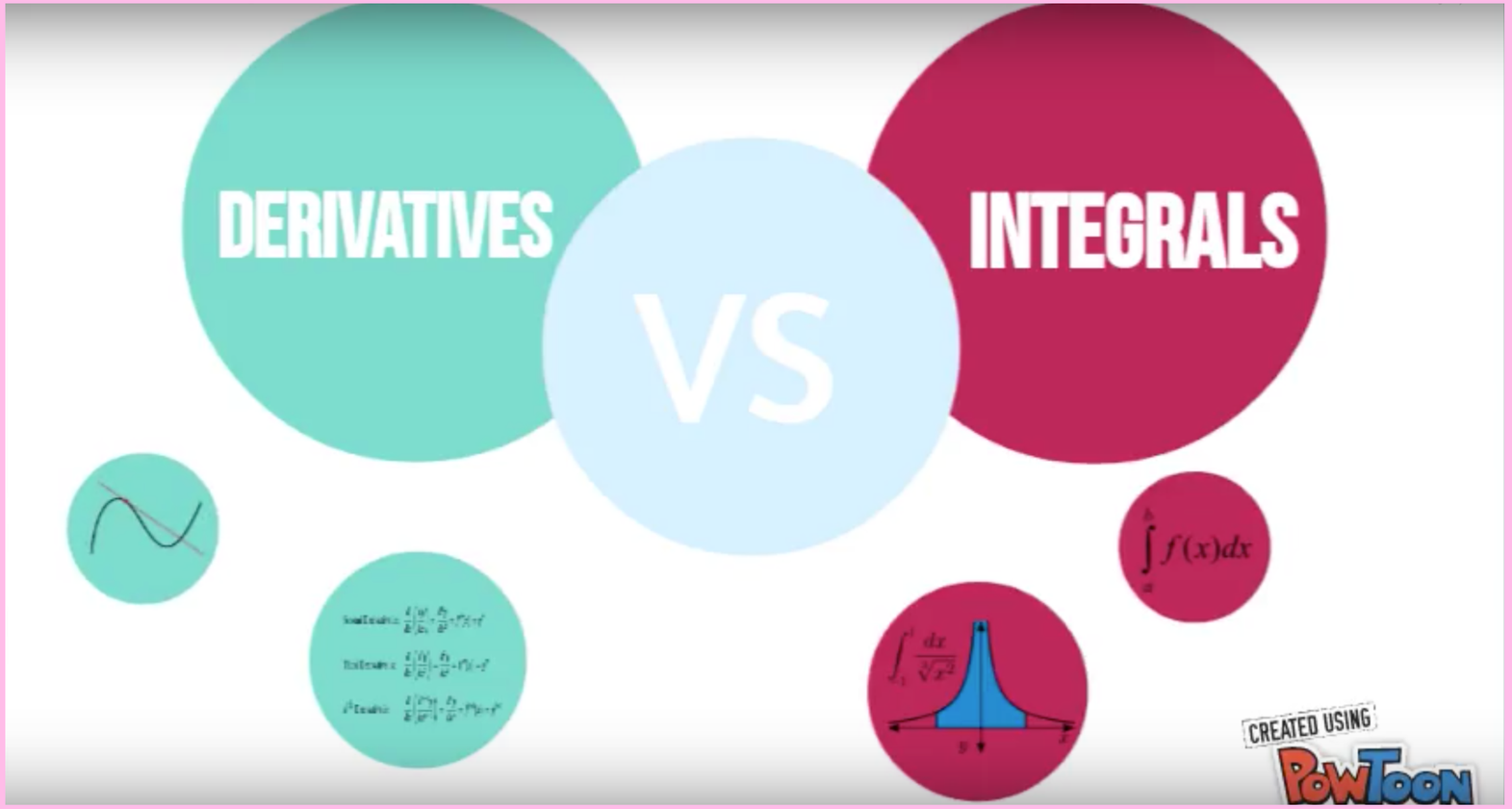
CALCULUS II

E-PORTAFOLIO

KAREN BARAJAS A01570322

FIRST PARTIAL PROJECT



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SECOND PARTIAL PROJECT

Karen Barajas A01570322
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Proyecto 2do Parcial: Movimiento de un móvil a lo largo de una trayectoria rectilínea y circular

Objetivo:

Determinar los conceptos básicos de un movimiento circular a partir de cálculo.

Instrucciones:

En equipos de 2 personas realizarás la siguiente actividad (para alumnos de cálculo II, sólo aplica las instrucciones en rojo y los valores de aceleración y velocidad asignados en clase.

1. Leer detenidamente el caso práctico de un auto y el Expreso Tec que viajan sobre la Av. Paso de los Leones en dirección Pte.
2. Evaluar en base a los datos dados y usando cálculo el recorrido de la trayectoria rectilínea
3. Determinar las ecuaciones utilizando integrales y/o derivadas (conceptos vistos en clase) y los valores que se te piden

Un auto está esperando el cambio de luz verde del semáforo, del cruce de Av. Paseo de los Leones y Calle Cima, cuando esto sucede, el carro empieza a moverse con una aceleración constante de 7 ft/s2. Un autobús Expreso Tec viaja en la misma dirección con una velocidad constante de 25 ft/s, sobrepasando al auto.



Formato de entrega:

INTRODUCCIÓN

Las integrales se utilizan para saber el área de la curva de una función, se expresan mediante el símbolo de integrales $\int$, nos permiten saber la antiderivada, es decir lo contrario de la derivada, de cualquier función, en este caso una función de movimiento. Existen dos tipos de movimientos: movimiento rectilíneo uniforme y movimiento rectilíneo uniformemente acelerado. Ambos consisten en un recorrido sobre una trayectoria en línea recta. En el movimiento rectilíneo uniforme (MRU) se evaluan aspectos como la velocidad, el tiempo y la distancia. La velocidad expresa la distancia recorrida en cierto tiempo. El movimiento rectilíneo uniformemente acelerado (MRUA) es muy similar al MRU sin embargo este presenta una aceleración constante.

ANÁLISIS

En este problema nos presentan dos objetos con diferentes datos, uno de ellos, el carro, presenta una aceleración de 7 ft/s^2 y el otro, el autobus, presenta una velocidad de 25 ft/s. Necesitamos obtener la velocidad del carro, en el momento en el este alcanza al autobus. Para poder obtener las funciones de velocidad y de posición para cada uno, debemos integrar los valores dados. Una vez que obtengamos las ecuaciones integradas de velocidad y posición debemos igualar las ecuaciones de posición y sustituir el valor obtenido en la función de velocidad integrada del carro.

CÁLCULOS

Carro $a(t)= 7\ ft/s^2$	Autobus $v(t)= 25\ ft/s$
Velocidad	Posición
$\int 7$	$\int 25$
$\int \frac{7t}{1}$	$\int \frac{25t}{1}$
$= 7t$	$= 25t$

Posición
$\int 7t$
$\int \frac{7t^2}{2}$
$= 3.5t^2$

$a(t)= 7 + C\ ft/s^2$
$v(t)= 7t + C\ ft/s$
$x(t) = 3.5t^2 + C$

$v(t)= 25 + C\ ft/s$
$x(t)= 25t + C\ ft/s$

$3.5t^2 = 0$
$25t = 0$

$3.5t^2 - 25t = 0$
$t\ (3.5t - 25) = 0$
$t = 0 \qquad t = 25 / 3.5$
$t = 7.143\ ft/s$

Carro:

$v(t)= 7t + C\ ft/s$
$v\ (7.143) = 7(7.143)\ ft/s$
$v\ (7.143) = 50\ ft/s$

Velocidad del carro en el momento en que alcanza al autobús = 50 ft/s

CONCLUSIÓN

A pesar de que el camión iba con una velocidad mayor, el carro logro pasar al camión cuando este llego a una velocidad de 50 ft/s. Con este proyecto aprendimos que las integrales se pueden aplicar en situaciones de la vida cotidiana para solucionar un problema, además descubrimos la relación tan grande que existe entre la física y las matemáticas, ya que nosotras jamás pensamos que podríamos resolver un problema de física utilizando matemáticas, pensábamos que la única manera de solucionar este tipo de problemas era mediante fórmulas de física.

REFERENCIAS

NA. (NA). Integral calculus. 5 Marzo 2018, de Khan Academy Sitio web: https://es.khanacademy.org/math/integral-calculus

NA. (NA). Movimiento rectilíneo uniforme (m.r.u.),. 5 Marzo 2018, de Fisica Lab Sitio web: https://www.fisicalab.com/apartado/mru

NA. (NA). Movimiento rectilíneo uniforme acelerado (m.r.u.a.),. 5 Marzo 2018, de Fisica Lab Sitio web: https://www.fisicalab.com/apartado/mrua-ecuaciones

FIRST PARTIAL QUIZZES

CALCULUS II

FIRST PARTIAL

QUIZ 1A

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Name: Icaren Bargas ID#: A01570322 Date: 17 / 01 / 18

Answer the following problems with complete procedure.

1. Find the **approximate** value of $(3.04)^3$ (20 pts)

10

$F(x) = \sqrt[3]{x}$ x^3? careful?

$F'(x) = (x)^{1/3}$, $\frac{1}{3}(x)^{-2/3}$, $\frac{1}{3\sqrt[3]{x^2}}$ x

$x_1 = 3$

$x_2 = 3.04$ $dx = x_2 - x_1$ $dx = .04$

$dy = F'(x) \cdot dx$

$dy = \frac{1}{3\sqrt[3]{3^2}} x (.04)$

$dy = .027 + f(3) = ?$

$F(x) = x^3$ $dx = .04$

$F'(x) = 3x^2$

$y = F(x) + F'(x)(dx)$

$y = x^3 + 3x^2(.04)$

$y = 3^3 + 3(3)^2(.04)$

$y = 28.08$

2. Given the equation $f(x) = x^2 - 2x + 3$ find the line tangent to the curve at $x = a = 0$. (20 pts)

$F(0) = 0^2 - 2(0) + 3$

$F(0) = 3$

$F'(x) = 2x - 2$

$F'(0) = 2(0) - 2$

$F'(0) = -2$

$m = -2$

$y_1 = 3$

$x = 0$

$y - 3 = -2(x - 0)$

$y - 3 = -2x$

$y = -2x + 3$

3. The edge of a cube was found to be 20 cm. with a possible error in measurement of 0.1cm. Estimate the maximum possible error in computing the volume of the cube (20 pts)

$V = x^3$

$V = 20^3$

$V = 8000$

$V' = 3x^2$

$V' = 3(20)^2$

$dy = V'(dx)$

$dy = 1200(.1)$

$dy = 120$

$V = 8000 \pm 120\ cm^3$

4. A can is going to be modified in such a way that its height will change from 14cms to 14.8 cm but the diameter of the base will remain as 9cm.

a) Find the change in the volume of the can (20 pts)

No 4 in formula of Volume

$\pi r^2 \cdot h$

$V = \pi r^2 h$

$d = 9cm$

$r = 4.5cm$

$V = \pi r^2 h$

$\Delta V = V_2 - V_1$

$V_2 = 4(\pi)(4.5)^2 \times 14.8$

$V_2 = 3766.14$

$V_1 = 4\pi(4.5)^2 \times 14$

$V_1 = 3562.5$

$\Delta V = 3766.14 - 3562.5$

$\Delta V = 203.5\ cm^3$

2

Procedure ok wrong formula of Volume (It was on the white board)

$y_1 = \pi(4.5)^2(14)$

$y_1 = 890.64$

$y_2 = \pi(4.5)^2(14.8)$

$y_2 = 941.84$

$\Delta y = y_2 - y_1$

$\Delta y = 941.84 - 890.64$

$\Delta y = 50.9\ cm^3$

b) Find the approximate change in the volume of the can (20 pts)

$dy = F'(x) \cdot dx$

$dx = 14.8 - 14$

$dx = .8$

$F'(x) = 8\pi r$

wrong formula & derivative...

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$dy = 8\pi(4.5) \cdot (.8)$

$dy = 90.47\ cm^3$

$dv = \pi r^2 dx$

$dv = \pi(4.5)^2(.8)$

$dv = 50.9\ cm^3$

Prepa Tec
Calculus II

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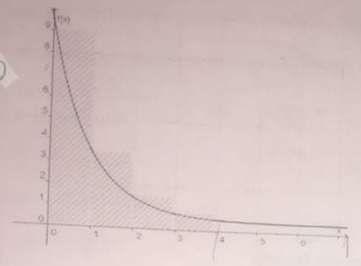
Campus Cumbres
1st partial Quiz # 2A

Name Karen Barajas I.D. A01570822 March, 2017

I. **Multiple choice. Choose the letter of the right answer (10 points).**

1. Choose the sentence that best describes the approximate area below the graph of $f(x)$:



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a) Approximation of the area on the interval $[0,4]$ using 4 partitions with left-hand calculations.
b) Approximation of the area on the interval $[1,5]$ using 4 partitions with right-hand calculations.
c) Approximation of the area on the interval $[0,4]$ using 4 partitions with right-hand calculations.
d) Approximation of the area on the interval $[1,5]$ using 4 partitions with left-hand calculations.

II. Evaluate the integral using the following values. **SHOW THE STEPS OF YOUR PROCEDURE.** (5 points each)

$\int_2^4 x\,dx = 9$ $\int_2^4 x^3 dx = 54$ $\int_2^4 dx = 7$

a. $\int_2^4 (5x^3+4x+6)dx =$ $\int_2^4 5(54)+4(9)+6(7) = 348$

b. $\int_2^4 23\,dx =$ $\int_2^4 23(7) = 161$

c. $\int_3^5 x^3 dx =$ 0

d. $\int_4^2 x\,dx =$ -9

IV. Procedure. Solve the following problem *showing your entire procedure.*

1) Approximate the area of a plane regions using left hand, right hand and middle points approximations.

$f(x)=9-x^2$ on $[3,5]$ 4 rectangles **(20 points)**

$\frac{5-3}{4} = .5$

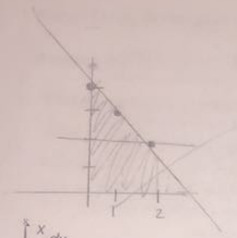
Area (Left hand) = -10.75 u²
Area (Right hand) = -18.75 u²

x	f(x)	Δx	area
3	0	.5	0
3.5	-3.25	.5	-1.625
4	-7	.5	-3.5
4.5	-11.25	.5	-5.625
5	-16	.5	-8

2) Give **the graph (remember to shade the corresponding area)** whose area is given by the following definite integral. Then use a **geometric formula** to **evaluate the integral** (by finding the area) **(15 points each)**

$\int_0^2 (4-x)\,dx$

Graph

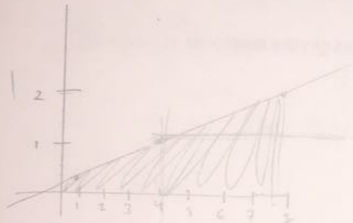


Procedure by geometric formulas

$A = A_1 + A_2$
$A = \left(\frac{b \times a}{2}\right) + (b \times a)$
$A = \frac{2 \times 2}{2} + 2 \times 2$
$A = 2 + 4$
$A = 6u^2$

3) $\int_0^8 \frac{x}{4}\,dx$

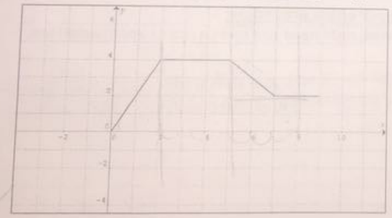
Graph



Procedure by geometric formulas

$A = A_1 + A_2 + A_3$
$A = \frac{b \times a}{2} + \frac{b \times a}{2} + b \times a$
$A = \frac{4 \times 1}{2} + \frac{4 \times 1}{2} + 4 \times 1$
$A = 2 + 2 + 4$
$A = 8u^2$

3) **Based on the following graph evaluate the given definite integrals (5 points each):**



1. $\int_0^3 f(x)dx$ 8

$A = \frac{b \times a}{2} + b \times a$
$A = \frac{(2 \times 4)}{2} + (3 \times 1)$

2. $\int_4^7 f(x)dx$ -8 -8

$A = b \times a$
$A = 2 \times 4$

3. $\int_5^7 f(x)dx$ 6

$A = \frac{b \times a}{2} + b \times a$
$A = \frac{2 \times 2}{2} + 2 \times 2$

4. $\int_0^7 f(x)dx$ 24

$A = \frac{b \times a}{2} + b \times a + \frac{b \times a}{2} + b \times a$
$A = \frac{2 \times 4}{2} + 3 \times 4 + \frac{2 \times 2}{2} + 3 \times 2$
$A = 4 + 12 + 2 + 6$

SECOND PARTIAL QUIZZES

Prepa Tec
Campus Cumbres

Calculus II
2nd partial Quiz #1A

Name Lorena Barajas I.D. A01570322 Date: 22/02/2018

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

1. (T) 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. (T) $\int x(x^2+3)^2dx=\frac{1}{6}(x^2+3)^3+C$
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 $-6\sin 3x+3+C$

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 $a(t)=\frac{3}{t-4}$ 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'.

$\frac{3}{1}\int\ln(t-4)+C$ $v(t)=3\ln(t-4)+8$

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

$\int 3\ln(t-4)$ $u=t-4$ $du=1$

$3\int\ln(t-4)$

$v(t)=3\ln(t-4)+8$

$\int 3\ln(t-4)+C$

$\ln(t-4)+C$

$\ln(5-4)=8$

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

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

$\frac{96}{2}\int\frac{\sin(2x+\pi)^3}{3}$ $\frac{48\sin(2x+\pi)}{3}$

$48\int\frac{\sin(2x+\pi)}{3}$

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

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

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

$u=\sin 2x+\pi$

$du=2\cos 2x+\pi dx$

$h(x)=96\sin^2(2x+\pi)\cos($

$\frac{96}{2}\int u^2$

$\frac{48}{1}\int\frac{u^3}{3}$

2- $v(t)=\frac{e^{5/t}}{3t^2}$ $-\frac{e^{5/t}}{15}+C$

$\frac{1}{3}\cdot\frac{1}{5}\int e^{5/t}$

$x(t)=\frac{e^{5/t}}{3\cdot(5)}=\frac{e^{5/t}}{-15}+C$

$x(t)=\frac{e^{5/t}}{-15}+C$

$u=e^{5/t}$ $du=-5/t^2\,5t^{-2}$

$u=5/t$ $du=\frac{-5}{t^2}$

$\frac{1}{3}\cdot\frac{1}{5}\int e^{5/t}$

3- $\int 3xCot(6x^2-1)Sin(6x^2-1)dx$

$\frac{3}{12}\int\ln(\sin(6x^2-1))$

$\frac{1}{4}\ln|\sin(6x^2-1)|+C$

$\int 3x\cot(6x^2-1)\sin(6x^2-1)$ $6x^2-1$ $du=12x$

$\int 3x\frac{\cos}{\sin}\cdot\frac{\sin}{1}$

$3x\cos(6x^2-1)$ $u=6x^2-1$ $du=12x$

$\frac{3}{12}\int\cos$

$\frac{3\sin(6x^2-1)}{12}+C$

4- $\int 7\sec(3x)\tan(3x)dx$ No more

$\frac{7}{3}\sec(3x)+C$

$\sec(u)\tan(u)=\sec(u)$

$u=3x$ $du=3$

$u=3x$

$du=3$

$\frac{7}{3}\sec(3x)+C$

$\sec(u)\tan(u)=\sec(u)$

Prepa Tec
Calculus II

Campus Cumbres
2nd partial Quiz # 2A

Name Karen Barajas I.D. A01570322 March, 2018

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

1. $\int Sin^3(2x)dx$

$\int (\sin(2x))(\sin^2(2x))\,dx$

$\int (\sin(2x))(1+\cos^2(2x))$ FOIL...

$\int (1)^2 + 2(1)(\cos(2x)) + (\cos(2x))^2$

$\int dx + 2\int \cos(2x) + \int \cos^2(2x)$

$x + 2\cos(2x) + \cos^2(2x)$

$\frac{x^2}{2\cdot 2} + \frac{2\cos^3(2x)}{2\cdot 2} + \frac{\cos^3(2x)}{3\cdot 2} + C$?

not variables

$\frac{x^2}{4} + \frac{\cos^2(2x)}{2} + \frac{\cos^3(2x)}{6} + C$

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

$\sin 2x - \sin 2x\cos^2 2x$

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

2. $\int x^6\cos^2(x^7)dx$

$\int \cos^2(x^7)$

$\frac{1}{6}\int \frac{1+\cos 2(x^7)}{2}$

$\frac{1}{6}\int \frac{1+\cos 2x^7}{2}$

$\frac{1}{6}\cdot\frac{1}{2}\int \cos 2x^7$

$\frac{1}{12}\sin(2x^7) + C$

$\frac{x^7}{14} + \frac{\sin 2x^7}{28} + C$

$\frac{1}{2}(1+\cos 2x^7)$

$1/2(x^6 + x^6\cos 2x^7)$

$1/2(\frac{x^7}{7} + 1/14\sin 2x^7)$

3. $\int 9x^4\tan^3(x^5)dx$

$\int 9x^4\tan^3(x^5)$

$\int \frac{9x^4}{5x^4}\tan^2(x^5)\tan(x^5)$

$\int \frac{9x^4}{5x^4}\tan(x^5)(\sec^2(x^5) - 9x^4\tan x^5$

$\int \frac{9}{5}\tan(x^5)(\tan^2(x^5) - \frac{9x^5}{5}$

$\frac{9}{5}\tan(x^5) - \frac{9x^5}{5} + C$

$(\sec^2 x^5 - 1)9x^4\tan x^5$

$\int 9x^4\tan x^5\sec^2 x^5 - \int 9x^4\tan$

$\frac{9\tan^2}{5(2)} + \frac{9\ln|\cos x^5|}{5}$

$\frac{9\tan^2 x^5}{10} + \frac{9\ln|\cos x^5|}{5} +$

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

$\int x^3\sin^2(x^4)$

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

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

$\frac{1}{4}\int \frac{1}{2}\cos(2x^4)$

$\frac{1}{4}\cdot\frac{1}{2}\int \cos(2x^4)$

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

$\frac{x^4}{8} - \frac{\sin 2x^4}{16} + C$

$1/2(1-\cos 2x^4)$

$1/2(x^3 - x^3\cos 2x^4)$

$1/2(\frac{x^4}{4} - \frac{1}{8}\sin 2x^4)$

5. $\int Cot^2(5x)dx =$

$\int \csc^2 5x$

$\int \frac{1}{5}\csc^2 - 5x$

$\int \frac{1}{5}\csc^2 - \frac{5x^2}{2}$

$\frac{1}{5}\csc^2 - \frac{5x^2}{2}$

$\frac{1}{5}\cos - \frac{5x^2}{2} + C$

$\cot^2 = \csc^2 - 1$

$(\csc^2 5x - 1)$

$-\frac{\cot 5x}{5} - x + C$

BONUS (8 POINTS)

$\int Cos^5(3x)dx$

$\int (\cos^2(3x))^2(\cos 3x)$

$\int (1-\sin^2(3x))^2(\cos(3x))$

$((1)^2 - 2(1)(-\sin^2(3x)) + \sin^4(3x))$

$dx - 2(\sin^2(3x)) + \sin^4(3x)$

$x - 2\sin^2(3x) + \sin^4(3x)$

$\frac{x^2}{2} - \frac{2\sin^3(3x)}{3\cdot 3} + \frac{\sin^5(3x)}{5\cdot 3}$

$\frac{x}{6} - \frac{2\sin^3(3x)}{9} + \frac{\sin^5(3x)}{15} + C$

THIRD PARTIAL QUIZZES

Prepa Tec Campus Cumbres
Calculus II

3rd partial Quiz # 1B

Name Karen Barajas I.D. A01570322 April, 2018

100

Choose T (true) or F (false) for each statement.

1. The integral of $\int (8x+4)(x^2+x)^3\,dx$ is $\frac{1}{4}(x^2+x)^4+C$ F T

2. The integral of $\int 4x\sqrt{2x-3}\,dx$ is $(2x-3)^{\frac{5}{2}}+(2x-3)^{\frac{3}{2}}+C$ F T

3. The partial fraction decomposition of the integral $\int \frac{x^2+4}{3x^3+4x^2-4x}dx$ is $\frac{A}{x}+\frac{B}{(3x-2)}+\frac{C}{(x+2)}$ F T

4. The integral of $\int \frac{x^2+26x+12}{5x^3+3x^2}dx$ is $-\frac{9}{5}\ln|5x+3|+2\ln|x|-\frac{4}{x}+C$ F T

5. Solve the following integral, **SHOW THE STEPS OF YOUR PROCEDURE.**

$$\int \frac{3x^3-23x^2-2x+112}{x^2-5x-14}dx$$

$$\int \frac{2x^3-4x^2-15x+5}{x^2-2x-8}dx = \int 2x + \frac{x+5}{x^2-2x-8}$$

$$\begin{array}{r|l} & 2x \\ x^2-2x-8 & 2x^3-4x^2-15x+5 \\ & -2x^3-4x^2-16x \\ \hline & x+5 \end{array}$$

$u = x^2-2x-8$
$du = (x-4)(x+2)$

$$\int \frac{x+5}{x^2-2x-8} = \frac{A}{(x-4)} + \frac{B}{(x+2)}$$

$x+5 = A(x+2)+B(x-4)$
$x+5 = Ax+2A+Bx-4B$
$x = Ax+Bx$
$x = x(A+B)$
$x/x = A+B$
$1 = A+B$
$1-A = B$
$1-3/2 = B$
$B = -1/2$

$5 = 2A-4B$
$5 = 2A-4(1-A)$
$5 = 2A-4+4A$
$5+4 = 6A$
$A = 9/6$
$A = 3/2$

$$\int \frac{x+5}{x^2-2x-8} = \frac{A}{x-4} + \frac{B}{x+2}$$

$$\int \frac{x+5}{x^2-2x-8} = \frac{3/2}{x-4} - \frac{1/2}{x+2}$$

$$= 3/2\ln|x-4| - 1/2\ln|x+2|$$

$$\int 2x = \frac{2x^2}{2} = x^2 + 3/2\ln|x-4| - 1/2\ln|x+2| + C$$

87.5

CALCULUS II
QUIZ 2 B 3RD PARTIAL

Name Karen Barayas ID A01570822 DATE: 26/04/2018

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. (12.5 pts each one)

Evaluate the integral.

1) $\int 4xe^x\,dx$ 1) A

A) $4xe^x - 4e^x + C$ B) $xe^x - 4e^x + C$ C) $4e^x - e^x + C$ D) $4e^x - 4xe^x + C$

2) $\int e^{5x}\cos 4x\,dx$ 2) ~~D~~ C

A) $\frac{e^{5x}}{2}[\sin 4x + \cos 4x] + C$ B) $\frac{1}{41}[4e^{5x}\sin 4x + 5\cos 4x] + C$

C) $\frac{e^{5x}}{41}[4\sin 4x + 5\cos 4x] + C$ D) $\frac{e^{5x}}{41}[4\sin 4x - 5\cos 4x] + C$

-12.5

3) $\int (2x-1)\ln(24x)\,dx$ 3) A

A) $\left(x^2 - x\right)\ln 24x - \frac{x^2}{2} + x + C$ B) $\left(x^2 - x\right)\ln 24x - \frac{x^2}{2} + 2x + C$

C) $\left(\frac{x^2}{2} - x\right)\ln 24x - \frac{x^2}{4} + x + C$ D) $\left(x^2 - x\right)\ln 24x - x^2 + x + C$

4) $\int 23x\cos\frac{1}{2}x\,dx$ 4) B

A) $23x\sin\left(\frac{1}{2}\right)x - 46\cos\left(\frac{1}{2}\right)x + C$ B) $46x\sin\left(\frac{1}{2}\right)x + 92\cos\left(\frac{1}{2}\right)x + C$

C) $92\sin\left(\frac{1}{2}\right)x - 46x\cos\left(\frac{1}{2}\right)x + C$ D) $23\sin\left(\frac{1}{2}\right)x + 46x\cos\left(\frac{1}{2}\right)x + C$

5) $\int e^{2x}x^2\,dx$ 5) B

A) $(1/2)x^2e^{2x} - (1/4)xe^{2x} + (1/4)e^{2x} + C$ B) $(1/2)x^2e^{2x} - (1/2)xe^{2x} + (1/4)e^{2x} + C$

C) $(1/2)x^2e^{2x} - (1/2)xe^{2x} + C$ D) $(1/2)x^2e^{2x} - xe^{2x} + (1/4)e^{2x} + C$

6) $\int x^3\cos 3x\,dx$ 6) C

A) $\frac{1}{3}x^3\sin 3x - \frac{1}{3}x^2\cos 3x + \frac{2}{9}x\sin 3x + \frac{2}{27}\cos 3x + C$

B) $\frac{1}{3}x^3\sin 3x + 1x^2\cos 3x - 2x\sin 3x - 2\cos 3x + C$

C) $\frac{1}{3}x^3\sin 3x + \frac{1}{3}x^2\cos 3x - \frac{2}{9}x\sin 3x - \frac{2}{27}\cos 3x + C$

D) $\frac{1}{3}x^3\cos 3x + \frac{1}{3}x^2\sin 3x - \frac{2}{9}x\cos 3x - \frac{2}{27}\sin 3x + C$

7) $\int_0^4 x^4\ln 9x\,dx$ 7) D

A) 774.86 B) -201.22 C) 699.77 D) 692.94

8) $\int (x^2 - 3x)e^x\,dx$ 8) A

A) $e^x[x^2 - 5x + 5] + C$ B) $e^x[x^2 - 5x - 5] + C$

C) $e^x[x^2 - 3x + 3] + C$ D) $\frac{1}{3}x^3e^x - \frac{3}{2}x^2e^x + C$

② $\int e^{5x}\cos 4x\,dx = \cos 4x\left(\frac{e^{5x}}{5}\right) - \int \frac{1}{5}e^{5x}(-4\sin 4x)\,dx$

$u = \sin 4x \quad dv = \int e^{5x}$

$du = 4\cos 4x \quad v = \frac{1}{5}e^{5x}$

$\int e^{5x}\cos 4x\,dx = \frac{e^{5x}\cos 4x}{5} + \frac{4}{5}\int e^{5x}\sin 4x\,dx$

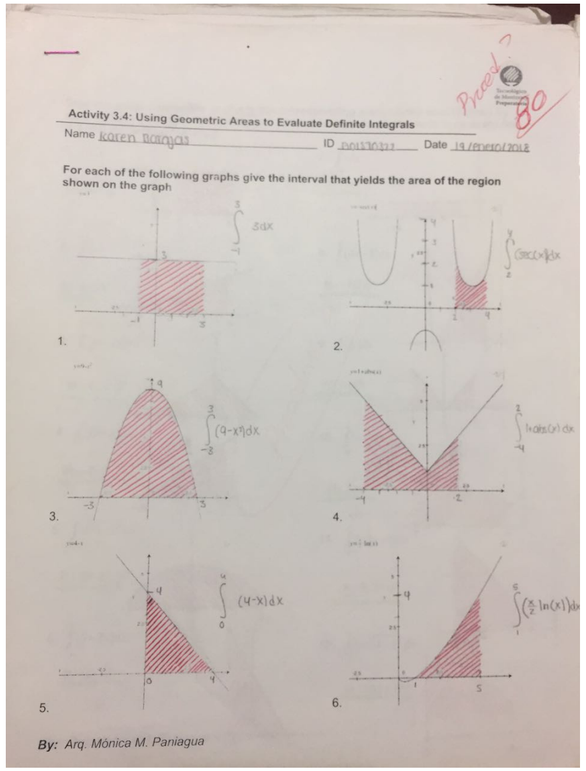
$= \frac{e^{5x}\cos 4x}{5} + \frac{4}{5}\left[\frac{e^{5x}\sin 4x}{5} - \int \frac{1}{5}e^{5x}4\cos 4x\,dx\right]$

$\int e^{5x}\cos 4x\,dx = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25} - \frac{4}{5}\left(\frac{4}{5}\right)\int e^{5x}\cos 4x$

$A + \frac{16}{25}A = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}\sin 4x}{25} \qquad \frac{41}{25}A = \frac{e^{5x}\cos 4x}{5} + \frac{4e^{5x}}{25}$

$\int e^{5x}\cos 4x\,dx = \frac{25}{41}\left(\frac{e^{5x}\cos 4x}{5}\right) + \frac{25}{41}\left(\frac{4}{25}e^{5x}\sin 4x\right)$

$\int e^{5x}\cos 4x\,dx = \frac{e^{5x}}{41}(5\cos 4x + 4\sin 4x) + C$



Activity 3.4: Using Geometric Areas to Evaluate Definite Integrals

Name Karen Barrera ID [illegible] Date 19/enero/2018

For each of the following graphs give the interval that yields the area of the region shown on the graph

1. $\int_{-1}^{3} 3\,dx$

2. $\int_{-2}^{4} (3\sec(x))\,dx$

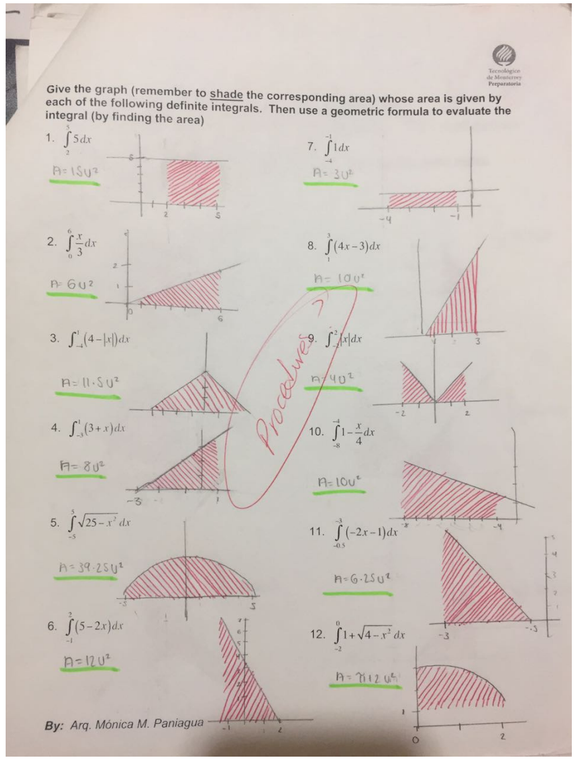
3. $\int_{-5}^{3} (9-x^2)\,dx$

4. $\int_{-4}^{3} |\ln(x)|\,dx$

5. $\int_{0}^{4} (4-x)\,dx$

6. $\int_{1}^{5} \left(\frac{5}{2}\ln(x)\right)dx$

By: Arq. Mónica M. Paniagua



Give the graph (remember to shade the corresponding area) whose area is given by each of the following definite integrals. Then use a geometric formula to evaluate the integral (by finding the area)

1. $\int_{2}^{5} 5\,dx$ A= 15u²

2. $\int_{0}^{6} \frac{x}{3}\,dx$ A= 6u²

3. $\int_{-4}^{1} (4-|x|)\,dx$ A= 11.5u²

4. $\int_{-3}^{1} (3+x)\,dx$ A= 8u²

5. $\int_{-3}^{3} \sqrt{25-x^2}\,dx$ A= 39.25u²

6. $\int_{-1}^{2} (5-2x)\,dx$ A= 12u²

7. $\int_{-4}^{-1} 1\,dx$ A= 3u²

8. $\int_{1}^{3} (4x-3)\,dx$ A= 10u²

9. $\int_{-2}^{2} |x|\,dx$ A= 4u²

10. $\int_{-8}^{4} 1-\frac{x}{4}\,dx$ A= 10u²

11. $\int_{-0.5}^{3} (-2x-1)\,dx$ A= 6.25u²

12. $\int_{-2}^{0} 1+\sqrt{4-x^2}\,dx$ A= 7.12u²

Procedures

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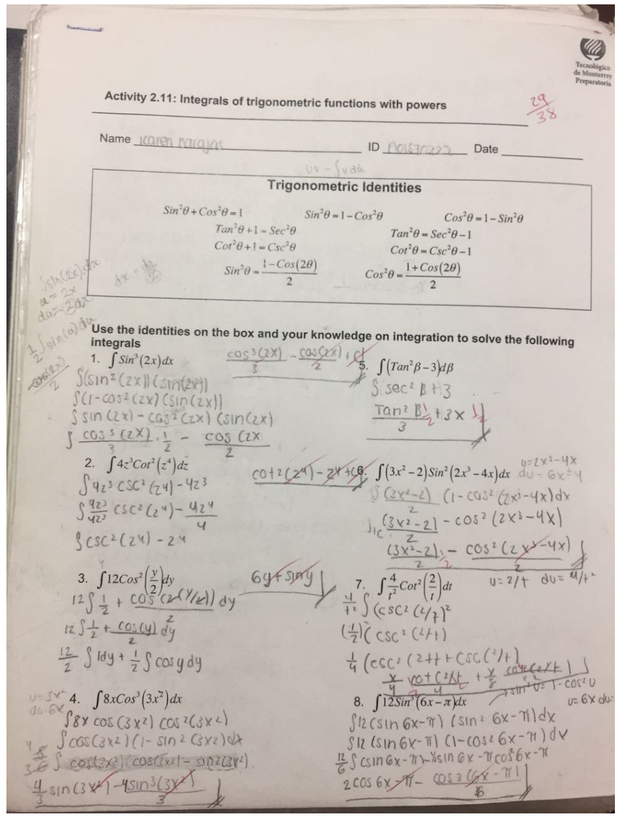
SIGNIFICANT ACTIVITY 1

For me this activity was significant because it was the first topic that I understood and I was able to do the activity without any problem, but I also chose this because I also learned that no matter how easy the problems are I must always write the procedure otherwise points will be taken away from me.



Activity 2.11: Integrals of trigonometric functions with powers

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Trigonometric Identities

$Sin^2\theta + Cos^2\theta = 1$ $\quad Sin^2\theta = 1 - Cos^2\theta$ $\quad Cos^2\theta = 1 - Sin^2\theta$

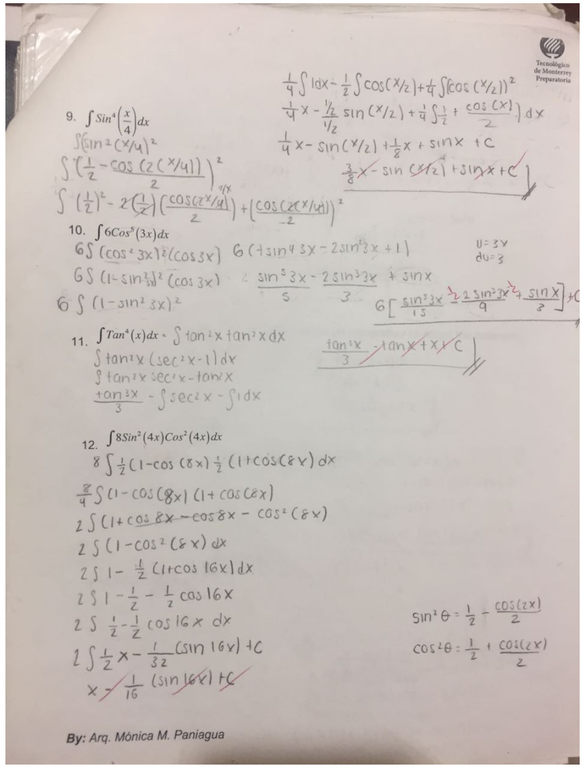
$Tan^2\theta + 1 = Sec^2\theta$ $\quad Tan^2\theta = Sec^2\theta - 1$

$Cot^2\theta + 1 = Csc^2\theta$ $\quad Cot^2\theta = Csc^2\theta - 1$

$Sin^2\theta = \frac{1 - Cos(2\theta)}{2}$ $\quad Cos^2\theta = \frac{1 + Cos(2\theta)}{2}$

Use the identities on the box and your knowledge on integration to solve the following integrals

1. $\int Sin^2(2x)dx$
2. $\int 4z^3 Cot^2(z^4)dz$
3. $\int 12Cos^2\left(\frac{y}{2}\right)dy$
4. $\int 8xCos^3(3x^2)dx$
5. $\int (Tan^2\beta - 3)d\beta$
6. $\int (3x^2 - 2)Sin^2(2x^3 - 4x)dx$
7. $\int \frac{4}{i^2} Cot^2\left(\frac{2}{i}\right)dt$
8. $\int 12Sin^2(6x - \pi)dx$



9. $\int Sin^4\left(\frac{x}{4}\right)dx$
10. $\int 6Cos^5(3x)dx$
11. $\int Tan^4(x)dx$
12. $\int 8Sin^2(4x)Cos^2(4x)dx$

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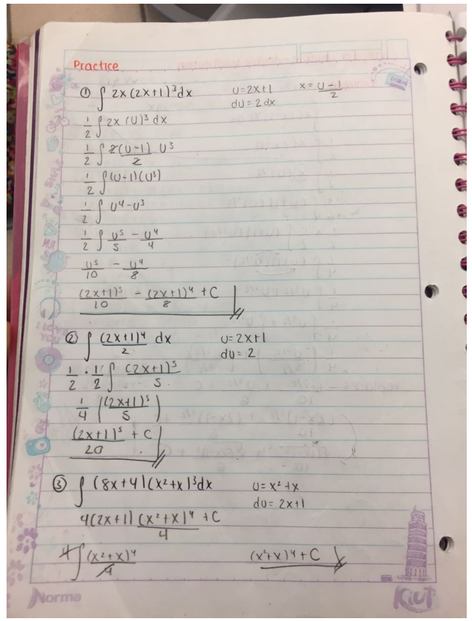
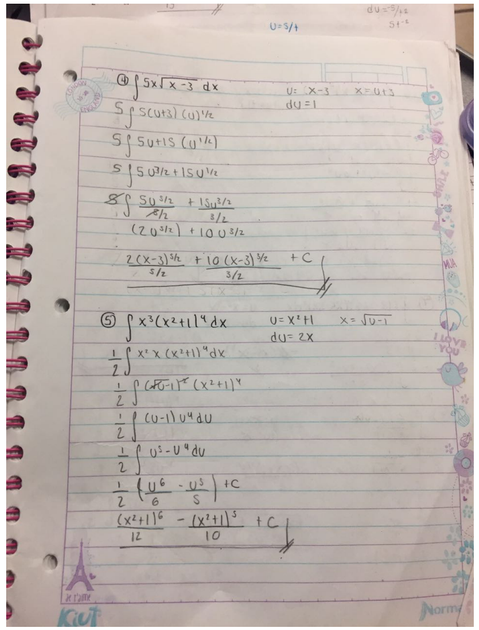
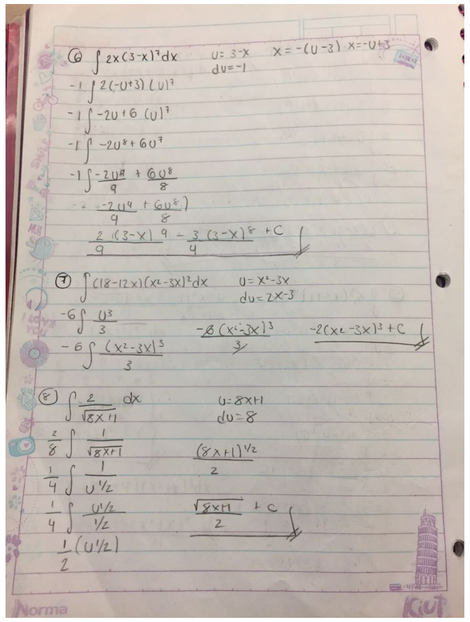
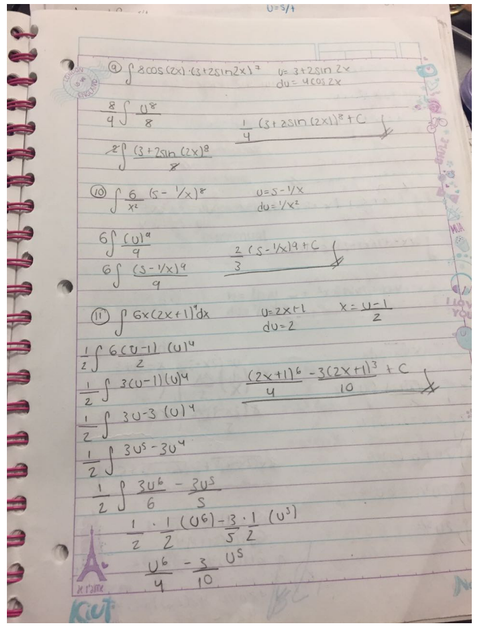
SIGNIFICANT ACTIVITY 2

For me this activity was significant because this partial was the one where I struggled the most mainly in this topic and this activity helped me a lot the day before the exam because thanks to this active I was able to understand the topic.









SIGNIFICANT ACTIVITY 3

For me this activity was possibly the most meaningful of all, because this activity was the one I used to study for my third partial quiz and thanks to this I was able to obtain my first 100 in a quiz during the entire semester.

CONCLUSION

For me this was the semester where I struggled the most in Math, I definitely noticed my grades dropped because in Calculus 1 my grades were almost perfect and now they are not. This was because of me, actually all the activities, quizzes helped me a lot to improve my grades this semester I like to have a lot of activities because those are the ones that help me when I am studying. I really like this class because I want to study Chemical Engineering and calculus is one of the most important topics in my career so everything that I've learned in here will definitely help me in the future, because i already have the basic knowledge of Calculus.