

GROUP NAME: <u>CSC</u>	Student Names (First and Last)
Logo:	Speaker/Presenter: <u>Stephen</u>
Date: <u>10/21/13</u>	Writer/Prep: <u>Courtney</u>
Topics:	QC/Leader: <u>CORNEAL</u>

Instructions: practice  
Midterm.

# 2

1

if  $t=0$  ;  $t=2$   
speed @  
 $t=1$

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

$$t=0 \Rightarrow (0)^2 - 5(0) + 5 = 5$$

$$t=2 \Rightarrow (2)^2 - 5(2) + 5 = -1$$

plug in answers

$$\frac{-1-5}{2-0} = \frac{-6}{2} = \boxed{-3}$$

Average  $\rightarrow -3$

Instantaneous  $\rightarrow -3$

$$s' = 2t + 5$$

$$s'(1) = 2(1) + 5 = \boxed{-3}$$

a) What is calculus?

- the study of change

b) How is it used?

- to find the slope of a tangent line

<p>GROUP NAME: _____</p> <p>Logo: _____</p>	<p>Student Names (First and Last)</p> <p>Speaker/Presenter: <u>Vanessa Stewart</u></p>
<p>Date: _____</p> <p>Topics: <u>math</u> <u>etc.</u></p>	<p>Writer/Prep: <u>Ryan</u></p> <p>QC/Leader: _____</p>

Instructions: 3


3. it true + the  
 most = 0  
 = 2  
 + 20 = 22

$S(0) =$   
 $S(2)$

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

Polynomials. →  
 Continuous.  
Everywhere

$S(0) = 5$   
 $S(2) = 4 - 10 + 5 = -1$

<p>GROUP NAME: IRISH MATH BOMBS</p> <p>Logo: </p>	<p>Student Names (First and Last)</p> <p>Speaker/Presenter: <u>Bobby O'Connor</u></p>
<p>Date: _____</p> <p>Topics: _____</p>	<p>Writer/Prep: <del>Connor</del> <del>Krupsmann</del></p> <p>QC/Leader: <u>Billy Madison Smith</u></p>

Instructions: 4

Find  $y'$  if  $y = \frac{\cos(3x^2 + 7) (f)}{x (g)}$

Quotient Rule

$$\frac{y f' - f g'}{g^2}$$

$$= \blacksquare \times \frac{[-\sin(3x^2 + 7) (6x)] - (\cos(3x^2 + 7)) (1)}{x^2}$$

Chain Rule

$$y' = \frac{x [-\sin(3x^2 + 7) (6x)] - (\cos(3x^2 + 7)) (1)}{x^2}$$

GROUP NAME: <u>Wolf Pack</u>	Student Names (First and Last)
Logo:	Speaker/Presenter: <u>DE</u>
Date: <u>10/21/13</u>	Writer/Prep: <u>Jared Schuster</u>
Topics:	QC/Leader: <u>C.B.</u>

Instructions: Practice Mid term

Find  $y'$  if  $y = e^{2x} \sin^{-1}(\ln x)$  Product Rule

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

Chain Rule

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

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

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

Product Rule

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

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

Chain Rule

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

<p>GROUP NAME: IRISH WITH BOMBS</p> <p>Logo:</p>	<p>Student Names (First and Last)</p> <p>Speaker/Presenter: <u>Bobby O'Connor</u></p>
<p>Date: _____</p> <p>Topics:</p>	<p>Writer/Prep: <u>Connor Kruppman</u></p> <p>QC/Leader: <u>William Smith</u></p>

Instructions: 6

Use logarithmic differentiation to find  $y'$ ,  $y = x^{\tan x}$

$y = x^{\tan x}$

~~$y' = \frac{d}{dx} (x^{\tan x})$   
 $= \frac{d}{dx} (e^{\ln(x^{\tan x})})$   
 $= \frac{d}{dx} (e^{\tan x \ln x})$   
 $= e^{\tan x \ln x} \cdot \frac{d}{dx} (\tan x \ln x)$   
 $= x^{\tan x} (\sec^2 x \ln x + \frac{\tan x}{x})$~~

$\ln(y) = \ln(x^{\tan x})$  (log of both sides)

$\ln y = \tan x \cdot \ln x$  (differentiated both sides)

$\frac{d}{dx} \ln y = \frac{d}{dx} (\tan x \cdot \ln x)$  (Chain rule + Product Rule)

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

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

$= (x^{\tan x}) (\sec^2 x \ln x + \frac{\tan x}{x})$  (substitute)

GROUP NAME:

Student Names (First and Last)

Logo:

Speaker/Presenter: Nicola Powell

Date: \_\_\_\_\_

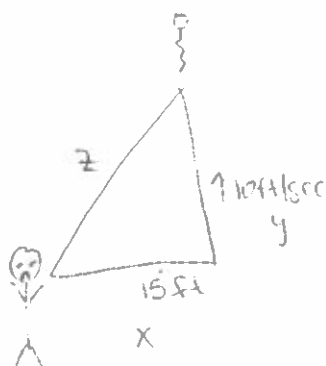
Writer/Prep: Darin Cidrotzen

Topics:

QC/Leader: Kiersten Hendricksen

Instructions:

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$$x = 15$$

$$y = 20$$

25 ← got it using the pythag and the rule

$$\frac{dy}{dt} = 10 \text{ ft/sec}$$

$$\frac{dx}{dt} = 0 \text{ ft/sec}$$

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

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

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

$$2(15)(0) + 2(20)(10 \text{ ft/sec}) = 2(25) \left( \frac{dz}{dt} \right)$$

$$0 + 400 = 50 \frac{dz}{dt}$$

$$\frac{dz}{dt} = 8 \text{ ft/sec}$$

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<p>Date: _____</p> <p>Topics:</p>	<p>Writer/Prep: _____</p> <p>QC/Leader: _____</p>

Instructions:

Find  $\sqrt{70}$  using linearization  $\int$

$\sqrt{64} = 8$  (center =  $a = 64$ )  
 $f(x) = \sqrt{x}$   
 Find Eq of tangent line at  $x = 64$

Point  $(64, 8)$  slope  $f'(64)$

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

$f'(x) = \frac{1}{2} x^{-1/2}$   
 $f'(64) = \frac{1}{2} 64^{-1/2}$

$m = \frac{1}{16}$

$y - y_0 = m(x - x_0)$

$y - 8 = \frac{1}{16}(x - 64)$

8.375

$y = 8 + \frac{1}{16}(x - 64)$

$8\frac{3}{8}$

$y(70) = 8 + \frac{1}{16}(70 - 64) = 8\frac{6}{16}$

<p>GROUP NAME: <u>WOLFPAK</u></p> <p>Logo:</p>	<p>Student Names (First and Last)</p> <p>Speaker/Presenter: _____</p>
<p>Date: <u>2/1/2013</u></p> <p>Topics:</p>	<p>Writer/Prep: <u>DC</u></p> <p>QC/Leader: <u>Jared</u></p>

Instructions: MIDTERM PRACTICE #1

IS THE DEFINITION OF DERIVATIVE TO FIND THE DERIVATIVE OF THE FUNCTION  $f(x) = 4x^2 - 7$

$$\begin{aligned}
 f'(x) &= \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\
 &= \lim_{h \rightarrow 0} \frac{4(x+h)^2 - 7 - (4x^2 - 7)}{h} \\
 &= \lim_{h \rightarrow 0} \frac{4(x^2 + 2xh + h^2) - 7 - 4x^2 + 7}{h} \\
 &= \lim_{h \rightarrow 0} \frac{4x^2 + 8xh + 4h^2 - 7 + 4x^2 - 7}{h} \\
 &= \lim_{h \rightarrow 0} \frac{8xh + 4h^2}{h} \\
 &= \lim_{h \rightarrow 0} h(8x + 4h) \\
 &= 8x + 4(0) \\
 &= 8x
 \end{aligned}$$



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<p>Date: _____</p> <p>Topics:</p>	<p>Writer/Prep: <u>Logan Hadenbury</u></p> <p>QC/Leader: <u>Aidan / Logan</u></p>

Instructions: *find the...*

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~~XXXXXXXXXX~~

$\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} = f'(x)$

$f'(1) = 8$

~~Y~~  
tangent line.

$L(x)$  linearized function  
= equation of  
tangent line.

GROUP NAME: Mr. B. King

Student Names (First and Last)

Logo:

Speaker/Presenter: Angelica J.

Date: 10/21/13

Writer/Prep: Shirley G. G.

Topics: Mid Term Project

QC/Leader: Eugene P. King

Instructions:

Evaluate (1) using more complicated limits

1)  $\lim_{x \rightarrow 0} \frac{\sin(x)}{x}$

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

Squeeze theorem

$$\lim_{x \rightarrow 0} -1 \leq \lim_{x \rightarrow 0} \frac{\sin(x)}{x} \leq \lim_{x \rightarrow 0} \frac{1}{x}$$

$$\lim_{x \rightarrow 0} -1 = -1 \quad \lim_{x \rightarrow 0} \frac{1}{x} = \infty$$

$$\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1$$

GROUP NAME:

Logo:

apples 2 Apples

Date: 10/21/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Tom

Writer/Prep: Steve H

QC/Leader: Anna

Instructions:

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

$$x^2 e^{-3x} \rightarrow \frac{x^2}{1} \cdot \frac{1}{e^{3x}} \quad \frac{x^2}{e^{3x}}$$

$$\lim_{x \rightarrow \infty} \frac{x^2}{e^{3x}} = \frac{\infty}{\infty}$$

$$\lim_{x \rightarrow \infty} \frac{2x}{e^{3x} \cdot 3} = \frac{\infty}{\infty}$$

~~The~~  $e^{3x}$  increases <sup>at a</sup> faster rate than  $x^2$

~~2x < 3e^{3x}~~

The limit as  $x$  approaches infinity for  $x^2 e^{-3x}$  is zero

$$\lim_{x \rightarrow \infty} \frac{2}{e^{3x} \cdot 3} = \frac{2}{\infty} = 0$$

GROUP NAME:

Student Names (First and Last)

Logo:

Speaker/Presenter: E. Van ...

Date: 12/1/2

Writer/Prep: Ryan ...

Topics:

QC/Leader: \_\_\_\_\_

Instructions:

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*[Faint handwritten notes and diagrams, including a large wavy line.]*

$$\lim_{x \rightarrow \infty} \frac{3 + \frac{1}{x} - \frac{7}{x^2} - 3}{1 + \frac{2}{x} + \frac{4}{x^2} - 3}$$



# Error (using differentials)

The error in a value "y" is represented as  $dy$ .

$$\text{So } \frac{dy}{dx} = f'(x) \quad \text{and } dy = f'(x) dx$$

The error in a measure for "x" is  $dx$

$$\text{So } A = L \cdot W$$

$$L = 3 \pm .5 \leftarrow dL$$

$$W = 8 \pm .05 \leftarrow dW$$

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

$$3 \cdot (.05) + 8 \cdot (.5)$$

$$.15 + 4$$

$$\pm 4.15$$

$$8.0$$

$$8.00 \pm .00$$

$$A = L \cdot W = 24$$

$$\text{Area is } 24 \pm 4.15$$

error

$$\frac{4.15}{24}$$

+100%

17.29%

<b>GROUP NAME:</b> <u>WOLF PACK</u>	<b>Student Names (First and Last)</b>
<b>Logo:</b>	<b>Speaker/Presenter:</b> <u>Jared</u>
<b>Date:</b> <u>4/2</u>	<b>Writer/Prep:</b> <u>DC</u>
<b>Topics:</b>	<b>QC/Leader:</b> <u>Quinn</u>

**Instructions:**

§ 2001

$2002 \times 10 \times 2.5 = 5005$

<b>GROUP NAME:</b>	<b>Student Names (First and Last)</b>
<b>Logo:</b>	<b>Speaker/Presenter:</b> <u>Bobby O'Connor</u>
<b>Date:</b> _____	<b>Writer/Prep:</b> _____
<b>Topics:</b>	<b>QC/Leader:</b> <u>William Smith</u>

**Instructions:**

$$X = 5 \quad Y = 15.048 \pm 1.03$$

in 1945 the price of PPR is  $15.04 \pm 1.03$



GROUP NAME: Time Is Money



Logo:

Student Names (First and Last)

Speaker/Presenter: Angelika Mazurek

Writer/Prep: Shyam Singh (Shiv)

QC/Leader: Eugenio Pelaez

Date: 10/21/13

Topics:

Instructions:

ERROR VALUE

Sale of IPH = 45  $\square$

$$x = 5 \quad Y = 257.8 \pm 1(.5) = .5$$

$$233,166 \times .5$$

$$257.8 \pm 116.58$$

Error is huge.

In year 5 price of IPH = 45 is \$257.8  $\pm$  116.58.

GROUP NAME: <u>LSC</u>	Student Names (First and Last)
Logo:	Speaker/Presenter: <u>Corneal</u>
Date: _____	Writer/Prep: <u>Stephen</u>
Topics:	QC/Leader: <u>Courtney</u>

Instructions:

$$x = 9$$

$$y = \cancel{216.69}$$

$$\cancel{y = 75.633}$$

$$y = 216.69 \pm \frac{75.633}{2}$$

In 2009 our stock price was 216.69  
with a error of 37.8165

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<p>Date: <u>10/21</u></p> <p>Topics:</p>	<p>Writer/Prep: <u>Steve C</u></p> <p>QC/Leader: <u>Tom</u></p>

Instructions:

$$X=3$$

$$y = 19.933 \pm \left( \frac{1}{2} \right)^{\frac{1}{2}}$$

$$y = 19.933 \pm (2.7936311)^{\frac{1}{2}}$$

$$y = 19.933 \pm 1.396925 =$$

Substituting  $x=3$  into  $y = 19.933 \pm 1.396925 =$