

II. Solve the following exercises, show ALL your procedure and frame your final answer. (15 points each).

If the equation of acceleration of an object is $a(t)=\frac{3}{t-4}$ and the velocity at t =5 is 8 m/s, then find the equation that determines the velocity of the object at any time '*t*'.

$a(t)=\frac{3}{t-4}$ u= t-4   du= 1

$a(t)=3(t-4)^{-1}$

$a(t)=3[(t-4)^{-1}]$ 8 = 0 + c

$V(t)=3\ln|t-4|+C$

$V(5)=3\ln|5-4|+C$

$V(5)=3\ln|1|+C$

$\boxed{V(t)=3\ln|t-4|+8}$

u= t-4
du= 1

$y=\ln u \quad y'=\frac{u'}{u} = \frac{3}{t-4}$

III. Find the antiderivative or integral of the following problems. SHOW YOUR ENTIRE PROCEDURE. (15 pts each)

1- $h(x)=96Sin^2(2x+\pi)Cos(2x+\pi)$

$h(x)=\frac{96}{2}\left[\frac{\sin^2(2x+\pi)\cos(2x+\pi)}{4}\right]$

u = sin (2x+π)

du= 2cos (2x+π)

$H(x)= 48[\sin(2x+\pi)]^{2+1}$
3

$\boxed{H(x)=16\sin^3(2x+\pi)+C}$

positive?

$y=16\left[\sin^3(2x+\pi)\right]+c$ $u=[\sin(2x+\pi)]^3$

$du=3[\sin(2x+\pi)]^2[2\cos(2x+\pi)]$

$y'=96\sin^2(2x+\pi)\cos(2x+\pi)$ $du=6\sin^2(2x+\pi)\cos(2x+\pi)$

2- $v(t)=\dfrac{e^{5/t}}{3t^2}$ $\quad V(t)=\dfrac{e^{5/t}}{3}t^{-2}$ $\quad V(t)=\dfrac{e^{5t^{-1}}}{3}\cancel{t}^{-2}$ $\quad V(t)=\dfrac{1}{3}\left[e^{5t^{-1}}t^{2}\right]$

$u=5t^{-1}$

$du=-5t^{-2}$

$\boxed{V(t) \text{ or } x(t)=-\dfrac{e^{5/t}}{15}+C}$

$u=5t^{-1}$

$du=-5t^{-2}$

$y'=-5t^{-2}\left[\dfrac{-e^{5/t}}{15}\right]$

$y'=\dfrac{e^{5t}}{3t^2}$

3- $\int 3x\,Cot\left(6x^2-1\right)Sin\left(6x^2-1\right)dx$

$u=6x^2-1$

$du=12x$

$\int 3x\left[\cot(6x^2-1)\sin(6x^2-1)\right]dx=$

$\int 3x\left[\dfrac{\cos(6x^2-1)}{\cancel{\sin(6x^2-1)}}\cancel{\sin(6x^2-1)}\right]dx=$

$12x\left[\dfrac{\cos(6x^2-1)}{4}\right]=3x\left[\cos(6x^2-1)\right]$

$\int 3x\left[\cos(6x^2-1)\right]dx=\dfrac{3}{12}\left[\sin(6x^2-1)\right]=\boxed{\dfrac{\sin(6x^2-1)}{4}+C}$

$u=6x^2-1$

$du=12x$

4- $\int 7\sec(3x)\tan(3x)\,dx$

$\int 7\left[\sec(3x)\tan(3x)\right]dx=\boxed{\dfrac{7\sec(3x)}{3}+C}$

$u=3x$

$du=3$

$\cancel{3}\left[\dfrac{7\sec(3x)\tan(3x)}{\cancel{3}}\right]$

$u=3x$

$du=3$