Prepa Tec
Campus Cumbres

Calculus II
2nd partial Quiz #1A

97 excellent!!

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

1. (F) Having $\int(\sin x+\cos x)dx$ is the same as having $\int(\sin x)dx\int(\cos x)dx$
2. (F) The answer for $\int 6\frac{\csc(3x)}{\sin(3x)}dx$ is $2\cot(3x)+C$
3. (F) $\int x(x^2+3)^2dx=\frac{1}{6}(x^2+3)^2+C$
4. (F) $\int(x^2-3)\tan(x^2-3x)dx=-\ln\left|\cos(x^2-3x)\right|+C$
5. (F) The integral of $\int(2\sin 3x+3x)dx$ is $-6\cos 3x+3x+C$

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 $a(t)=\frac{7}{t-5}$ and the velocity at t =10 seconds is 13 m/s, then find the equation that determines the velocity of the object at any time '*t*'.

$a(t)=\frac{7}{t-5}$

$\frac{7}{t-5}$ $u=t-5$ $du=1$

$7\ln|t-5|+C$

$v(10)=13$

$13-11.26$

1.73

$\boxed{v(t)=7\ln|t-5|+1.7339}$

15

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

1- $h(x)=-36Sin^2(5x+\pi)Cos(5x+\pi)$

$h(x)=-36\sin^2(5x+\pi)(\cos(5x+\pi)$

$u=\sin(5x+\pi)$

$du=5\cos(5x+\pi)$

$-36\sin^3(5x+\pi)$

3

$\boxed{H(x)=\frac{-12}{5}\sin^3(5x+\pi)+C}$

12

4. $\int x^3 \sin^2(x^4)\,dx$

$x^3\left(\frac{1}{2} - \frac{1}{2}\cos(2x^4)\right)$

$\frac{x^3}{2} - \frac{x^3}{2}\cos(2x^4)$ $u = 2x^4$ $du = 8x^3$

$\frac{x^4}{8} - \frac{1}{16}\sin(2x^4) + C$ ✓

5. $\int \cot^2(5x)\,dx = -\frac{1}{5}\cot(5x) - x + C$ ✓

$(\cot(5x))^2$ $\left(\frac{1}{\tan(5x)}\right)^2$ $\frac{\cos^2}{\sin^2}$ $\frac{1-\sin^2}{\sin^2}$ $\frac{1}{\sin^2} - 1$ $\csc^2 - 1$

$\frac{1}{\tan} \cdot \frac{1}{\tan} = \frac{1}{\tan^2}$ $\frac{1}{2}$ $\frac{\cos^2(5x)}{\sin^2(5x)}$ $\frac{\cos \cdot \cos}{\sin}$ $u = 5x$ $du = 5$

$\frac{1}{\sec^2 - 1}$ $(\sec^2 - 1)^{-1}$ $1 + \cot = \cos$ $u = \sin(5x)$ $-\frac{1}{5}\cot(5x) - x + C$

$du = 5\cos(5x)$

$\frac{\cos}{\sin}$ $\frac{\cos}{\tan \sin}$ $\frac{\cot}{\tan}$ $\frac{\cos \csc}{\tan}$

BONUS (8 POINTS)

$\int \cos^5(3x)\,dx$