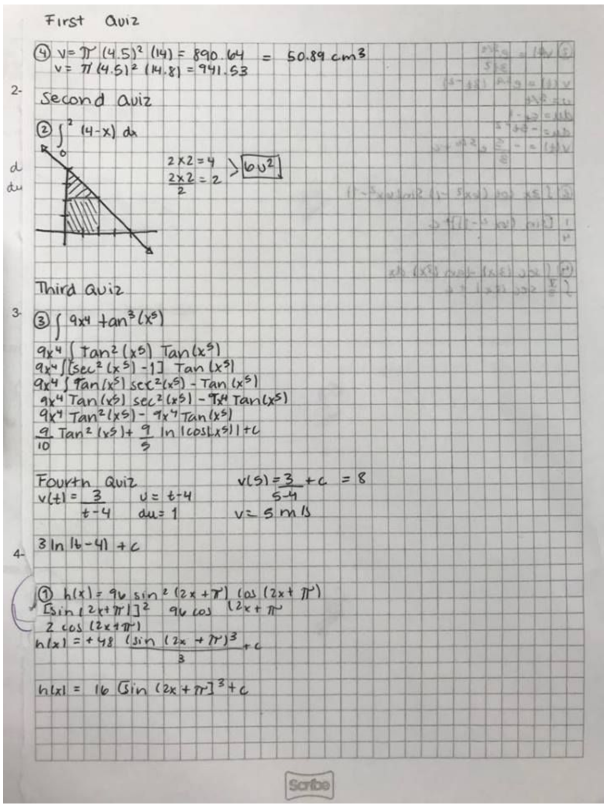
Faisal Hussein Fernández del Bosque A01570170

Math portafolio



First Quiz

④ $v = \pi (4.5)^2 (14) = 890.64 = 50.89\ cm^3$
$v = \pi (4.5)^2 (14.8) = 941.53$

2- Second Quiz

② $\int_0^2 (4-x)\, dx$

$2 \times 2 = 4$
$\frac{2 \times 2}{2} = 2$ $\boxed{6u^2}$

Third Quiz

3- ③ $\int 9x^4 \tan^3(x^5)$

$9x^4 \int \tan^2(x^5) \tan(x^5)$
$9x^4 \int [\sec^2(x^5) - 1] \tan(x^5)$
$9x^4 \int \tan(x^5) \sec^2(x^5) - \tan(x^5)$
$9x^4 \tan(x^5) \sec^2(x^5) - 9x^4 \tan(x^5)$
$9x^4 \tan^2(x^5) - 9x^4 \tan(x^5)$
$\frac{9}{10} \tan^2(x^5) + \frac{9}{5} \ln|\cos(x^5)| + c$

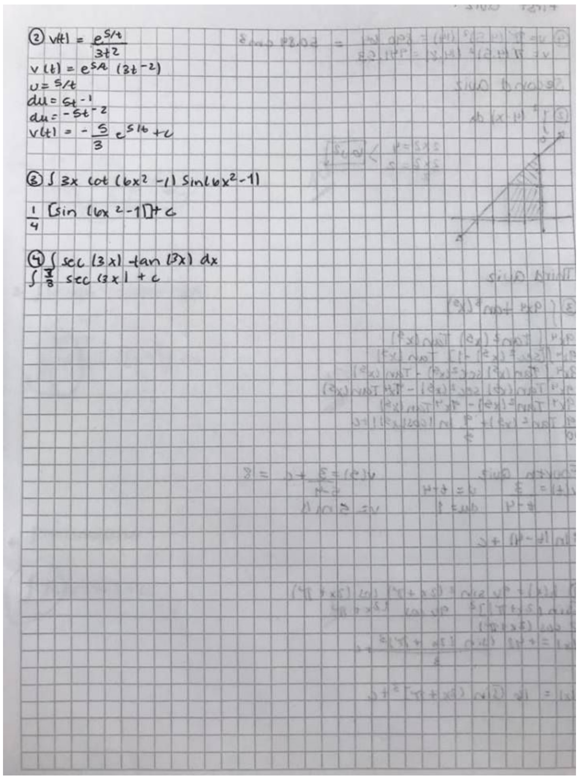
Fourth Quiz

$v(t) = \frac{3}{t-4}$ $u = t-4$ $du = 1$
$v(5) = \frac{3}{5-4} + c = 8$
$v = 5\ m/s$

4- $3 \ln|t-4| + c$

① $h(x) = 96 \sin^2(2x+\pi) \cos(2x+\pi)$
$[\sin(2x+\pi)]^2 \quad 96 \cos(2x+\pi)$
$2 \cos(2x+\pi)$
$h(x) = +48 \frac{(\sin(2x+\pi))^3}{3} + c$

$h(x) = 16 [\sin(2x+\pi)]^3 + c$

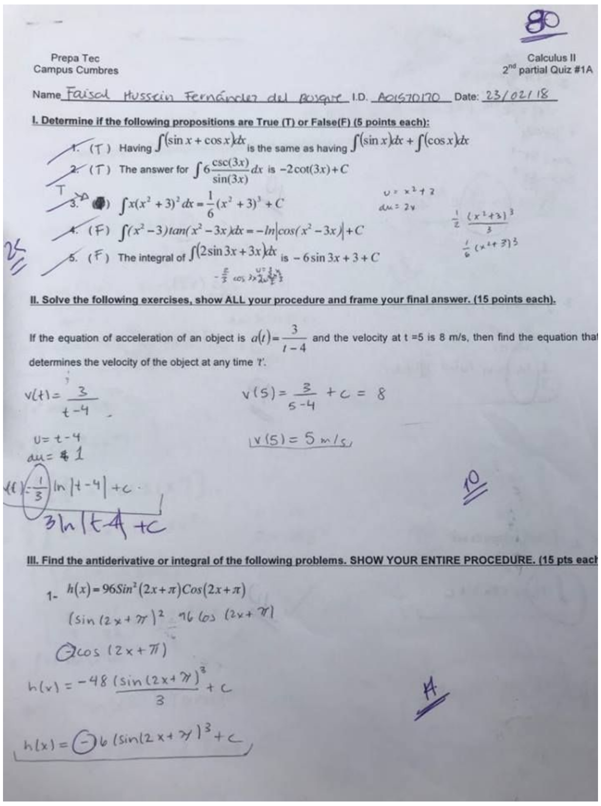


② $v(t) = \frac{e^{5/t}}{3t^2}$
$v(t) = e^{5/t} (3t^{-2})$
$u = 5/t$
$du = 5t^{-1}$
$du = -5t^{-2}$
$v(t) = -\frac{5}{3} e^{5/t} + c$

③ $\int 3x \cot(6x^2-1) \sin(6x^2-1)$

$\frac{1}{4} [\sin(6x^2-1)] + c$

④ $\int \sec(3x) \tan(3x)\, dx$
$\int \frac{1}{3} \sec(3x) + c$



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Prepa Tec
Campus Cumbres

Calculus II
2^{nd} partial Quiz #1A

Name Faisal Hussein Fernández del Bosque I.D. A01570170 Date: 23/02/18

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. (T) The answer for $\int 6\frac{\csc(3x)}{\sin(3x)}dx$ is $-2\cot(3x)+C$
3. T ( ) $\int x(x^2+3)^2 dx = \frac{1}{6}(x^2+3)^3 + C$ $u = x^2+3$ $du = 2x$ $\frac{1}{2}\frac{(x^2+3)^3}{3}$ $\frac{1}{6}(x^2+3)^3$
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 $-6\sin 3x + 3 + C$

25

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'.

$v(t) = \frac{3}{t-4}$
$v(5) = \frac{3}{5-4} + c = 8$

$u = t-4$
$du = 1$
$v(5) = 5\ m/s$

$v(t) = \frac{1}{3} \ln|t-4| + c$

$3 \ln|t-4| + c$

10

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

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

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

$-2\cos(2x+\pi)$

$h(x) = -48 \frac{(\sin(2x+\pi))^3}{3} + c$

$h(x) = -16 (\sin(2x+\pi))^3 + c$

14

88

Prepa Tec
Calculus II

Campus Cumbres
2st partial Quiz # 2A

Name Faisal Fernández I.D. A01570170 March, 2018

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

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

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

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

$\sin(2x) - \cancel{\sin(2x)}\cos^2(2x)$

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

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

18

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

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

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

$\frac{1}{2}\int x^6 + x^6\cos 2x^7$ $u=2x^7$ $du=14x^6$

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

$\boxed{\frac{x^7}{14} + \frac{1}{28}\sin(2x^7) + C}$

20

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

$9x^4\int Tan^2(x^5)\,Tan(x^5)$

$9x^4\int [Sec^2(x^5)-1]\,Tan(x^5)$

$9x^4\int Tan(x^5)Sec^2(x^5) - Tan(x^5)$

$9x^4 Tan(x^5)\,sec^2(x^5) - 9x^4 Tan(x^5)$

$u=sec(x^5)$ $du=Tan$ $u=5x^4$

$-\frac{9}{5}\ln|\cos(x^5)|$

$\frac{9}{5}Tan(x^5)\frac{Sec^3(x^5)}{3} - \frac{9}{5}\ln|\cos$

10

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95 +2

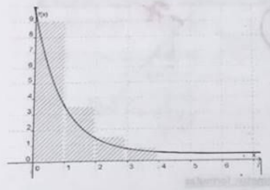
Prepa Tec
Calculus II

Campus Cumbres
1st partial Quiz # 2A

Name Faisal Fernández del Bosque I.D. A01570170 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 $f(x)$:



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)

$\int_2^4 x\,dx = 9$ $\int_2^4 x^3dx = 54$ $\int_2^4 dx = 7$ 320

$\frac{5x^4}{4} + 2x^2 + 6x$ 270 + 36 + 42

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

b. $\int_2^4 23dx =$ 161 $\frac{5x^4}{4}$

424

c. $\int_5^5 x^3dx =$ 0

d. $\int_4^2 x\,dx =$ -9 $-\int_2^4 x\,dx = 9(-1) = -9$

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)**

Area (Left hand) = $-10.76u^2$
Area (Right hand) = $-18.76u^2$

$9-3^2$ $\Delta x = \frac{5-3}{4}$ $\frac{5-3}{4}$

$9-9=0$ $\Delta x = 0.5$

LEFT 0.5(0)

.5(3) = 0
.5(3.5) = -1.63
.5(4) = -3.5
.5(4.5) = -5.63
-10.76

$\Delta x = 0.5$

RIGHT
0.5(3.5) = -1.63
0.5(4) = -3.5
0.5(4.5) = -5.63
0.5(5) = -8
-18.76

$9-x^2$

+2

---

85 +2

87

CALCULUS II
FIRST PARTIAL
QUIZ 1A

Name: Faisal Fernández del Bosque **ID#:** A01570170 **Date:** 17 / 01 / 18

Answer the following problems with complete procedure.

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

x^3 $x = 3$
$3x^2$ $dx = 0.04$

$x^3 + 3x^2(.04)$
$27 + 27(.04) =$
$27 + 1.08 = 28.08$

$3^3 + 3(3)^2(0.04)$
$27 + 1.08$
$\boxed{28.08}$

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

$f'(a)(x-x_1)+f(a)$ $2x-2$ -2 $\frac{x^3}{3} - x^2 + 3x$

$-2(x-0)+3$ $(2x-2)$ $2(0)-2$

$\boxed{f(x) = -2x+3}$ $-2(x-0)+3$ $2x-2$

$0 - 2x$

$\boxed{-2x+3}$

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)

x^3
$20^3 = 8000$
$3(20)^2(0.1) = 120$

$\boxed{8000 \pm 120\ cm^3}$

20 x^3 8000 ± 120

$20^3 = 8000$

$3(20)^2(0.1) = 120$

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100 excellent!! +4

CALCULUS II
QUIZ 2 B 3RD PARTIAL

Name Faisal Fernández del Bosque ID A01570170 DATE: 24/04/18
Sofia P.Pierez
A01570163

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) $\int e^{5x}\cos 4x\,dx$ - No solution 2) NS

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

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

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

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

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

① $4xe^x$ $4xe^x - 4e^x + C$

④ $23x\cos\frac{1}{2}dx$ $23x(2\sin(\frac{1}{2})) + 23(4\cos(\frac{1}{2}))$

③ $2x\ln(24x) - \ln(24x)$

$u = \ln(24x)$ $dv = 2x-1$

$du = \frac{24}{24x} = \frac{1}{x}$ $v = x^2 - x$

$-\frac{x^2}{2}$

⑤ $x^2(\frac{1}{2}e^{2x}) - 2(\frac{1}{4}e^{2x}) + 2(\frac{1}{8}e^{2x})$

Faisal Fernández del Bosque A01570170

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

En este proyecto calcularemos la velocidad con la que un carro alcanza a un camión del Tec, analizaremos el problema y sacaremos el resultado con los datos que nos fueron proporcionados. Tendere que obtener el tiempo para poder sacar la velocidad y saber cuando es que se intersectaron ambos automobiles.

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 $4 ft/s^2$. Un autobús Expreso Tec viaja en la misma dirección con una velocidad constante de 25 ft/s, sobrepasando al auto.

a) Determina la velocidad del auto cuando alcanza al autobús

A(t)= 4
V(t)= 4t
P(t)= 4t^2/2

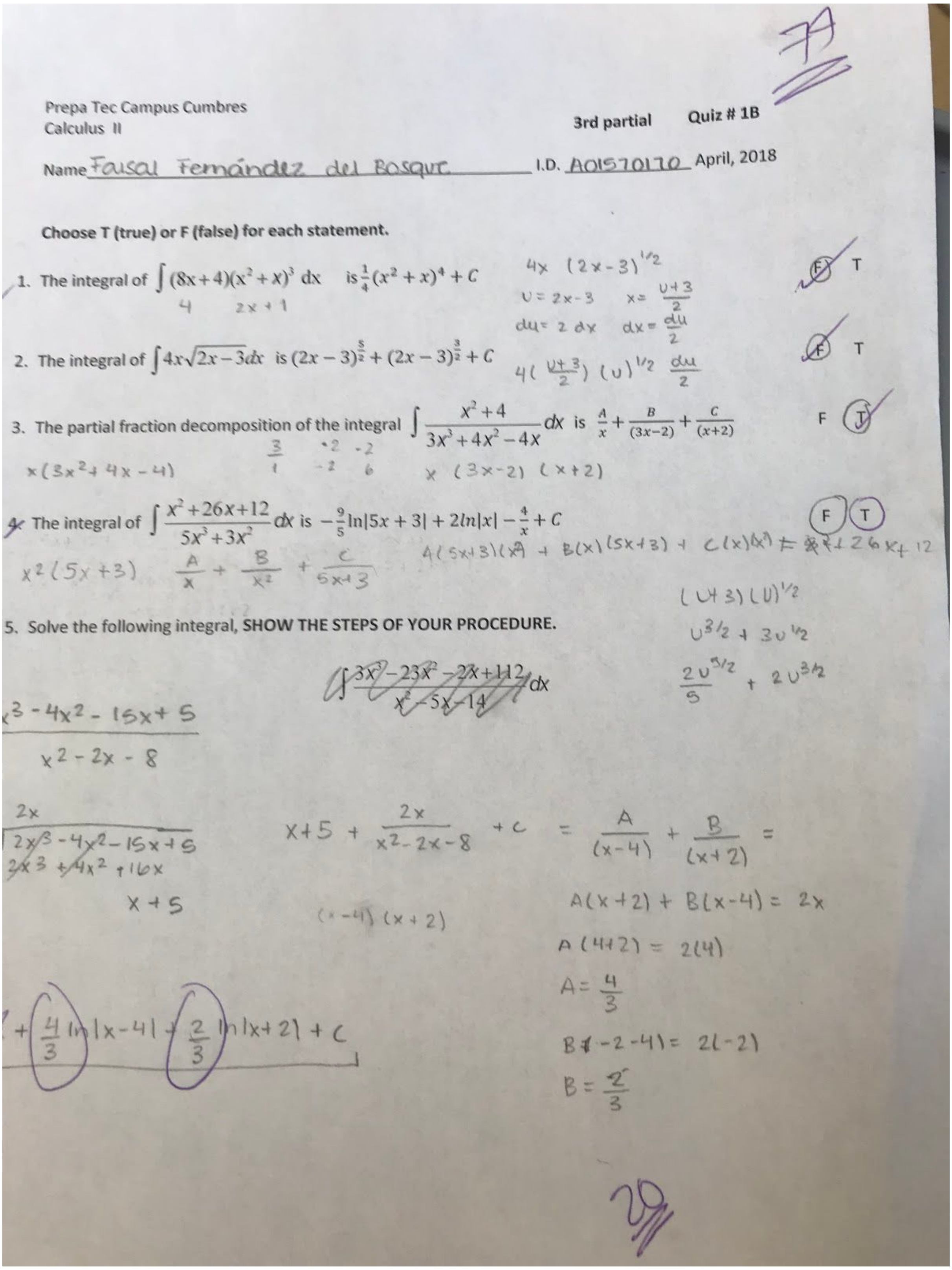
V(t)= 25
P(t)= 25t

4t^2/2=28t
t= 28/4/2
t= 14 s

V(t)= 4(14)
V(t)= 56 ft/s

En conclusión cuando pasen 14 segundos ambos carros estaran a la misma distancia y el carro tuvo que tener una velocidad de 56 ft/s para alcanzar al camión.

100



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Prepa Tec Campus Cumbres
Calculus II

3rd partial Quiz # 1B

Name Faisal Fernández del Bosque I.D. A01570170 April, 2018

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

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

$u=2x-3 \quad x=\frac{u+3}{2}$

$du=2\,dx \quad dx=\frac{du}{2}$

$4\left(\frac{u+3}{2}\right)(u)^{1/2}\ \frac{du}{2}$

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

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

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

$x^2(5x+3) \quad \frac{A}{x}+\frac{B}{x^2}+\frac{C}{5x+3}$

$A(5x+3)(x)+B(x)(5x+3)+C(x)(x)=x^2+26x+12$

$(u+3)(u)^{1/2}$

$u^{3/2}+3u^{1/2}$

$\frac{2u^{5/2}}{5}+2u^{3/2}$

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

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

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

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

$(x-4)(x+2)$

$A(x+2)+B(x-4)=2x$

$A(4+2)=2(4)$

$A=\frac{4}{3}$

$B(-2-4)=2(-2)$

$B=\frac{2}{3}$

$+\frac{4}{3}\ln|x-4|+\frac{2}{3}\ln|x+2|+C$

20

A significant activity of the first partial for me is the project, because I could relate sports that is something that I like to the subjects seeing in class. And I could see that math can be applied in every situation.

A significant activity of the second partial for me is the project as well, because I could solve a problem of the real life with my knowledge.

I think that in the third partial there was no activity that was that significant for me, but I like all the activities seen they helped me so much for understanding.

I've learned that calculus can be applied in so much things. It is very important and useful. The activities seen in class helped me to practice and understand better.