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Prepa Tec
Campus Cumbres

Calculus II
2nd partial Quiz #1A

Name Alejandra Islas I.D. A01570159 Date: 23/02/18

**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 $2\cot(3x)+C$ $\frac{\csc(3x)}{1} \div \frac{1}{\csc(3x)} = \csc^2(3x)$ $-2\cot(3x)+c$

3. ( F ) $\int x(x^2+3)^2\,dx=\frac{1}{6}(x^2+3)^2+C$ $x^5+6x^3+9x = x^6/6+\frac{6x^4}{4}+\frac{9x^2}{2}+c$

4. ( F ) $\int(x^2-3)\tan(x^2-3x)dx=-\ln|\cos(x^2-3x)|+C$ $du = 2x-3$

5. ( F ) The integral of $\int(2\sin 3x+3x)dx$ is $-6\cos 3x+3x+C$ $-\frac{2}{3}\cos(3x)+\frac{3x^2}{2}+c$ $du=3$

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**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'*.

$u=t-5$
$du=1$

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

$13=7\ln|10-5|+C$
$13=7\ln|5|+C$
$13=11.266+C$
$C=1.734$

$v(t)=7\ln|t-5|+1.734$

$v(t)=7\ln|t-5|+1.734$

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

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

$(\sin(5x+\pi))^2$

$u=5x+\pi$ $du=5$

$\ln u$

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

$h(x)=-36\int\frac{1}{2}(1-\cos 2(5x+\pi))du+\int -36\cos(5x+\pi)$

$=-36\int\frac{1}{2}(1-\cos(10x+2\pi))du$ $-\frac{36}{5}\sin(5x+\pi)$

$u=10x+2\pi$
$du=10$

$-18\int(x-\frac{1}{10}\sin(10x+2\pi)+C$

$-18(x-\frac{1}{10}\sin(10x+2\pi)+C$

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$-18(x-\frac{1}{10}\sin(10x+2\pi)-\frac{36}{5}\sin(5x+\pi)+C$ X

CORRECTION

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

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

$h(x)=-36\,\frac{(\frac{1}{5}\sin(5x+\pi))^3}{3}$

$h(x)=\frac{-36\sin(5x+\pi)^3}{15}+c$

2- $v(t) = \frac{e^{3/t}}{9t^2}$

$v(t) = 9t^{-2} e^{3t^{-1}}$

$u = 3t^{-1}$

$du = -3t^{-2}$

$-3e^{3/t} + C$

$-3e^{3/t} + C$

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CORRECTION

$v(t) = \frac{1}{9}t^{-2} e^{3t^{-1}}$

$u = 3t^{-1}$ $du = -3t^{-2}$

$\frac{1}{27} e^{3/t} + C$

3- $\int \frac{x}{12} Cot(6x^2 - 1) Sin(6x^2 - 1) dx$

$\int \frac{x}{12} \cot(6x^2-1) + \int \frac{x}{12} \sin(6x^2-1)$

$u = 6x^2 - 1$ $u = 6x^2$

$du = 12x$ $du = 12x$

$\frac{1}{144} \ln|\sin(6x^2-1)| - \frac{1}{144} \cos(6x^2-1) + C$

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$\int \frac{\cos}{\sin} \sin = \int \cos dx$

CORRECTION

$\int \frac{x}{12} \left( \frac{\cos}{\sin}(6x^2-1) \cdot \sin(6x^2-1) \right)$

$\int \frac{x}{12} \cos(6x^2-1)$

$u = 6x^2 - 1$ $du = 12x$

$\frac{1}{144} \sin(6x^2-1) + C$

4- $\int 5 \sec(10x) \tan(10x) dx$

$u = 10x$

$du = 10$

$\frac{1}{2} \sec(10x) + C$

$\frac{1}{2} \sec(10x) + C$

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