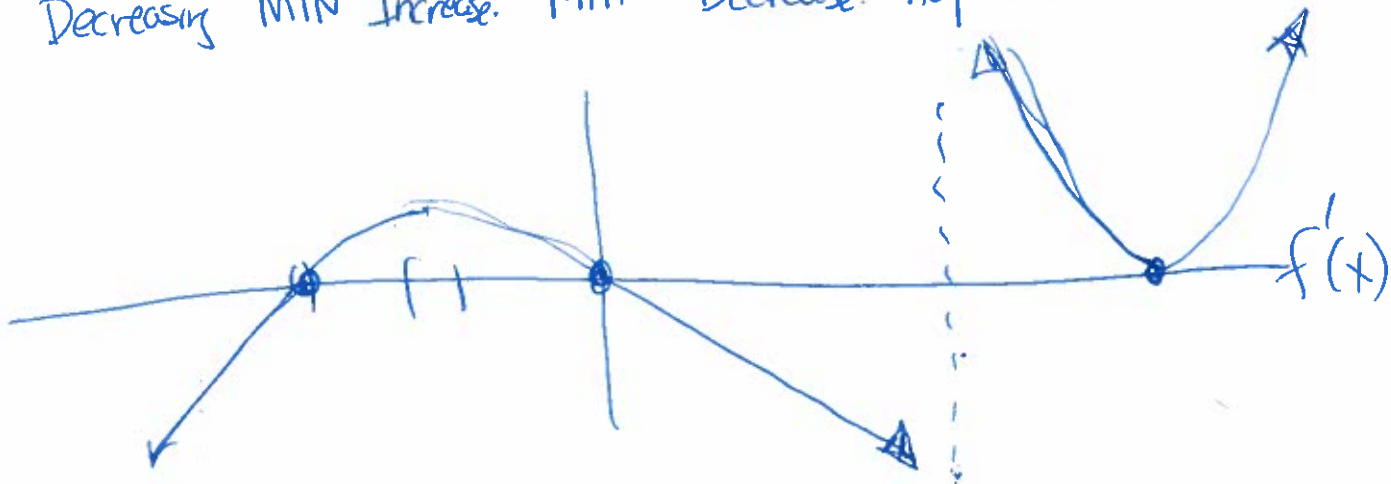
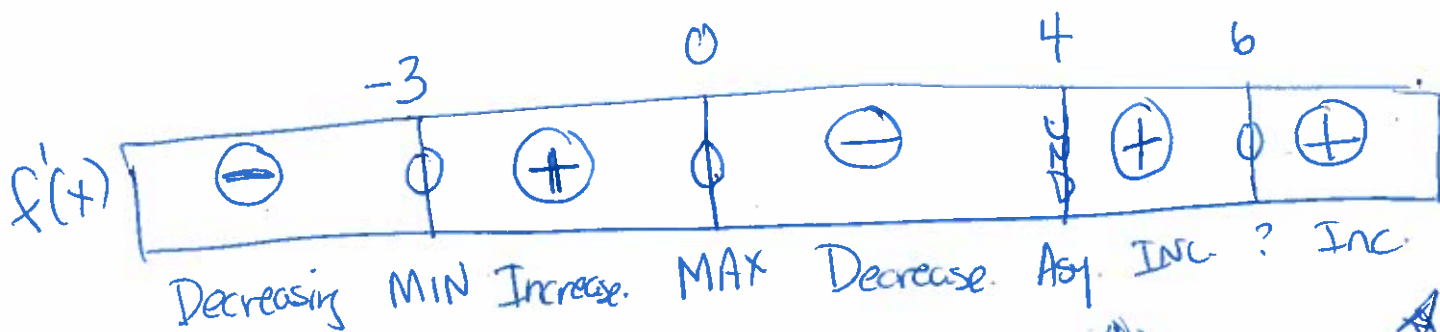
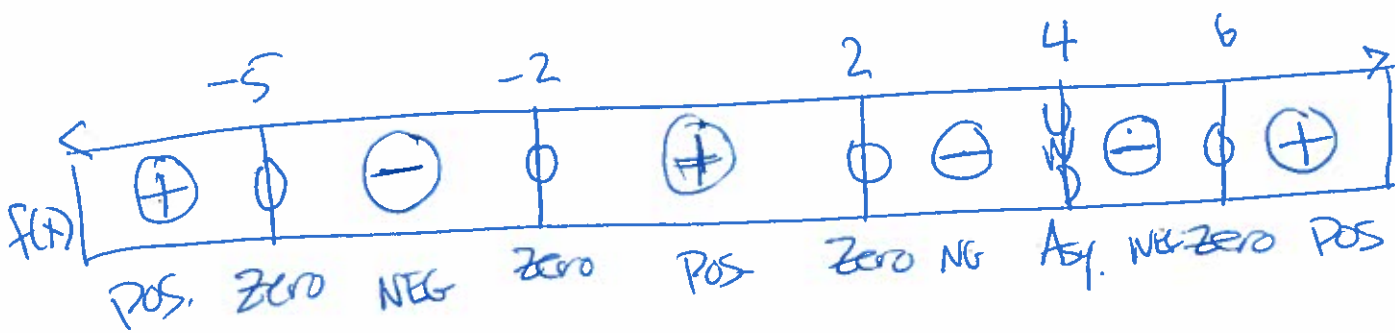
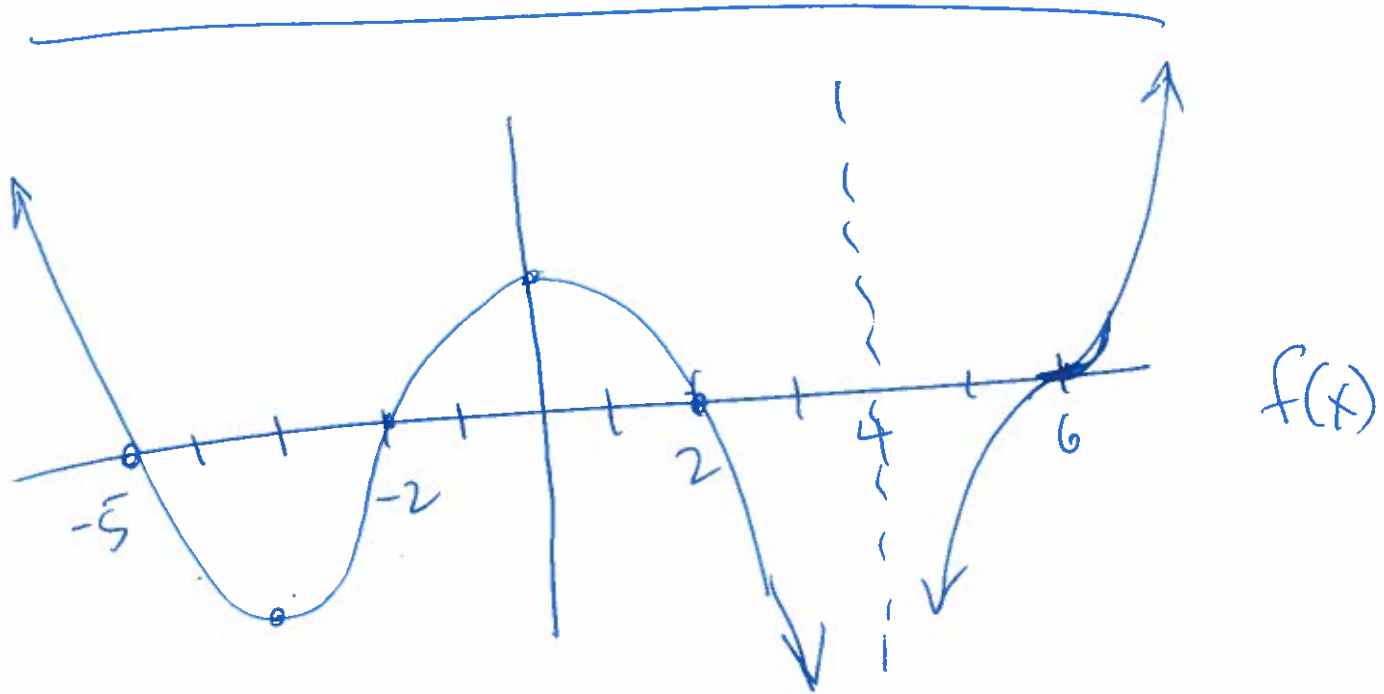
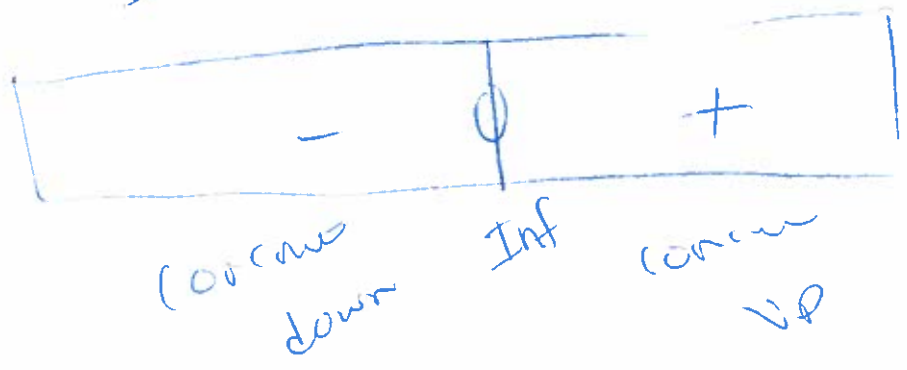
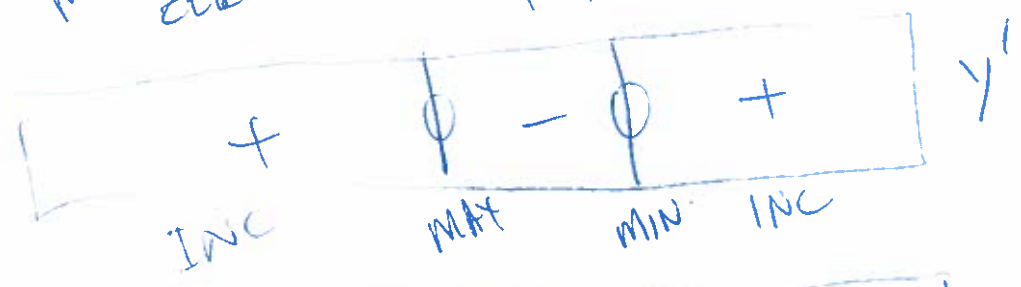
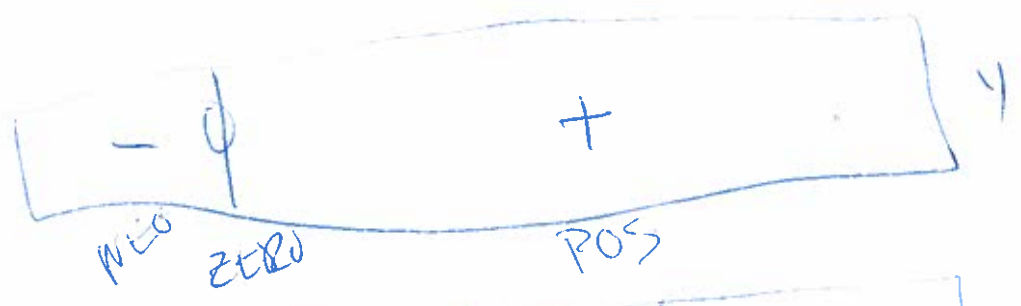
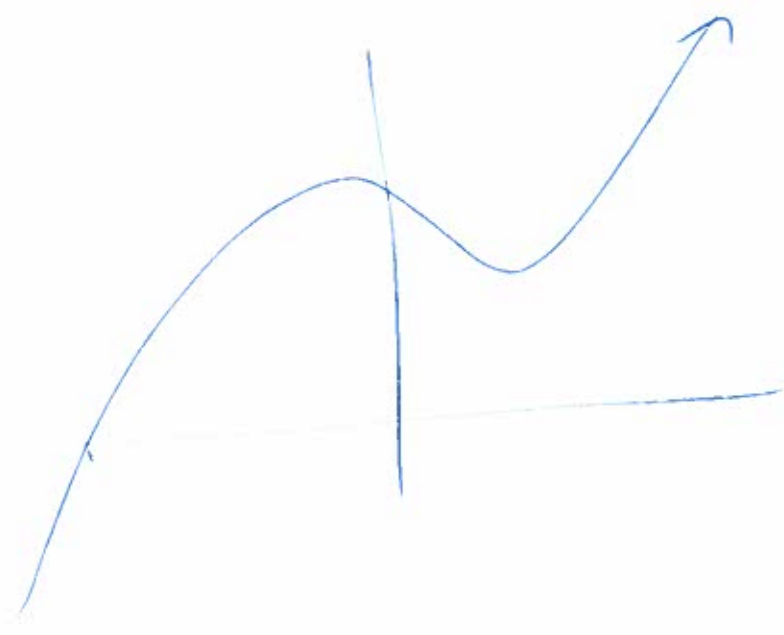


# Analysis of Functions

15/1 m.  
dl 8  
J14



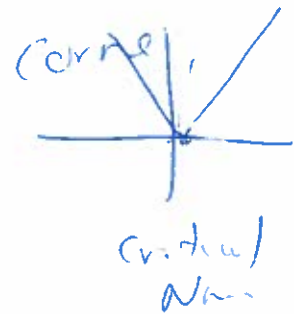
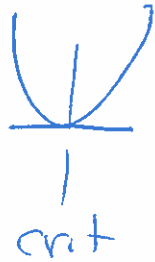


$f_1 = \text{funct}$   
 $f_2 = -f_1'$   
 $f_3 = -f_1''$

# Critical Numbers

are when

$$\underline{y' = 0} \text{ or } \underline{\text{undefined}}$$



---

## Second Derivative Test

Let  $x_1, x_2, x_3$  be critical #'s

$$y''(x_1) < 0$$

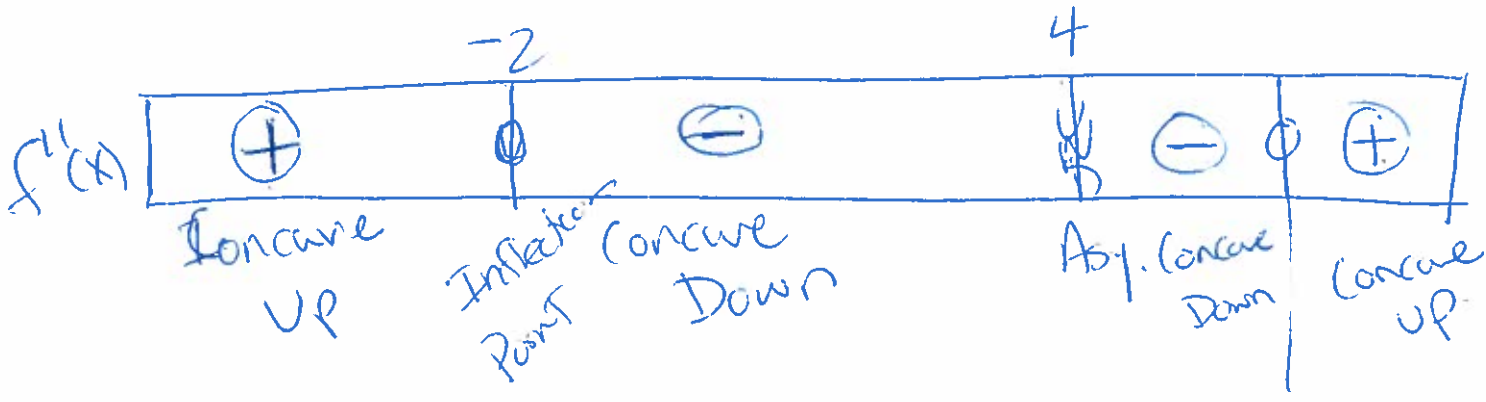
concave down = MAX

$$y''(x_1) > 0$$

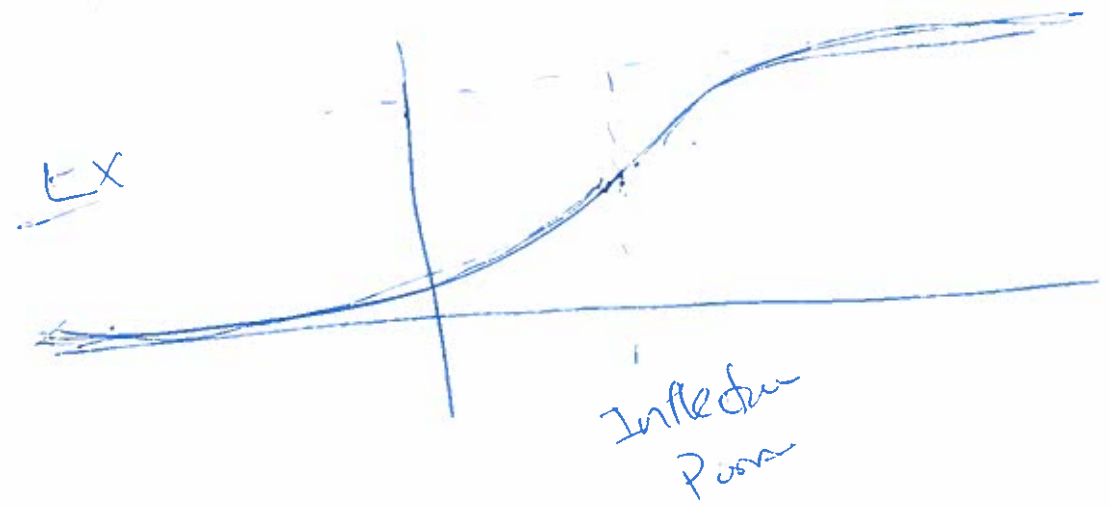
up = MIN

$$y''(x_1) = 0 \text{ or unD}$$

inconclusive



Inflection Point



Today

Find an analysis of your cubic or quartic regression

← zeros  $y, y', y''$



GROUP NAME: (BEST FRIENDS) - (ILLUOT)

Date: 3-24-2014



Student Names (First and Last)

Speaker/Presenter: VIHLE, A.H.

Independent Variable (x-axis): YEAR

Writer/Prep: LAUREN DORR

Dependant Variable (y-axis): NUMBER OF AREAS

Leader/Collaborator: \_\_\_\_\_

Conclusion (in words):

Supporting Work:

$$y_1 = ax^3 + bx^2 + cx + d$$

$$y_2 = 3ax^2 + 2bx + c$$

$$y_3 = \text{NDERIV}(y_1, x, x)$$

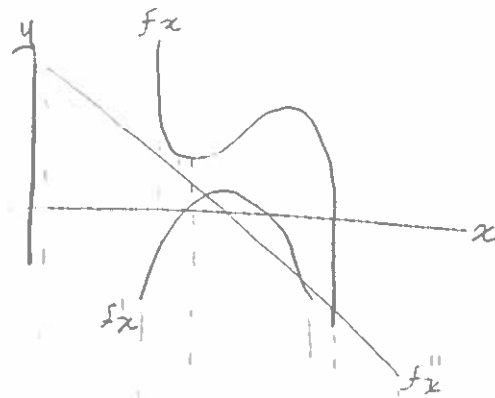
LB = 2009.2128      LB = 2015.2979

RB = 2010.9894      RB = 2015.3404

F'(x) ZEROS    x = 2009.8174    x = 2014.1871

F''(x) ZEROS    x = 2012.0022

F(x) ZEROS    x = 2016.2531



f(x)	+	+	+	-
f'(x)	-	+	-	
f''(x)	+			-

GROUP NAME: <u>Jody highrollers</u>	Student Names (First and Last)
Date: <u>3/24/14</u>	Speaker/Presenter: <u>Ryan Motrawski</u>
Independent Variable (x-axis): <u>years</u>	Writer/Prep: <u>Bishop Bor</u>
Dependant Variable (y-axis): <u>gas prices</u>	Leader/Collaborator: <u>Trampus et al</u>

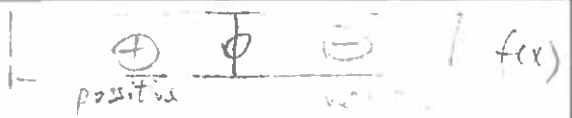
Conclusion (in words): Till to 2006 gas price was positive to negative although it will not be real. After 2002 price was first increasing to decreasing. 2023 (concave down & decreasing at  $f'(x) = -3.89$   $f(x) = 6.05$ )

Supporting Work:

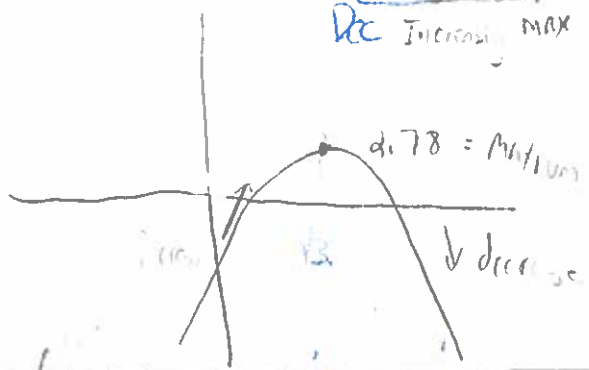
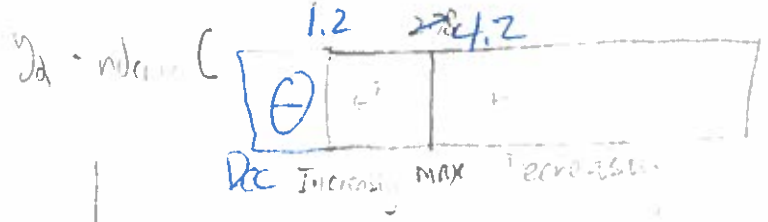
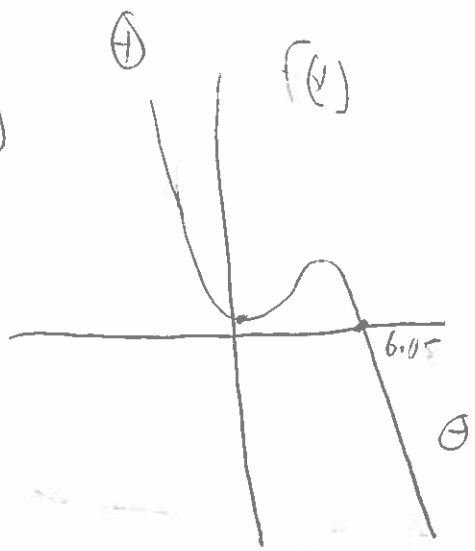
2001	= 1
2002	= 2
2003	= 3
2004	= 4
2005	= 5

Wolfe regression

$y_1 = \text{cubic}$   
 $y_2 = (y_1, x, t)$

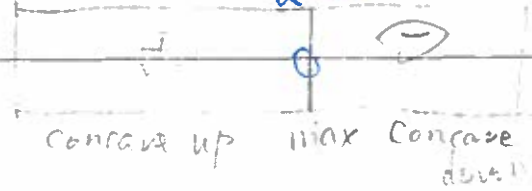


$y = ax^3$   
 $y' = 3ax^2$   
 $y'' = 6ax$



$\text{Max}_x = x = 13.7$   
 $y = 2.7$   
 $2^2.78$

2014  $\rightarrow$



GROUP NAME: Money Makers

Student Names (First and Last)

Date: 03/24/2014

Speaker/Presenter: Bryna S.

Independent Variable (x-axis): time (years)

Writer/Prep: Edna O.

Dependant Variable (y-axis): Percentage (crime rate)

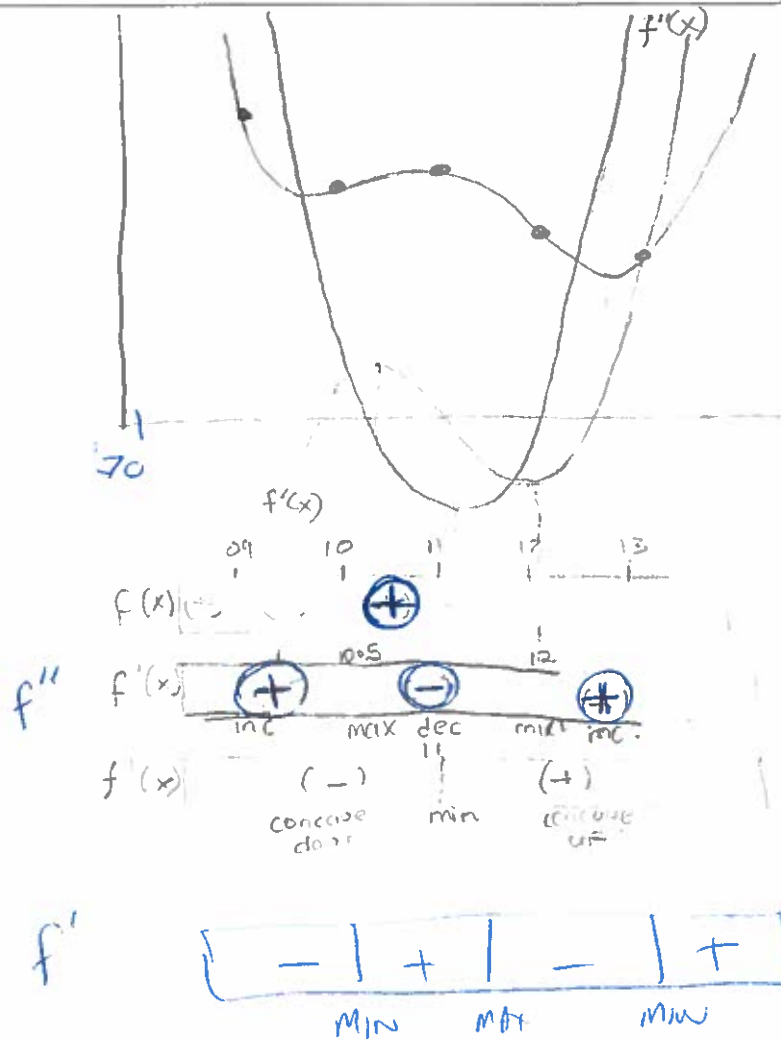
Leader/Collaborator: Monica K.

Conclusion (in words):

In 1970, the crime rate

Supporting Work:

Year	Percentage
1970	.75
1980	.52
2011	.31
2012	.14
2013	.39



$$y = ax^4$$

$$y' = 4ax^3$$

$$y'' = 12ax^2$$

GROUP NAME: Functional Paradigm

Date: 03/24/2014

Student Names (First and Last)

Speaker/Presenter: Nader Shenouda

Independent Variable (x-axis): hours (time)

Writer/Prep: Karol Zanski

Dependent Variable (y-axis): MB memory usage

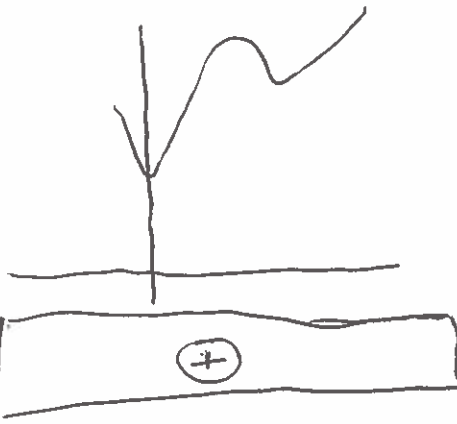
Leader/Collaborator: \_\_\_\_\_

Conclusion (in words):

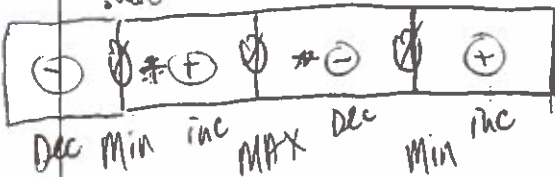
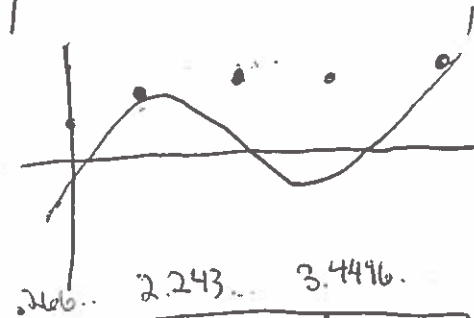
@ 1 hour the memory used will be 1500 MB, it will be increasing at 1341.7 MB/hour and it is increasing out of control.

Supporting Work:

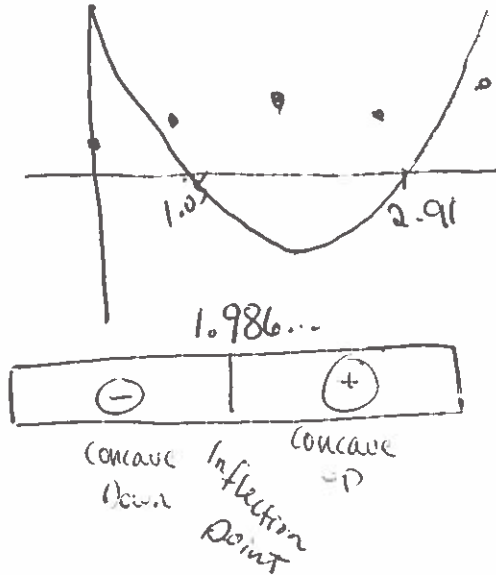
$f(x)$  Quart Reg



$f'(x)$



$f''(x)$



At  $t = 1$  hour.

$y_0 = 1500$

$y' = 1341.7$

$y'' = 200$





GROUP NAME:

70katz Beatz

Student Names (First and Last)

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

Speaker/Presenter: Kausalya Mannum

Independent Variable (x-axis): years

Writer/Prep: Amelia Pfeila

Dependant Variable (y-axis): deaths in the world  
*AIDS*

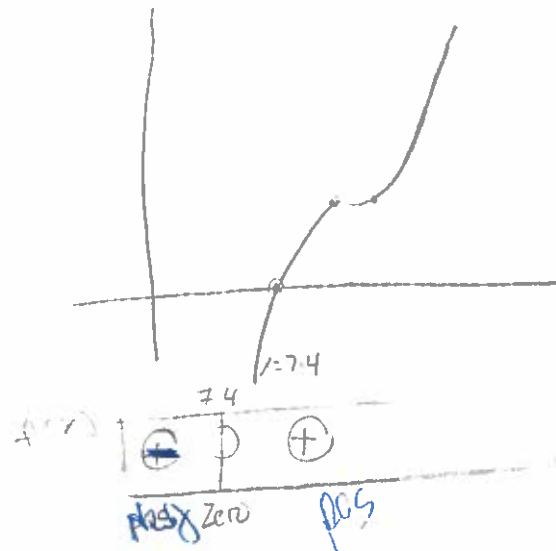
Leader/Collaborator: Fredrick

Conclusion (in words):

In 2015 people are dying of AIDS, the deaths rate is increasing, growing out of control.

Supporting Work:

X	Y
2009	2.1
2010	2.3
2011	2.6
2012	2.4
2013	2.7



$f'(x)$	7.4	12.4
+	$\phi$	-
INC	MAX	DEC

$f''(x)$	11.21	
-	$\phi$	+
concave down	INF	concave up

All three



$y_1 = \text{cubic}$   
 $y_2 = \text{rational}(y_1, x, x)$   
 $y_3 = \text{rational}(y_2, x, x)$

x	$y_1$	$y_2$	$y_3$
1.5	4.32	1.4452	75