GROUP NAME: Date:	Student Names (First and Last) Speaker/Presenter: Kero Writer/Prep: Leader/Collaborator:
Independant Variable (x-axis): Dependant Variable (y-axis):	

Conclusion (in words):

Mid. #1 & #2

Supporting Work:

$\boxed{1}$) what is calculus?

- study change of function

Study of change

Derivative → slope of tangent line

Instantaneous Rate of change

$0 \cdot \infty$ = unknown

$\boxed{2}$ $\frac{S(8) - S(0)}{8 - 0} = \frac{[.5(8)^3 - 3] - 3}{8}$

$= \frac{256}{8} = 32$ → Ave

$\frac{S(8)-S(0)}{8-0} = \frac{256}{8} = 32$

$s' = 3(.5)t^2$

$s'(4) = 3(.5) \cdot 16 = 24$ → Instantaneous

$s' = 3(.5)t^2$

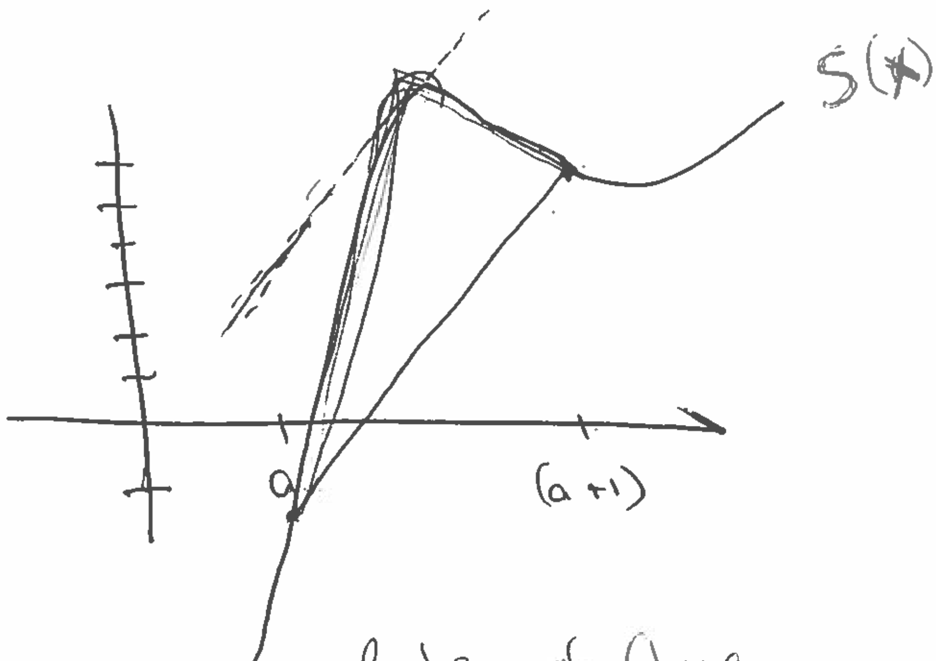
$s'(4) = 24$

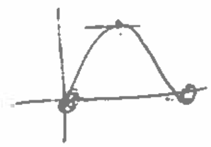
GROUP NAME: Michael Vetrick	Student Names (First and Last)
Date:__________	Speaker/Presenter: __________
	Writer/Prep: __________
Independant Variable (x-axis): __________	Leader/Collaborator: __________
Dependant Variable (y-axis): __________	

Conclusion (in words):

Mid #3

Supporting Work:





$S'(x) = 7$

Average Rate of Change

Instant

$$\frac{S(a+1) - S(a)}{a+1-a} \Rightarrow \frac{-1-6}{a-(a+1)} = \frac{-7}{-1} = 7 = S'(x)$$

average rate of change = 7

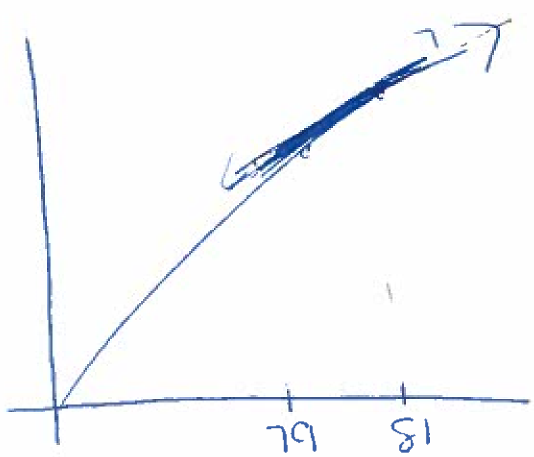
Mean Value Theorem states that ~~the~~ ~~a~~ ~~is~~ there is a derivative that equals the average rate of change between two points. ~~[illegible]~~ + differentiable.

GROUP NAME: Date:________	Student Names (First and Last) Speaker/Presenter: ________ Writer/Prep: Courtney Leader/Collaborator:________
Independant Variable (x-axis):________ Dependant Variable (y-axis): ________	

Conclusion (in words):

Mid #4

Supporting Work:



Equation of Tangent Line

(a) $a=81$ point $(81,3)$

$f(x) = x^{\frac{1}{4}}$ $\quad f'(x) = \frac{1}{4}x^{-\frac{3}{4}}$

$f(81) = \frac{1}{4}\, 81^{-\frac{3}{4}} = \frac{1}{108}$ M_{tan}

$y = y_1 + m(x - x_1)$

$\boxed{y = 3 + \frac{1}{108}(x - 81)}$ Slope

(b) $y = 3 + \frac{1}{108}(79 - 81) = 3 - \frac{1}{54}$

Approx $y = 2.981481481 = 2\frac{53}{54}$

Actual $\sqrt[4]{79} = 2.981307501 \approx 3$

(b) $\lim_{x \to 0^-} \frac{\sin(8x)}{2\cos x - 2} = \frac{0}{0}$

use L'Hopital Rule

GROUP NAME: $\lim_{x \to 0^-} \frac{8\cos(8x)}{-2\sin(x)} = \frac{8}{(-2)(-0)}$ $= +\infty$

Date:__________

Student Names (First and Last) Ahmed!

Speaker/Presenter: __________

Writer/Prep: __________

Leader/Collaborator: __________

Independant Variable (x-axis): __________

Dependant Variable (y-axis): __________

Conclusion (in words):

Mid #5

Supporting Work:

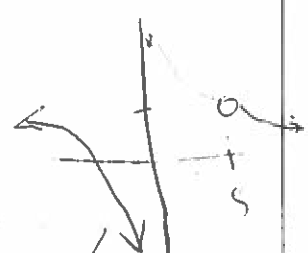
(a) $Y = \frac{x^2 - 25}{x^2 - 5x} = \frac{\cancel{(x-5)}(x+5)}{x\cancel{(x-5)}}$ $\lim_{x \to 4} \frac{x+5}{x} = \frac{9}{4}$

(b) $\lim_{x \to 0} = $ undefined co2 $\frac{0+5}{0} =$

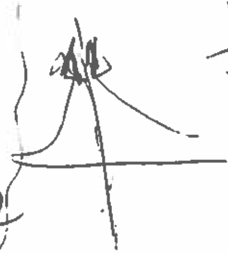
(Vertical Asymtote) $\lim_{x \to 0} \frac{1}{x} = \pm\infty$ = UND.

(c) $\lim_{x \to 5} y = \frac{10}{5} = 2$

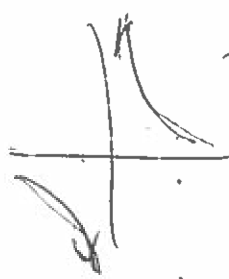
Hole at (5, 2)



(b) $\lim_{x \to 0^-} \frac{\sin(8x)}{2\cos x - 2}$



$\frac{1}{x^2}$



$\frac{1}{x}$

$\lim_{x \to 0} \frac{1}{x^2} = \infty$

$\lim_{x \to 0} \frac{1}{x} = $ UND

$\lim_{x \to 0^+} \frac{1}{x} = \infty$

GROUP NAME: TDF Date:__________	Student Names (First and Last) Speaker/Presenter: __________
Independant Variable (x-axis):__________ Dependant Variable (y-axis): __________	Writer/Prep:__________ Leader/Collaborator:__________

Conclusion (in words):

Mid #6

Supporting Work:

6 a) $g(\cancel{x}) = \frac{\cosh(x)}{e^x}$ Quotient rule

$$\frac{d}{dx} g(x) = \frac{e^x \sinh(x) - \cosh(x) e^x}{(e^x)^2}$$

$(e^x)^2 = e^{2x}$

or

$$\frac{d}{dx} g(x) = \frac{\cancel{e^x}(\sinh(x) - \cosh(x))}{(e^x)^2}$$

$$\frac{d}{dx}(g(x)) = \frac{\sinh(x) - \cosh(x)}{e^x}$$

b) $K(t) = \tan(\sin^{-1}(t))$ Chain Rule

$$\frac{d}{dt} K(t) = \sec^2(\sin^{-1}(t)) \cdot \frac{1}{\sqrt{(1-t^2)}}$$

$$\frac{d}{dt} K(t) = \frac{\sec^2(\sin^{-1}(t))}{\sqrt{1-t^2}}$$

Given

$$\frac{d}{d\cancel{x}} \sin^{-1}(\cancel{x}) = \frac{1}{\sqrt{1-\cancel{x}^2}}$$

GROUP NAME:

Date:____________

Student Names (First and Last)

Speaker/Presenter: ____________

Writer/Prep:____________

Leader/Collaborator:____________

Independant Variable (x-axis):____________

Dependant Variable (y-axis): ____________

Conclusion (in words):

Kathleen H.

Mid #7 $\left\{ (\sec(t))^{2t}\left[2t\tan(t) + 2\ln(\sec(t))\right]\right.$

Supporting Work:

Derivative of
$y = \sec(t)^{2t}$

$\frac{dy}{dx} = y\left[2t\tan t + 2\ln(\sec t)\right]$

$\cancel{\frac{dy}{dx} = 2\frac{d}{dx}[\sec(t)]^{2t}}$

$= \cancel{2t\sec(t)\sec(t)\tan(t)}$

$= \cancel{2t\sec^2(t)\tan(t)}$

~~Rule(s): Chain Rule~~

$\frac{dy}{dx} = \sec(t)^{2t}\left[2t\tan t + 2\ln(\sec t)\right]$

$y = \sec(t)^{2t}$ log of both sides

$\ln y = \ln(\sec t)^{2t}$ Ladder property

Log. Differ.

$\ln y = 2t\ln(\sec t)$ Implicit diff.

$\frac{d}{dt}\ln y = \frac{d}{dt}(2t \cdot \ln(\sec t))$ Product Rule

$\frac{1}{y}\frac{dy}{dt} = \left[2t \cdot \frac{1}{\sec t}\sec t\tan t + \ln(\sec t) \cdot 2\right]$

GROUP NAME:

Date: 4/3/14

Independant Variable (x-axis): ____

Dependant Variable (y-axis): ____

Student Names (First and Last)

Speaker/Presenter: ____

Writer/Prep: Jenn

Leader/Collaborator: ____

Conclusion (in words):

Mid #8

Supporting Work:

$\boxed{\text{Balloon}}$ w/ $V = 4\pi r^3/3$ filling @ 45cc/sec at $r=7$ how fast is r growing?

$\boxed{V = \frac{4}{3}\pi r^3}$

$\frac{d}{dt} r^3 = 3r^2 \frac{dr}{dt}$

$$\frac{dV}{dt} = 4\pi r^2 \frac{dr}{dt}$$

$\frac{dV}{dt} \downarrow 45$, $r \downarrow 7$, $\frac{dr}{dt} \downarrow ?$

$$45 = 4\pi(7)^2 \frac{dr}{dt}$$

$$\frac{45}{4\pi(7)^2} = \frac{dr}{dt}$$

$$\frac{dr}{dt} = .073 \text{ cm/sec}$$

at $r = 10$

$$\frac{dv}{dt} = .0358$$

$\frac{d}{dt}$ of Both Sides

If $r = 10$

$$\frac{dr}{dt} = \frac{45}{4\pi(10)^2} < \frac{45}{4\pi(7)^2}$$

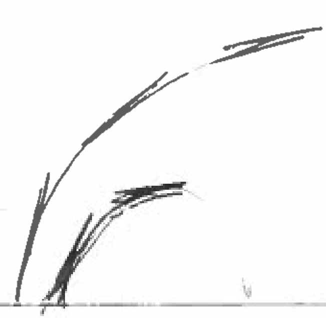
r goes up

$\frac{dr}{dt}$ goes down

or

$r'' < 0$ $r' > 0$

concave down



GROUP NAME:	Student Names (First and Last)
Date:__________	Speaker/Presenter: __________
Independant Variable (x-axis):__________	Writer/Prep: Jason
Dependant Variable (y-axis): __________	Leader/Collaborator:__________

Conclusion (in words):

Mid #9

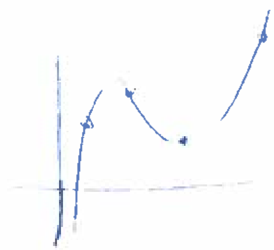
Supporting Work:

L1 Day (x)	L2 Time (y)
1	200
3	400
5	100
7	700

$\boxed{\text{Stat}}$ 1 Edit

$\boxed{\text{Stat}}$ → 6. CubicReg $\boxed{\text{Enter}}$

$\boxed{\text{Y=}}$ $\boxed{\text{Vars}}$ 5 Statistics → → 1 RegEq



$Y = \underline{29.16..}\,x^3 + \underline{-325}\,x^2 + \underline{1020}\,x + \underline{-525}$

-2 $\boxed{\text{STO}}$ → x

x − $\boxed{\text{Vars}}$ → 1 Function 1 Y_1 / $\boxed{\text{Math}}$ 8 nDeriv ($\boxed{\text{Vars}}$ 1 Function 1 Y_1, x, x) $\boxed{\text{STO}}$ → x $\boxed{\text{Enter}}$

$-2 \rightarrow X$

$X - Y_1 / \text{nDeriv}(Y_1, X, X) \rightarrow X$

<enter>

Iteration -2

Iteration -.4164

Iteration .3414

Iteration .603...

Zero .635...

GROUP NAME:	Student Names (First and Last) Milton P
Date:__________	Speaker/Presenter: __________
Independant Variable (x-axis):__________	Writer/Prep:__________
Dependant Variable (y-axis): __________	Leader/Collaborator:__________

Conclusion (in words):

Mid #10

Supporting Work:

Function is continuous? Y/N/?

$x=2$ = No because $\lim_{x\to 2}$ does not exist.

$x=4$ = Yes because the limit exists, $f(x)$ exists at that point $f(a) = \lim_{x\to a}$

$x=6$ = No because the limit isn't the same as $f(x)$.

Function is differentiable? Y/N/?

$x=2$ = No because it is not continuous

$x=4$ = No corner

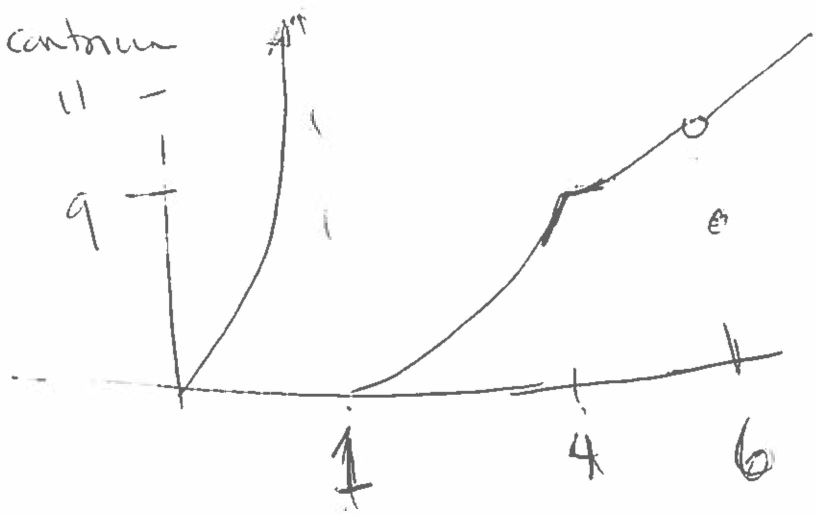
$x=6$ = No because it is not continu

limit from left

$x=2^- = \infty$

$x=4^- = 9$ or 8

$x=6 = 11$ or 10



GROUP NAME:

Date:__________

Student Names (First and Last) Jungyu Lim

Speaker/Presenter: __________

Writer/Prep: __________

Leader/Collaborator: __________

Independant Variable (x-axis): __________

Dependant Variable (y-axis): __________

Conclusion (in words):

Mid #11

Supporting Work:

$f(x) = x(x-5) = x^2 - 5x$

$f'(x) = 2x - 5$

$f'(2) = 4 - 5 = \underline{-1}$

$\lim\limits_{x \to 2} f(x) = 2^2 - 5 \cdot 2 = 4 - 10 = \underline{-6}$

$\Downarrow$

$f(2)$

$\lim\limits_{h \to 0} \dfrac{f(2+h) - f(2)}{h} = f'(2)$

$\lim\limits_{h \to 0} \dfrac{(2+h)(2+h-5) - 2(-3)}{h}$

$\lim\limits_{h \to 0} \dfrac{4 + 4h + h^2 - \cancel{10} - 5h + \cancel{6}}{h}$

$\lim\limits_{h \to 0} \dfrac{-h + h^2}{h} =$

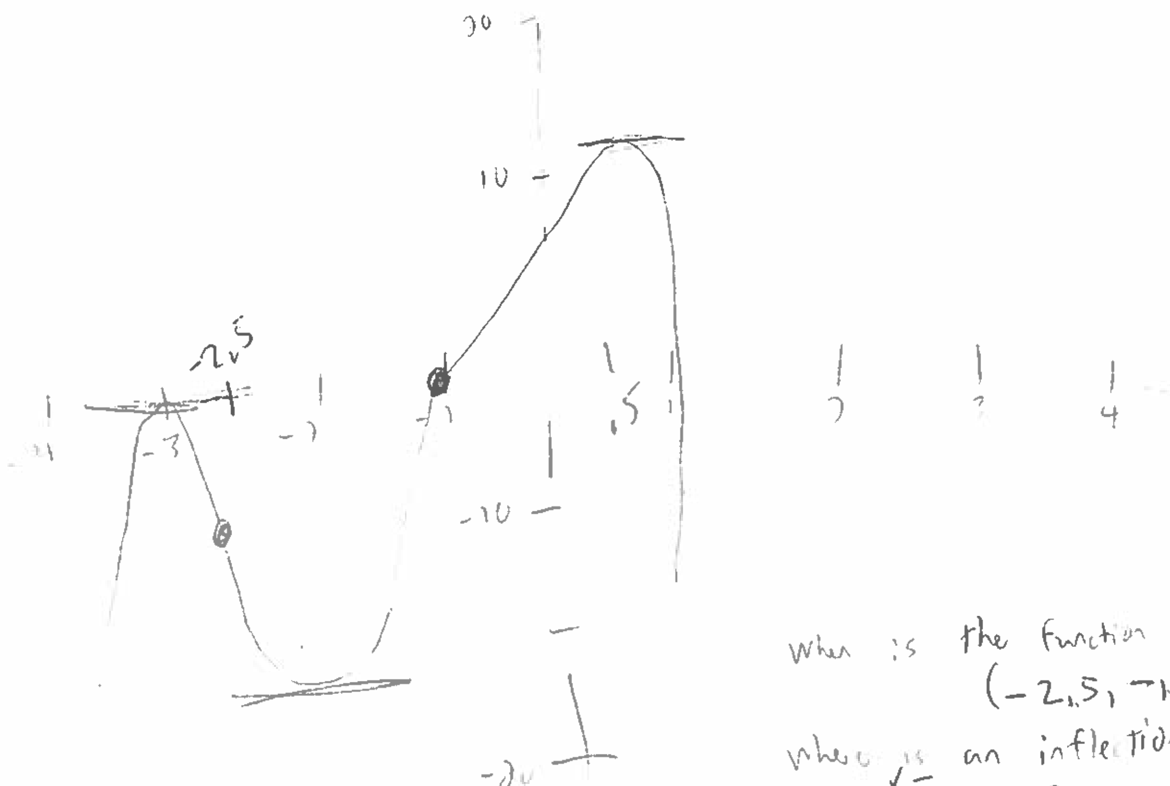
$\lim\limits_{h \to 0} -1 + \cancel{h} = -1$

GROUP NAME:	Student Names (First and Last)
Date:___________	Speaker/Presenter: ___________
Independant Variable (x-axis):___________	Writer/Prep:___________
Dependant Variable (y-axis): ___________	Leader/Collaborator:___________

Conclusion (in words):

Mid #12

Supporting Work:



When is the function concave up?

$(-2.5, -1)$

where is an inflection point?

$x = -2.5, -1$

where are the extrema?

$-3, -2, .5$

(When is the function decreasing and concave down?

X vales $(-3.0, -2.5) \cup (.5, \infty)$

$(-3, -2.5) \cup (.5, \infty)$

GROUP NAME: Date:__________	Student Names (First and Last) Speaker/Presenter: Charles Writer/Prep:__________
Independant Variable (x-axis):__________ Dependant Variable (y-axis): __________	Leader/Collaborator:__________

Conclusion (in words):

Mid #13

Supporting Work:

$P = 100$ find max dimension $(L \times W)$

OPTIMIZATION

$2L + 2W = 100$

$L + W = 50$

$W = 50 - L$

$A = LW$

$A = L(50 - L) = -L^2 + 50L$

$L(50-L)' = -2L + 50$

$2L = 50$

$L = 25$

$25 + W = 50$

$W = 25$

Dimension $(L \times w) = 25 \times 25$

GROUP NAME:

Date:

Independant Variable (x-axis):

Dependant Variable (y-axis):

Student Names (First and Last)

Speaker/Presenter: Jenna

Writer/Prep:

Leader/Collaborator:

Conclusion (in words): E1 #1 & #2

Supporting Work:

What is calc - study of change in functions

" derivative - slope of the tangent line

- instantaneous rate of change

" 3 conditions for continuity at a point "a"

- limit exists $\lim_{x \to a} f(x)$ exists
- function exists
- $\lim_{x \to a} F(x) = F(a)$

✓

2 average rate of change between $x = 1$ $x = \cancel{3}\, 5$

☆ had an error ☆ LVIC

$\frac{Y_1(3) - Y_1(1)}{3 - 1}$

$\frac{17 - 5}{5 - 1} = \frac{12}{4} = 3$

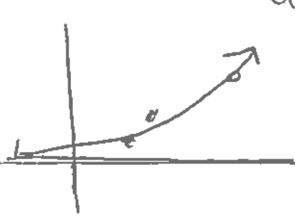
Find the regression

ExpReg

$y = a * b^x$

$a = 3.74$

$b = 1.35$



Answer = $\boxed{1}$

Find instantaneous ReQ @ 2.

$m_{Tan} = \frac{dy}{dx}$ $x = 2$

$\frac{dy}{dx} = \boxed{2.0856165}$

2nd calc 6 $\frac{dy}{dx}$ typed 2 for x and <enter>

GROUP NAME: Durvish

Date:__________

Independant Variable (x-axis):__________

Dependant Variable (y-axis): __________

Student Names (First and Last)

Speaker/Presenter: __________

Writer/Prep:__________

Leader/Collaborator:__________

Conclusion (in words):

E1 #3 & #4

Supporting Work:

3. $\lim_{x \to 2} 6x+7$

$6(2)+7$

$12+7$

19

part 2

$\lim_{x \to 2} 6x+7 = 19$

$|6x+7-19| < \varepsilon$

$|6x-12| < \varepsilon$

$6|x-2| < \varepsilon$

$|x-2| < \varepsilon/6$

$\varepsilon/6 = \delta$

4. $\lim_{x \to 2} \frac{x^2-5x+6}{x^2-4}$

$\frac{(x-3)\cancel{(x-2)}}{(x+2)\cancel{(x-2)}}$

$\frac{x-3}{x+2}$

$\frac{(2)-3}{(2)+2}$

$\frac{-1}{4}$

GROUP NAME: Michael Vobick

Date:__________

Student Names (First and Last)

Speaker/Presenter: __________

Writer/Prep: __________

Leader/Collaborator: __________

Independant Variable (x-axis): __________

Dependant Variable (y-axis): __________

Conclusion (in words):

Exam 1 # 5 & 6

$$\frac{\cancel{(x-2)}(x-3)}{\cancel{(x-2)}(x+2)}$$

Supporting Work:

$$f(x) = \frac{x^2-5x+6}{x^2-4}$$

- When is function continuous
- Removable ~~Discontinuous~~ Removably Discontinuous at $x=2$
- Graph

$x^2-4 \neq 0$

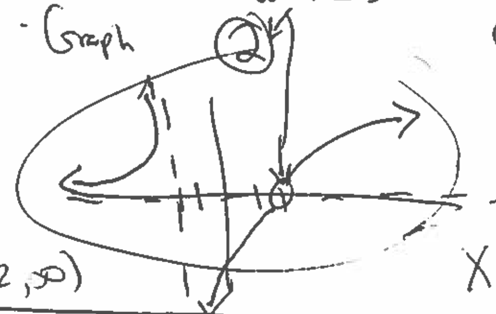
$x^2-4=0$

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

$x \neq 2,-2$

$\mathbb{R} \neq 2,-2$

$(-\infty,-2) \cup (-2,2) \cup (2,\infty)$



$x \neq -2, 2$

Evaluate $\lim_{x \to 0} \frac{\sin(x)}{x}$ by finding the values of $f(x) = \frac{\sin(x)}{x}$ at $x = .1, .01, .001$

$\sin(.1)/(.1)$

$$\frac{\sin(.1)}{(.1)} = .9983341$$

$$\frac{\sin(.01)}{(.01)} = .9999833$$

$$\frac{\sin(.001)}{(.001)} = .9999998$$

Answer 1

$$\lim_{x \to 0} \frac{\cos(x)}{1} = 1$$

GROUP NAME: Date:__________	Student Names (First and Last) Speaker/Presenter: Kerc
Independant Variable (x-axis):__________ Dependant Variable (y-axis): __________	Writer/Prep:__________ Leader/Collaborator:__________

Conclusion (in words):

E1 #7

Supporting Work:

$$f(x) = 2x^2 + 5x - 120$$

$$f(x+h) - f(x) = 2(x+h)^2 + 5(x+h) - 120 - (2x^2 + 5x - 120)$$

$$= 2(x^2 + 2xh + 2h^2) + 5x + 5h - 120 - 2x^2 - 5x + 120$$

$$= \cancel{2x^2} + 4xh + \cancel{5x} + 5h - \cancel{120} - \cancel{2x^2} - \cancel{5x} + \cancel{120}$$

$$\lim_{h \to 0} \frac{4xh + 5h + 2h^2}{h} = \lim_{h \to 0} \frac{\cancel{h}(4x + 5 + 2h)}{\cancel{h}} = \boxed{4x + 5}$$

GROUP NAME:

Date: 4/3/14

Student Names (First and Last)

Speaker/Presenter:

Writer/Prep: Jenn

Leader/Collaborator:

Independant Variable (x-axis):

Dependant Variable (y-axis):

Conclusion (in words):

E1 #8

Supporting Work:

$P(t) = t(5-t)+7$

~~averagte~~ average speed of ball between $t=0$ & $t=5$

$$\frac{P(5)-P(0)}{5-0}$$

$$= \frac{5(5)-(5)^{\wedge}2+7-(5(0)-0^{\wedge}2+7)}{5-0}$$

$$= \frac{7-7}{5-0} = \frac{0}{5} = 0$$

instantaneous speed @ $t=2$

$P(t) = 5t - t^2 + 7$

$P'(t) = 5 - 2t$

$P'(2) = 5 - 2(2)$

$P'(2) = 1$

GROUP NAME:

Date:____________

Student Names (First and Last)

Speaker/Presenter: ____________

Writer/Prep:____________

Leader/Collaborator:____________

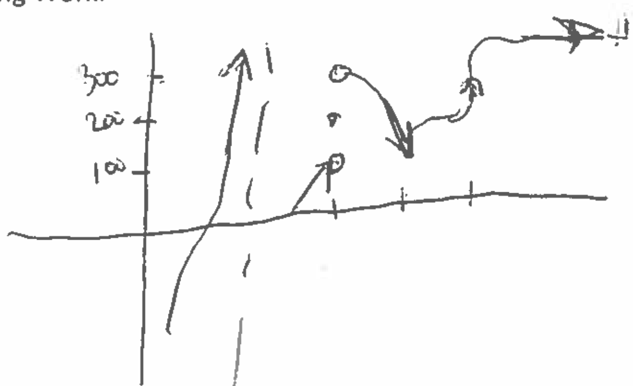
Independant Variable (x-axis):____________

Dependant Variable (y-axis): ____________

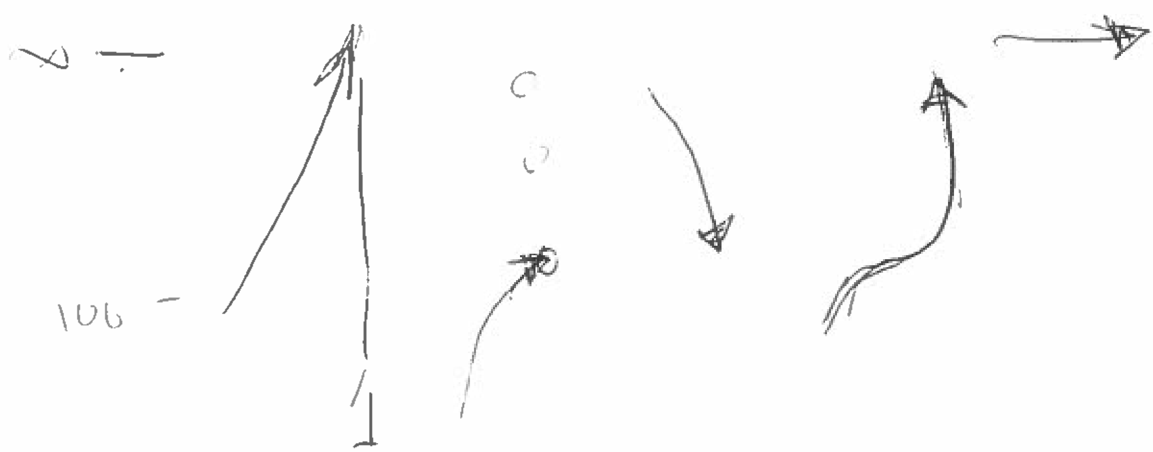
Conclusion (in words):

E1 #9

Supporting Work:



$a=$	1	2	3	4	∞
$\lim_{x\to a} f(x)$	∞	100	100	200	300



GROUP NAME: Dallen

Date:__________

Student Names (First and Last)

Speaker/Presenter: __________

Writer/Prep:__________

Leader/Collaborator:__________

Independant Variable (x-axis):__________

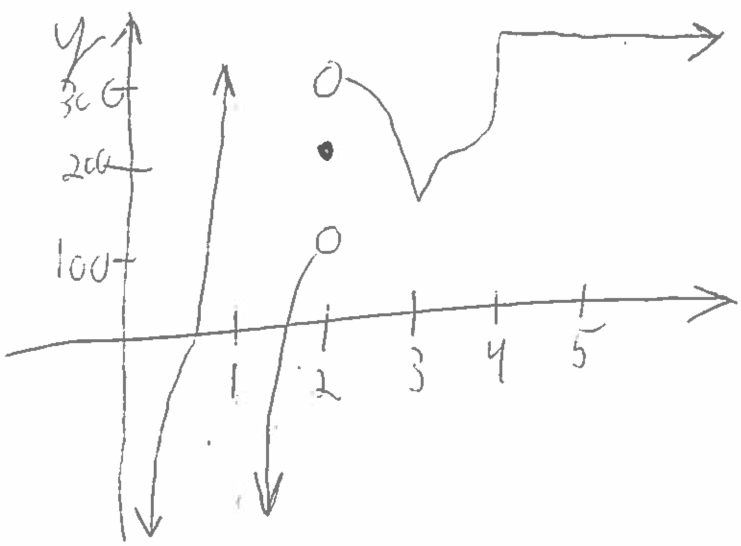
Dependant Variable (y-axis): __________

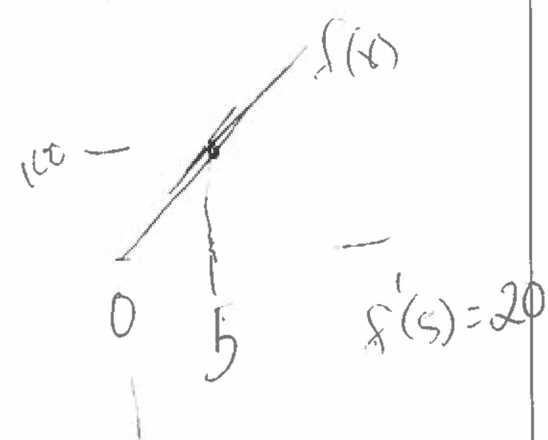
Conclusion (in words):

Ex #10

Supporting Work:

10.





x	1	2	3	4	∞
f(x)	DNE	DNE	DNE	300	0

NOT CONTINUOUS

Corner

or cusp DNE

Flat

GROUP NAME:

Date:____________

Independant Variable (x-axis):______________________

Dependant Variable (y-axis): ______________________

Student Names (First and Last)

Speaker/Presenter: ______________________

Writer/Prep: Jason

Leader/Collaborator:______________________

Conclusion (in words):

E1 #11

Supporting Work:

$f(x) = \sqrt[3]{x} + \cancel{\cos(2\pi/2)}$ constat

$\frac{d}{dx}(x^{\frac{1}{3}}) - \cancel{\sin(2\pi)}$

$\frac{1}{3}x^{-2/3}$

$y = x^{1/3}$

$y' = \frac{1}{3}x^{-2/3}$

$y = 3x^2 + 7x - 2$

$y' = 6x + 7$

$y'(0) = 6(0) + 7$

$y'(0) = 7$

GROUP NAME: Date:__________	Student Names (First and Last) Ahmed I Speaker/Presenter: __________
Independant Variable (x-axis):__________ Dependant Variable (y-axis): __________	Writer/Prep:__________ Leader/Collaborator:__________

Conclusion (in words):

E1 #12

Supporting Work:

Given the function, Find A so that the function is Continuous?

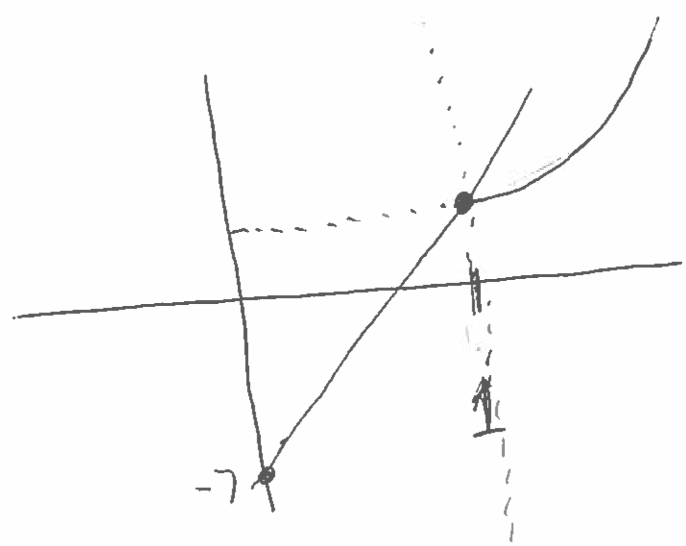
$$f(x) = \begin{cases} Ax-7 & x<1 \\ x^2+2x & x \geq 1 \end{cases}$$

$\lim_{x \to 1^+}$ $(1)^2 + 2(1) = 3$

$A - 7 = 3$

$A = 10$

$\lim_{x \to 1^-}$ $A(1) - 7 = A - 7$



GROUP NAME:

Date:__________

Student Names (First and Last) Jungyu Lim

Speaker/Presenter: __________

Writer/Prep: __________

Leader/Collaborator: __________

Independant Variable (x-axis): __________

Dependant Variable (y-axis): __________

Conclusion (in words):

E1 #13

Supporting Work:

a. $\lim_{x\to\infty}\left(\frac{3x^3-5x+6}{5x^{4000}-9}\right) * \left(\frac{\frac{1}{x^3}}{\frac{1}{x^3}}\right) = \lim_{x\to\infty}\frac{3-\cancel{\frac{5}{x^2}}^{0}+\cancel{\frac{9}{x^3}}^{0}}{5x^{3997}-\cancel{\frac{9}{x^3}}^{0}} = \underline{0}$

b. $\lim_{x\to\infty}\left(\frac{3x^{200}-5x+6}{4x^{200}-9}\right) * \left(\frac{\frac{1}{x^{200}}}{\frac{1}{x^{200}}}\right) = \lim_{x\to\infty}\frac{3-\cancel{\frac{5}{x^{199}}}^{0}+\cancel{\frac{9}{x^{200}}}^{0}}{4-\cancel{\frac{9}{x^{200}}}^{0}} = \underline{\frac{3}{4}}$

c. $\lim_{x\to\infty}\frac{3x^{2001}-5x+6}{5x^{200}-9} * \left(\frac{\frac{1}{x^{200}}}{\frac{1}{x^{200}}}\right) = \lim_{x\to\infty}\frac{3x^{1801}-\cancel{\frac{5}{x^{199}}}^{0}+\cancel{\frac{9}{x^{200}}}^{0}}{5-\cancel{\frac{9}{x^{200}}}^{0}} = \underline{\infty}$