GROUP NAME: Livin' Large

Logo:

Date: 3/26/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Anderson Monken

Writer/Prep: Samantha Kelly

QC/Leader:

Instructions:

1

What is Calculus?

The Study of change, what is changing?
-functions

How is it used?
To find the instantaneous rate of change
Related Rates
Implicit Differentiation

GROUP NAME: The Engineers	Student Names (First and Last)
Logo:	Speaker/Presenter: Jonathon Olchesti
Date: 3/26/13	Writer/Prep: Brian Hahn
Topics:	QC/Leader:

Instructions:

2

2.) If the function S(t) is found to model distance at time t, find the average speed between time = 0 and t = 2 and instantaneous speed at t = 1 if $S(t) = t^2 - 5t + 5$

$$\text{Average Speed} = \frac{y^2 - y^1}{x^2 - x^1} = \frac{S(2) - S(0)}{2-0} = \frac{-1-5}{2-0} = \frac{-6}{2} = -3$$

$$\text{Instantaneous Speed} = S'(t) = 2t - 5$$

$$S'(1) = 2(1) - 5 = -3$$

Ave: -3

Instantaneous: -3

GROUP NAME: Chem Lab Logo:	Student Names (First and Last) Kari-Nichole Speaker/Presenter: Trokon Nywah
Date: 3/26/13 Topics: Midterm	Writer/Prep: QC/Leader:

Instructions: #3

3

$s(t) = t^2 - 5t + 5$

@ $t = 2$ $s'(2) = (2)^2 - 5(2) + 5$

$\boxed{s'(2) = -1 \text{ ft/sec}}$

@ $t = 0$ $s'(0) = (0)^2 - 5(0) + 5$

$\boxed{s'(0) = 5 \text{ ft/sec}}$

The function is continuous by the intermediate value theorem. Yes it is true that distance will equal 0 @ one point because there's a positive & negative number

GROUP NAME: Sexxy Bidress

Logo:

Date: 3/26/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Harold Francis

Writer/Prep: Ashley Bolyard

QC/Leader: Chris K.

Instructions: Find y' if $y = \dfrac{\cos(3x^2+7)}{x}$

4

$$y = \frac{\cos(3x^2+7)}{x} \quad \cancel{X} \quad \frac{\cos(3x^2+7)x}{x^2}(6x) \quad \cancel{X} \quad \frac{6x(-\sin(3x^2+7)) + (\cos(3x^2+7))}{x^2}$$

$$y' = \frac{x \cdot \frac{d}{dx}\cos(3x^2+7) - \cos(3x^2+7)\cdot 1}{x^2}$$

$$= \frac{x(-\sin(3x^2+7))\cdot\frac{d}{dx}(3x^2+7) - \cos(3x^2+7)}{x^2}$$

$$= \frac{-x(\sin(3x^2+7)\cdot 6x - \cos(3x^2+7)}{x^2}$$

$$= \frac{-6x^2\sin(3x^2+7) + \cos(3x^2+7)}{x^2}$$

GROUP NAME: Sex Cells	Student Names (First and Last)
Logo:	Speaker/Presenter: Luke
Date: 3/26/13	Writer/Prep: Kayla
Topics:	QC/Leader:

Instructions:

5

$$y = e^{2x} \sin^{-1}(\ln x)$$

$$y' = e^{2x} \cdot \frac{d}{dx} \sin^{-1}(\ln x) + \sin^{-1}(\ln x) \cdot \frac{d}{dx} e^{2x}$$

$$e^{2x} \cdot \frac{1}{\sqrt{1-(\ln x)^2}} \cdot \frac{d}{dx} \cdot \ln(x) + \sin^{-1}(\ln x)\, e^{2x} \cdot \frac{d}{dx} 2x$$

$$y' = \boxed{\frac{e^{2x}}{\sqrt{1-(\ln x)^2}} \cdot \frac{1}{x} + \sin^{-1}(\ln x)\, e^{2x} \cdot 2}$$

$$\frac{e^{2x}}{x\sqrt{1-(\ln x)^2}} + 2e^{2x} \sin^{-1}(\ln x)$$

$$e^{2x}\left(\frac{1}{x\sqrt{1-(\ln x)^2}} + 2\sin^{-1}(\ln x)\right)$$

GROUP NAME: Sexxy Bidness

Logo:

Date: 3/26/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Harold Francis

Writer/Prep: Ashley Bolyard

QC/Leader: Christian Y

Instructions: Use logarithmic differentiation to find y' if $y = x^{\tan x}$

6

$\ln y = \ln x^{\tan x}$

$\ln y = \tan x \ln x$ take the ln of both sides

property of logs

$\frac{1}{y}\frac{dy}{dx} = \sec^2 x \ln x + \frac{1}{x}\tan x$

Differentiate Both Sides

Product Rule

Multiply both sides by y $\quad y' = y(\sec^2 x \ln x + \frac{1}{x}\tan x)$

Final Answer

$y' = x^{\tan x}\left(\sec^2 \ln x + \frac{\tan x}{x}\right)$

GROUP NAME: Premature Calculations

Logo:

Date: 3/26

Topics: Midterm Prac. # 7

Student Names (First and Last)

Speaker/Presenter: Mike

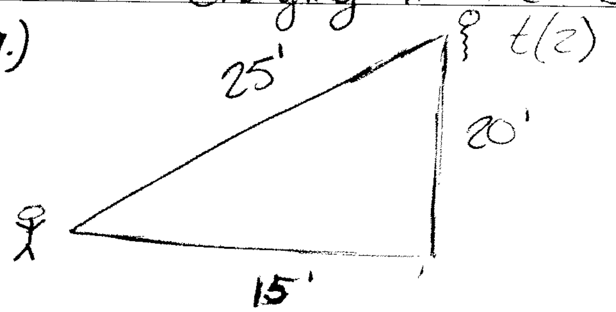
Writer/Prep: Dan Oldenburg

QC/Leader:

Instructions: An observer watches a balloon that is 15 feet away along the ground rise into the air. After 2 seconds, how fast is the distance between the person & balloon changing if the balloon is rising at a rate of 10 feet/sec?

7

7.)



$$\left.\begin{aligned} x &= 15^{ft} \\ y &= 20^{ft} \\ z &= 25^{ft} \end{aligned}\right\} \text{at } t = 2\text{sec.}$$

distance = rate (t)

$d = 10\frac{ft}{s}(2\text{sec})$

$d = 20^{\text{feet}}$

$y = 20$

$$x^2 + y^2 = z^2$$

$$\frac{d}{dt}\; x^2 + y^2 = z^2$$

$$2x\frac{dx}{dt} + 2y\frac{dy}{dt} = 2z\frac{dz}{dt}$$

$$\cancel{2x(0)} + 2y\left(10\tfrac{ft}{s}\right) = 2z\frac{dz}{dt}$$

$$2(20^{ft})\left(10\tfrac{ft}{s.}\right) = 2(25^{ft})\frac{dz}{dt}$$

$$\frac{400}{50} = \frac{\cancel{50}}{\cancel{50}}\frac{dz}{dt}$$

$$8 = \frac{dz}{dt}$$

★ The distance between the person and the balloon is changing at a rate of 8 feet per second at $t = 2s$.

GROUP NAME: The engineers

Logo:

Date: 3/26/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Jonathan Olchesk.

Writer/Prep: Brian Hahn

QC/Leader:

Instructions:

8

8.) Approximate the square root of 70 using differentials.

$\boxed{Y = x^{\frac{1}{2}}}$

$\frac{d}{dx}(Y) = \frac{d}{dx}(x^{\frac{1}{2}})$

$\frac{dy}{dx} = \frac{1}{2}x^{-\frac{1}{2}} \cdot$ [redacted] $\Rightarrow \boxed{dy = \frac{1}{2}x^{-1/2}dx}$

$f(x) = \sqrt{x}$

$\frac{dy}{dx} = \frac{1}{2\sqrt{x}} \cdot$ [redacted]

We know $8^2 = 64$ ~~thus $\Delta x = 6$~~

$\boxed{\text{at } x = 64 \quad 64^{-1/2} = \frac{1}{8}}$

$\frac{dy}{dx} = \frac{1}{2\sqrt{64}}$ [illegible]

$\boxed{dy = \frac{1}{2}\frac{1}{8}dx}$ close to 70.

$\frac{dy}{dx} = \frac{3}{8}$

$\boxed{dy = \frac{1}{16}dx}$

$Y = 8 + \frac{3}{8} = 8.375$

Actual $\sqrt{70} = 8.367$

$\boxed{dx = 70 - 64 = 6}$

$\boxed{dy = \frac{1}{16} \cdot 6 = \frac{3}{8}}$

Linearize at $X = 64$

$Y'(64) = \frac{1}{2\sqrt{64}} = \frac{1}{16} = m$

Point $(64, 8)$

$Y - 8 = \frac{1}{16}(X - 64)$

$Y - 8 = \frac{1}{16}(70 - 64)$

$Y = 8\,3/8$

Since $\sqrt{X} = \sqrt{64} = 8 = y$

$y + dy = 8 + \frac{3}{8}$

$= 8.375$

GROUP NAME: Happy Days Logo:	Student Names (First and Last) Speaker/Presenter: [illegible]
Date: 3/21/13 Topics:	Writer/Prep: [illegible] QC/Leader: [illegible]

Instructions: Midterm Review

9

Use the definition of the derivative to find the derivative of the function $f(x) = 4x^2$?

$$\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$4(x+h)^2$$

$$\lim_{h \to 0} \frac{4(x+h)^2 - (4x^2)}{h}$$

$$4(x^2 + 2xh + h^2)$$

$$4x^2 + 8xh + 4h^2$$

$$\lim_{h \to 0} \frac{8xh + 4h^2}{h}$$

$$\lim_{h \to 0} 8x$$

GROUP NAME: Livin' Large	Student Names (First and Last)
Logo:	Speaker/Presenter: Anderson Monhen
Date: 3/26/13	Writer/Prep: Samantha Kelly
Topics:	QC/Leader:

Instructions:

10

Find the equation of the line tangent to the curve at $x=1$ for $f(x)=4x^2-7$

$f'(x) = \frac{d}{dx}4x^2 - \frac{d}{dx}7$

$= 8x \quad f'(1) = 8(1) = 8$

Slope

$f(1) = 4(1)^2 - 7$

$= -3$

$(1, -3)$

$y-(-3) = 8(x-1)$

$y+3 = 8x-8$

$y = 8x-8-3$

$= 8x-11$

$\boxed{y = 8x - 11}$

GROUP NAME: Team Build

Logo: Δ

Date: 3/26

Topics:

Student Names (First and Last)

Speaker/Presenter: Latoya Wimbush

Writer/Prep: Luciano Nujem

QC/Leader: Chris Sholy

Instructions:

II

$$\lim_{x\to\infty} \frac{\sin(x^{\tan x})}{x}$$

$y = (\sin(x \wedge \tan(x)))/x$

Calculator table:

X	Y
999	$1E^{-31}$
99999	$2E^{-39}$
999999	$2E^{-46}$
$\downarrow$	$\downarrow$
∞	0

eventually goes to zero

* anything divided by infinite, is zero

or

$$\frac{-1}{x} \le \frac{\sin(\ )}{x} \le \frac{1}{x}$$

$$\lim_{x\to\infty} \frac{-1}{x} \le \lim_{x\to\infty} \frac{\sin()}{x} \le \lim_{x\to\infty} \frac{1}{x}$$

$$0 \le \ ? \ \le 0$$

by squeeze theorem.

$$? = \lim_{x\to\infty} \frac{\sin(x^{\tan x})}{x} = 0$$

GROUP NAME: Dope	Student Names (First and Last)
Logo: $	Speaker/Presenter: Ryan Piotrowski
Date: 3/26/13	Writer/Prep: Bishop Brer
Topics:	QC/Leader: Ethan stewart

Instructions: $\lim_{x\to\infty} x^2 e^{-3x}$

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$$\lim_{x\to\infty} x^2 e^{-3x}$$

$$\lim_{x\to\infty} x^2 e^{-3x}$$

$$\lim_{x\to\infty} \frac{x^2}{e^{3x}} = \frac{\infty}{\infty}$$ use LHR

$$\lim_{x\to\infty} \frac{2x}{e^{3x}\cdot 3} = \frac{\infty}{\infty}$$ use LHR

$$\lim_{x\to\infty} \frac{2}{9e^{3x}} = \frac{2}{\infty} = 0$$

GROUP NAME: Sex Cells

Logo:

Date: 3/26/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Luke

Writer/Prep: Kayla

QC/Leader:

Instructions:

13

$$\lim_{x\to\infty} \frac{3x^2+x-7}{x^2+2x+4} = \infty \quad \text{LH Rule}$$

$$\lim_{x\to\infty} \frac{6x+1}{2x+2} = \infty \quad \text{LH Rule}$$

$$\lim_{x\to\infty} \frac{6}{2} = 3$$

GROUP NAME: Team Build

Logo: △

Date: 3/27/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Luciano Najem

Writer/Prep: Latoya Wimbush

QC/Leader: Chris Sholy

Instructions: Use the δ-ε definition of limits to show that $\lim_{x \to 2} (2x-3) = 1$

14

$|f(x) - L| < \varepsilon$

$|(2x-3) - 1| < \varepsilon$

$|2x - 4| < \varepsilon$

$2|x-2| < \varepsilon$

$x - 2 < \frac{\varepsilon}{2} = \delta$

$L = 2(2) - 3$

$1 = 1$

GROUP NAME: Dopc Logo:	Student Names (First and Last) Speaker/Presenter: Ryan Piotrowski
Date: 3/26/13 Topics:	Writer/Prep: Bishop Barr QC/Leader: Ethan Stewart

Instructions:

15

$\pm .5$ $\pm .05$

width is 8

$$A = L * W$$

$$dA = L \cdot dW + W \cdot dL$$

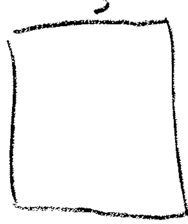
$$dA = 3(\pm .05) + 8(\pm .5)$$

$$= \pm .15 + \pm 4$$

$$24 \pm \underline{\underline{4.15}}$$

$x \pm .5$

$3 \pm .5$



$8 \pm .05$

$2.5 \cdot 7.95 = 19.875$ $4.\underline{\underline{125}}$

$3 \cdot 8 = 24$

$3.5 \cdot 8.05 = 28.175$ $4.\underline{\underline{175}}$