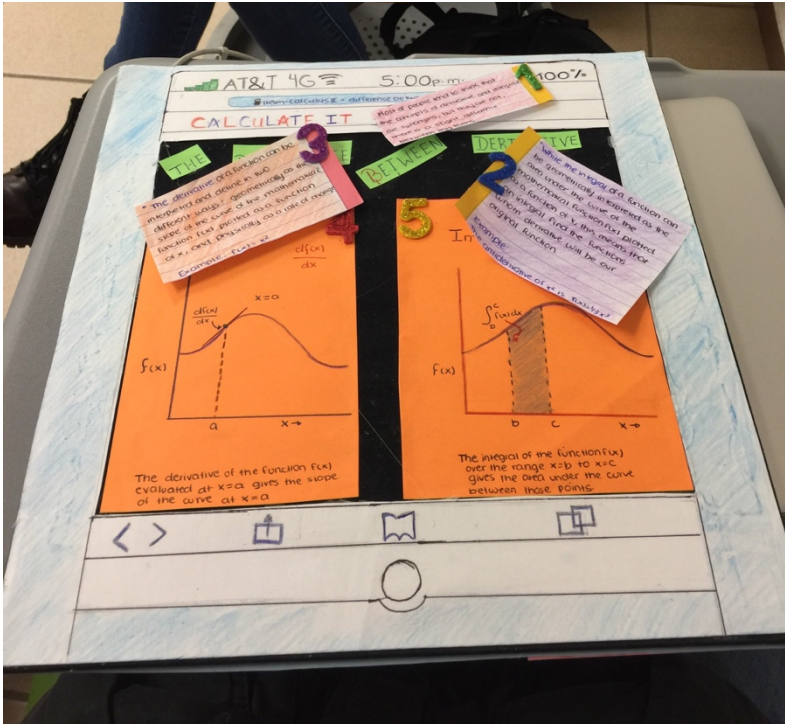


1. First Partial Project



2. Second Partial Project

Elda Sarahi Del Rio Santillan A01570233 cálculo II

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 diferencial

100

Instrucciones:

En equipos de 2 personas realizarás la siguiente actividad

1. Leer detenidamente el caso práctico de un auto y el Expreso Tec que viajan sobre la Av. Paseo de los Leones en dirección Pte.
2. Evaluar en base a los datos dados y usando cálculo diferencial 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
4. Determinar los valores que se te piden del movimiento rotacional del móvil
5. Compararlos con el límite de velocidad permitido en la zona.

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 5 ft/s². Un autobús Expreso Tec viaja en la misma dirección con una velocidad constante de 28 ft/s, sobrepasando al auto.



Para Cálculo II:

a) Determina la velocidad del auto cuando alcanza al autobús

- aceleración de 5 ft/seg² y velocidad de 28 ft/seg

de
ft → m

$$1 \text{ ft} = .3048 \text{ m}$$

$$\frac{5 \text{ ft}}{1 \text{ ft}} \cdot .3048 \text{ m} = 1.524 \text{ m/seg}^2$$

a cte del carro

$$v(11.2) = 17.0688 \text{ m/s}$$

$$\frac{28 \text{ ft}}{1 \text{ ft}} \cdot .3048 \text{ m} = 8.5344 \text{ m/seg}$$

vel cte del camión

cálculos → atrás

Introducción

En el desarrollo de este proyecto que concierne al segundo parcial, se nos pide analizar el caso donde participan un auto y un bus con una velocidad y una aceleración respectivamente. Se estima que procedimientos y cálculos se realicen con conceptos obtenidos en cálculo II.

Analisis y cálculos → siguiente Hoja

conclusión

Para concluir, me atrevo a decir que fui capaz de resolver el planteamiento gracias al conocimiento obtenido de la clase de cálculo II: integrales (antidervadas, área bajo la curva) más lo aprendido en la materia de Energía y Transformación I, el semestre pasado (gráficas).

Se obtuvo el valor de la velocidad que se buscaba, tras un pensamiento crítico y la buena selección de conceptos a utilizar.

cálculos

auto

$a(t) = 1.524 \text{ m/s}^2$

$v_f \rightarrow v(t) = 1.524t + c \text{ m/s}$

$\frac{1.524t^2}{2}$

$x(t) = 0.762t^2 + ct + c$

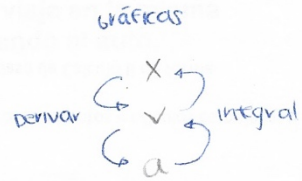
→ La gráfica comienza desde cero
↳ $c = 0$

BUS

$v(t) = 8.5344 \rightarrow$ es cte: no tiene t

$x(t) = 8.5344t + c$

= igualar =



$0.762t^2 + ct + c = 8.5344t + c$

$0.762t = 8.5344$

$t = \frac{8.5344}{0.762} \rightarrow t = 11.2 \text{ seg}$

VF del auto:

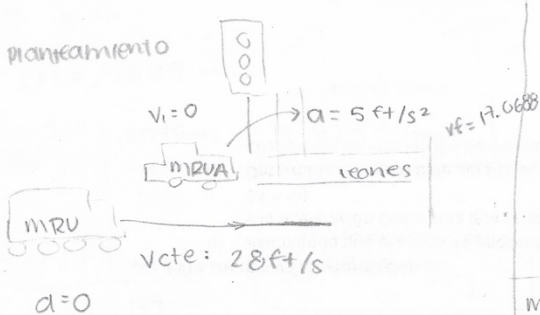
$v(11.2) = 1.524t + c \text{ m/s}$

$v(11.2) = 1.524(11.2) + c$

$v(11.2) = 17.0688 \text{ m/s}$

Análisis

planteamiento



MRUA
acte → carro

→ vel del auto cuando alcanza al autobus

↳ la clave → EL TIEMPO

3. Quiz 1 First Partial (with corrections)

CALCULUS II
FIRST PARTIAL
QUIZ 1A

Name: Elda Sardhi Del Rio Santillan ID#: A01590233 Date: 17 / 01 / 18

90
very good!!!

Answer the following problems with complete procedure.

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

$(3.04)^3$
 $f(x) = x^3$
 $f'(x) = 3x^2$

$x = 3$
 $dx = .04$

$\approx f(x) + f'(x) \cdot dx$
 $\approx x^3 + 3x^2 \cdot dx$
 $\approx (3)^3 + 3(3)^2 \cdot (.04)$
 $\approx 27 + 27 \cdot (.04)$
 $\approx 27 + 1.08$
 ≈ 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)

$f(x) = x^2 - 2x + 3$
 $f'(x) = 2x - 2$
 $(0, 3)$

$y - y_1 = m(x - x_1)$
 $y - 3 = -2(x - 0)$
 $y - 3 = -2x + 0$
 $y = -2x + 3$ ✓

$x = 0$
 $y = 3$
 $f(0) = (0)^2 - 2(0) + 3 = 3$

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

20^3
 $dx = 0.1 \text{ cm}$

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

$x^3 + 3x^2 \cdot dx$
 $dv = 3(20)^2 \cdot .1 \text{ cm}$
 $f'(x) \cdot dx$
 ≈ 120

$V = 20^3 \pm f'(x) \cdot dx$
 $V = 8000 \pm 120 \text{ cm}^3$ ✓

$$V = \pi r^2 h$$

$$dv = \pi 2r dh$$

circle \cdot h
 $\pi r^2 \cdot h$

4. A can is going to be modified in such a way that its height will change from 14cm to 14.8 cm but the diameter of the base will remain as 9cm. $d = 9$ $r = 4.5$ cm $h_1 = 14$ $h_2 = 14.8$ $dh = .8$

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

$$V = \pi r^2 h$$

$$\Delta V = 941.541 - 890.64$$

$$V_1 = \pi (4.5)^2 (14) \\ = 890.64$$

$$\Delta V = 50.9 \text{ cm}^3$$

$$V_2 = \pi (4.5)^2 (14.8) \\ = 941.535$$

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

$$dy = \pi 2r dh$$

$$dh = \Delta h = 14.8 - 14$$

$$dh = 0.8$$

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

$$dv = 22.61 \text{ cm}^3$$

10

correcto*

deriva solo

$$dv = \pi (4.5)^2 h$$

$$dv = 20.25\pi dh$$

$$dv = 20.25 \pi (.8)$$

$$dv = 50.89 \text{ cm}^3$$

BONUS

① Minnesota

② GUS, and

Corrections Quiz 1 First Partial

QUIZ 1A FIRST PARTIAL

4b: Find the approximate change in the volume of the can

$$dv = \pi (4.5)^2 dh$$

$$dv = 20.25 \pi dh$$

$$dv = 20.25 \pi (.8)$$

$$dv = 50.89 \text{ cm}^3$$

$$\Delta v = \Delta h = 14.8 / 19 / 10 = 0.8$$

$$dh = 0.8$$

4. Quiz 2 First Partial (with corrections)

Prepa Tec
Calculus II

Campus Cumbres
1st partial Quiz # 2A

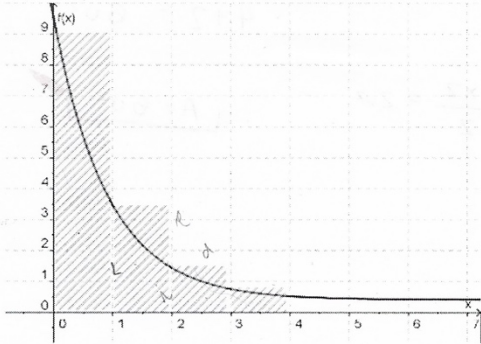
Name Elida Sarahi Del Rio Santillan I.D. ACIS90233 14 March, 2017

24/01/17

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 $f(x)$:

88



- 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.

-10

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

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

$\int_2^4 x dx = 9$
 $-\int_2^4 x dx = -9$

- a. $\int_2^4 (5x^3 + 4x + 6) dx = \underline{348}$
- b. $\int_2^4 23 dx = \underline{101}$
- c. $\int_5^2 x^3 dx = \underline{0}$
- d. $\int_4^2 x dx = \underline{-9}$

$\int_2^4 5x^3 dx + \int_2^4 4x dx + \int_2^4 6 dx$
 $5 \int_2^4 x^3 dx + 4 \int_2^4 x dx + 6 \int_2^4 dx$
 $5(54) + 4(9) + 6(7)$
 $270 + 36 + 42 = 348$

$\int_2^4 23 dx + 23 \int_2^4 dx = 23(7)$

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)

$x_1 = 3$
 $x_2 = 5$

$n = 4$

$f(x) = 9 - x^2$

Area (Left hand) = $\underline{-10.75 \text{ u}^2}$
Area (Right hand) = $\underline{-18.75 \text{ u}^2}$

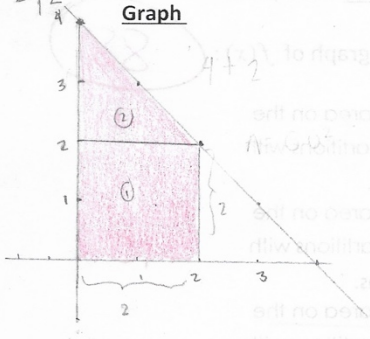
$\Delta x = \frac{b-a}{n}$

$\Delta x = \frac{5-3}{4} = \frac{2}{4} = \frac{1}{2} = 0.5$

left $\left\{ \begin{array}{l} (0.5) f(3) = 0 \\ (0.5) f(3.5) = -1.625 \\ (0.5) f(4) = -3.5 \\ (0.5) f(4.5) = -5.625 \\ (0.5) f(5) = -8 \end{array} \right.$ Right $\rightarrow -18.75 \text{ u}^2$

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)

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



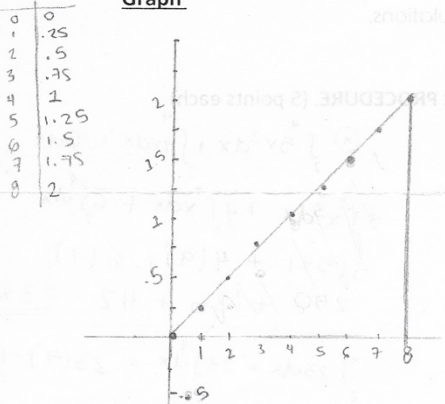
Procedure by geometric formulas

① 1×1
 $2 \times 2 = 4 u^2$
 ② $\frac{b \times h}{2} = \frac{2 \times 2}{2} = 2 u^2$

$4 + 2 = 6 u^2$

$A = 6 u^2$

Graph $\int_0^8 \frac{x}{4} dx$

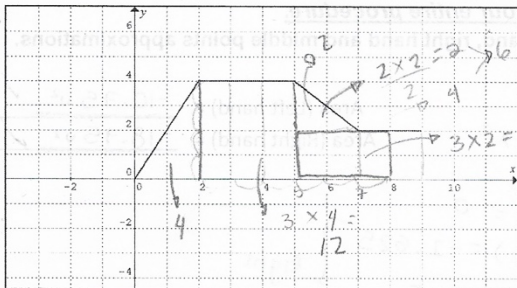


Procedure by geometric formulas

$\frac{b \times h}{2} = \frac{8 \times 2}{2} = \frac{16}{2} = 8$

$A = 8 u^2$

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



① $\frac{b \times h}{2} = \frac{2 \times 4}{2} = 4 + 4 = 8$ $\frac{b \times h}{2} = \frac{1 \times 4}{2} = 4$

② $b \times h = 2 \times 4 = 8$

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

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

2. $\int_2^4 f(x) dx = -8$

4. $\int_0^8 f(x) dx = 24$

Corrections Quiz 2 First Partial

FIRST PARTIAL 2A

AL# 510 10/10/19

I. 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.

IV. (3) 2. $\int_4^2 f(x) dx \rightarrow - \int_2^4 f(x) dx = -8$

