

Review

Transformations of Functions

146
d13

Parent Function Ex $y = \ln(x)$

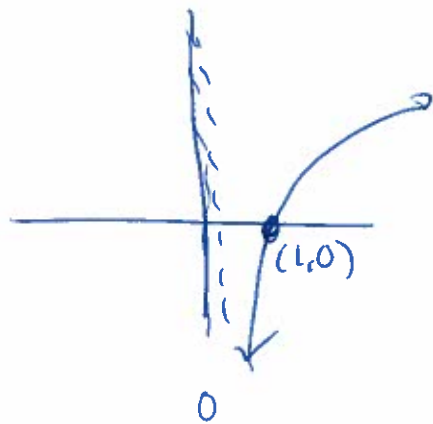
OA side Transforms

ADD

$$f(x) + A$$

Raise / Lower by A

Ex $y = \ln(x) + 2$



OA side Transform

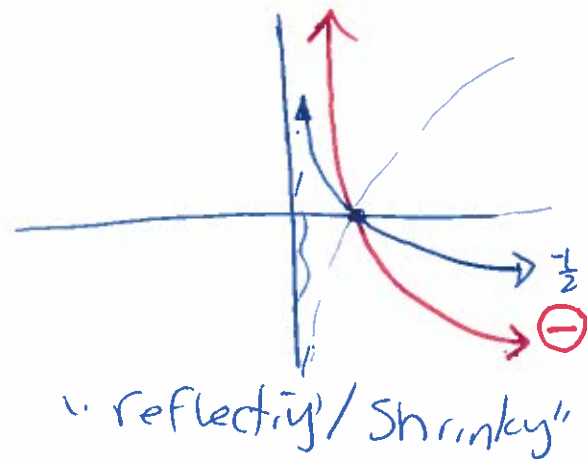
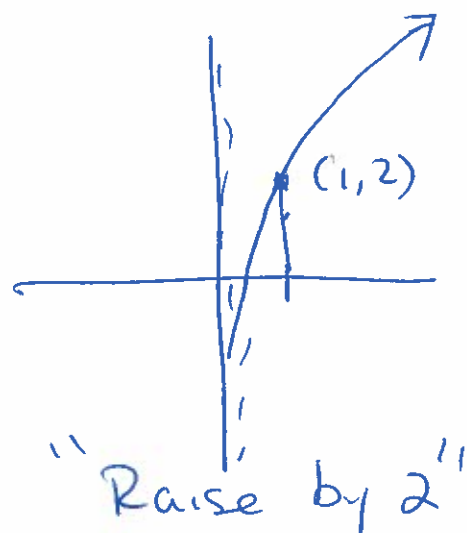
MULTIPLY

$$A f(x)$$

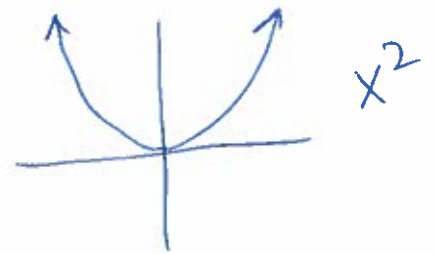
Stretch, Shrink, Reflect

$$A > 1 \quad 0 < A < 1 \quad A < 0$$

Ex $y = -\frac{1}{2} \ln(x)$



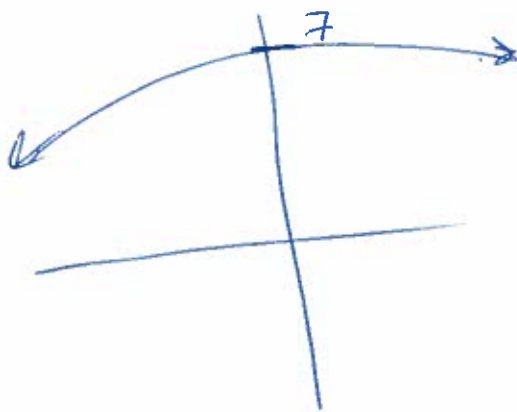
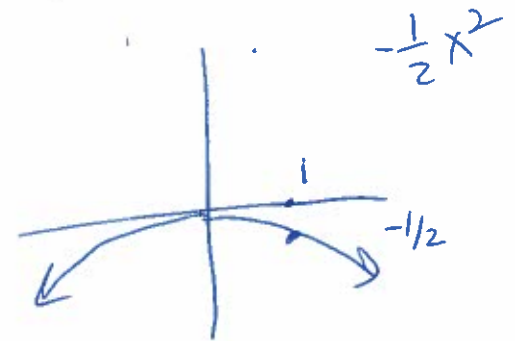
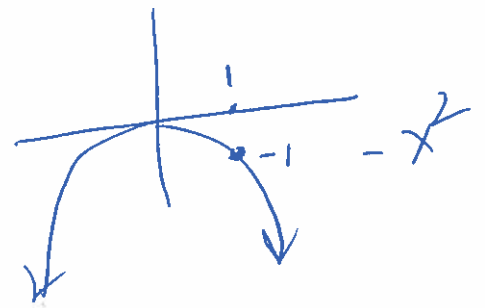
Ex $y = -\frac{1}{2}x^2 + 7$



Parent: x^2

Order

1. Reflect.
2. Shrink by $\frac{1}{2}$
3. Raise by 7



Inside Transformation

$f(x + A)$

Shifts Left or Right by $-A$

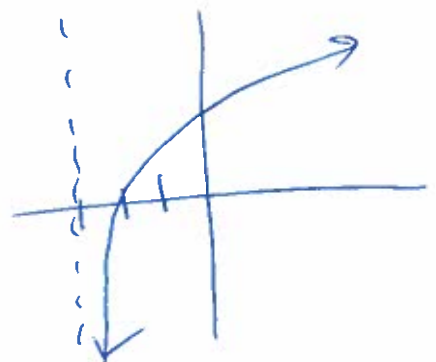
Add.

Ex $y = \ln(x + 3)$

Domain: $x + 3 > 0$

$x > -3$

V.A: $x = -3$



Inside Transformation

(Multiply)

$$f(Ax)$$

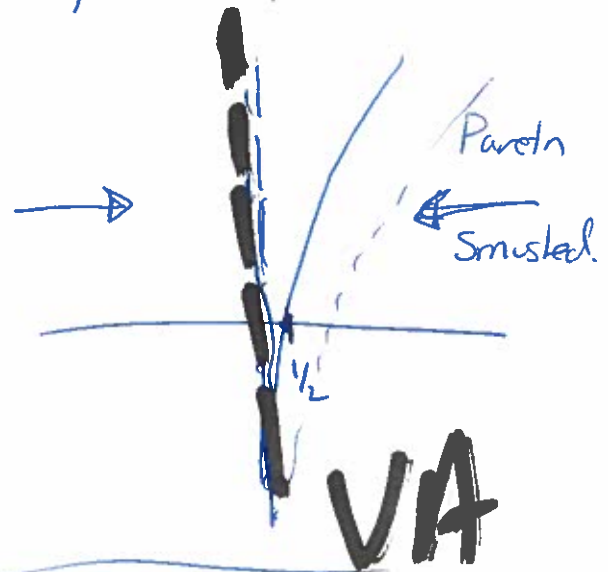
Stretch / Pull / Reflect about y-axis

$$A > 1$$

$$0 < A < 1$$

$$A < 0$$

Ex $y = \ln(2x)$



Ex $y = -\frac{1}{2}e^{x+3} - 7$

Parent: $y = e^x$



1. +3 moves Left by 3.



2. = reflects.



3. 1/2 Shrink by 1/2



4. -7 down 7



Change of Base in Calculator

$$\text{If } y = \log_7(x)$$

$$y_1 = \log(x) / \log(7)$$

or

$$y_1 = \ln(x) / \ln(7)$$

or

$$y_1 = \log_{70}(x) / \log_{70}(7)$$

$$y = \log_4(x+3) - 1$$

$$y_1 = \log(\underline{x+3}) / \log(4) - 1$$

Find VA: $x+3=0$
 $x=-3$



(1, 0) 1,
(-2, -1) -2,
(13, 1)



$$\log(8) / \log(4)$$

Algebra

$$\log 2^3 / \log 2^2$$

P3 - Ladder Prop

$$3 \log(2) / 2 \log(2)$$

$$\frac{3 \cancel{\log 2}}{2 \cancel{\log 2}} = \frac{3}{2} \text{ Algebra}$$

$$4 \log_2 \left(\frac{1}{4} \right)$$

P4 Change of Base

$$4 \log(1/4) / \log(2) = -8$$

$$4 \log(2)^{-2} / \log(2)$$

P3 Ladder

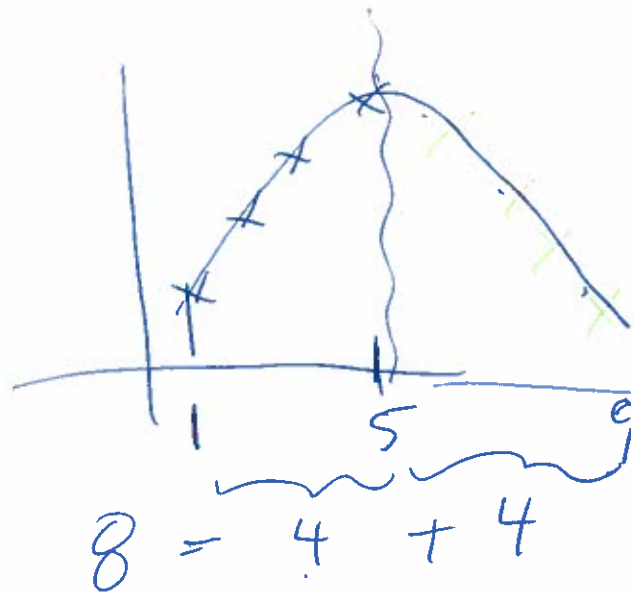
$$4 * -2 \cdot \cancel{\log 2} / \cancel{\log 2}$$

Algebra

-8

Sine Regression

STAT → CALC C: Sinreg



Sinreg $\frac{4}{1}$, $\frac{L_1}{2}$, $\frac{L_2}{2}$, $\frac{8}{1}$

↑ ↑ ↑
Iteration Period Period

$\frac{4}{1}$ $\frac{L_1}{2}$ $\frac{L_2}{2}$ $\frac{8}{1}$

 ↑ ↑
 2nd 1

$Y_1 = \text{VARS } S: > > 1$

Use \bar{y} sine regress.

I predict that

1	10
2	20
3	30
4	40
5	50
6	40
7	30
8	20
9	10
10	20

GROUP NAME: <u>Math 101</u>	Student Names (First and Last) ^C
Date: <u>3/11</u>	Speaker/Presenter: <u>Osman Rehman</u>
Independent Variable (x-axis): <u>T-shirts</u>	Writer/Prep: <u>Joey Stevens / Cibed Bassin</u>
Dependant Variable (y-axis): <u>Sales</u>	Leader/Collaborator: <u>Elija Anpansa</u>

Conclusion (in words):
 The cheaper we sell T-shirts the more we will sell
 For 35 people will buy a T-shirt for \$20

Supporting Work:

Sin reg

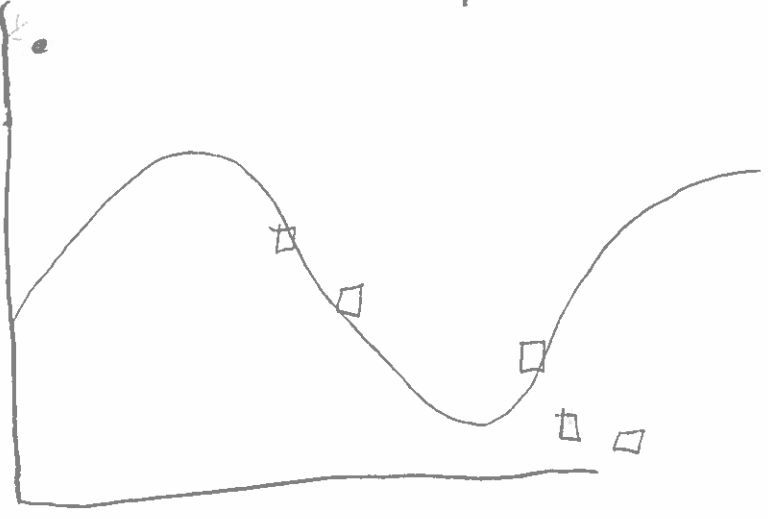
$$y = a * \sin(bx + c) + d$$

- a = 18.90
- b = .0698
- c = .8187
- d = 22.69

L1	L2
20	35
35	20
40	15
55	12
60	10
65	9

$$y = 9 * \sin(bx + c) + d$$

$a = 13.90$
 $b = .0698$
 $c = .8187$
 $d = 22.69$



GROUP NAME: money Bags
 Date: 3/11/14
 Independant Variable (x-axis): month
 Dependant Variable (y-axis): sales of Snickers

Student Names (First and Last)
 Speaker/Presenter: Melissa Scarpati
 Writer/Prep: Angelica Ippolito
 Leader/Collaborator: Kevin Enriquez

Conclusion (in words):
 On MO. 18 (Next June), Snickers will sell ~~477~~ 1169 ... candy bars.

Supporting Work:

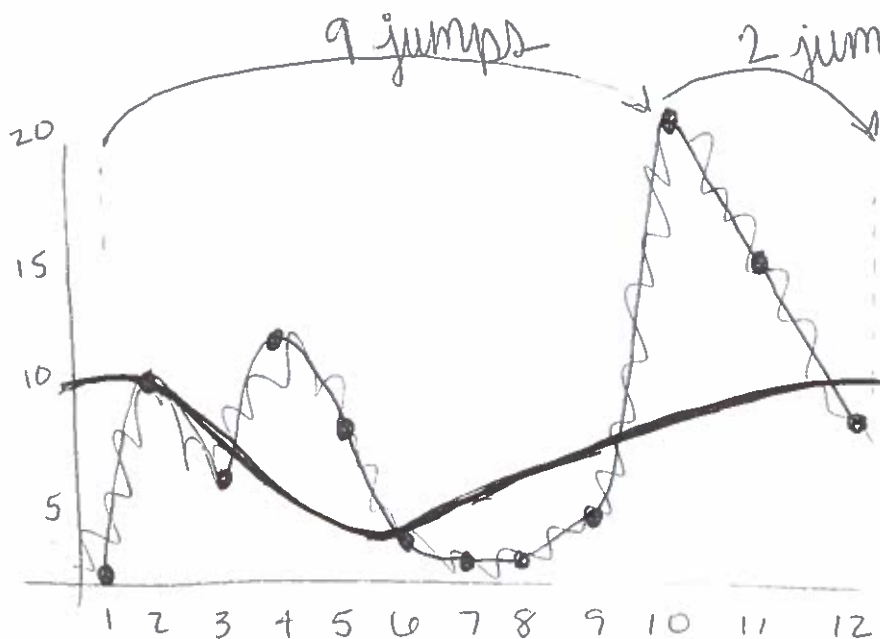
STAT \rightarrow calc C: Sinreg

(Sales in millions)

L1	L2
1	1
2	10
3	6
4	12
5	7
6	4
7	2
8	2
9	5
10	20
11	15
12	8

Sin Reg
~~Y = A sin(B(x - C)) + D~~
 $y = A \sin(bx + c) + d$
 $a = 3.0708...$
 $b = 0.5712...$
 $c = 1.2489...$
 $d = 7.4187...$

Don't do period.
 Just do SinReg.
 Because data already goes up + down.
 Doing a period makes the graph go back down. (forces it).
 period = 11



makes the graph go back down. (forces it).

GROUP NAME: PreCalc Invaders

Date: 3/11/14

Student Names (First and Last)

Speaker/Presenter: Alicia Contino

Writer/Prep: Zolboo Baasarjav

Leader/Collaborator: Dorson Thomas

Independent Variable (x-axis): year

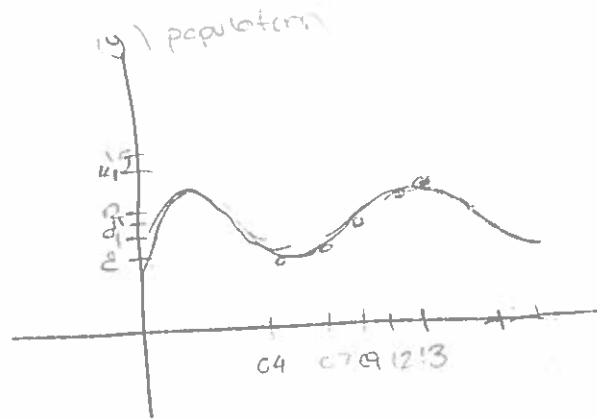
Dependent Variable (y-axis): population in millions

Conclusion (in words):

NYC's population in 2014 will be 14.67 million,

Supporting Work:

L1	L2
2004	8
2007	9
2009	12
2012	14
2013	15



STAT → CALC C: sin reg

sin reg 1, L1, L2, 18

$$y = a * \sin(bx + c) + d$$

$$y = 3.435... * \sin(0.849...x + 2.511...) + 11.341...$$

GROUP NAME: Newbies

Date: 3/11/14

Student Names (First and Last)

Speaker/Presenter: Li-Yang Lin

Independent Variable (x-axis): ~~Price~~ Price

Writer/Prep: Zachary Labbanza

Dependant Variable (y-axis): Revenue

Leader/Collaborator: Khrystyna Pawlyuchyk

Conclusion (in words): At \$3500, revenue will be \$36761.

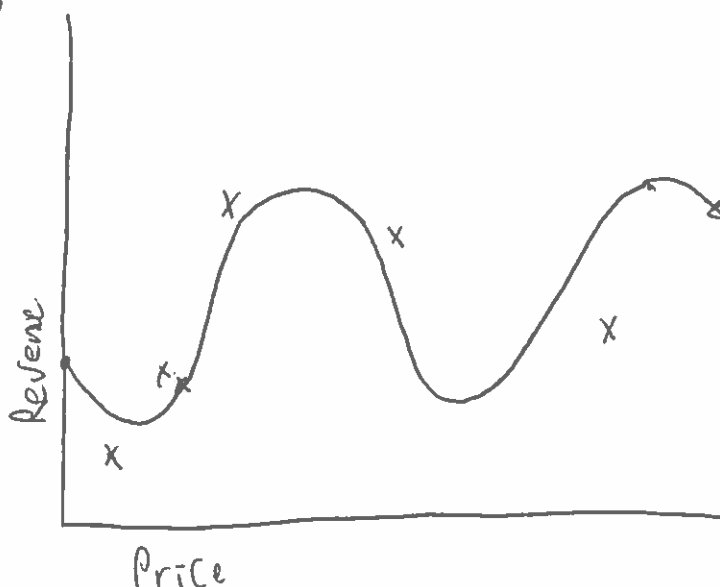
Supporting Work:

Price of Laptop X	Revenue Y
700	7000
900	15000
1000	17000
1250	37500
2000	30000
3000	18000

Sin Regression

$$y = 13451.68 \cdot \sin(.00364x + 1.4502) + 25255.618$$

x = data points



GROUP NAME: Date: <u>11 MAR 11</u>	Student Names (First and Last) Speaker/Presenter: <u>Paul</u>
Independant Variable (x-axis): <u>MPH</u>	Writer/Prep: <u>Ricky</u>
Dependant Variable (y-axis): <u>MPG</u>	Leader/Collaborator: <u>Byron</u>

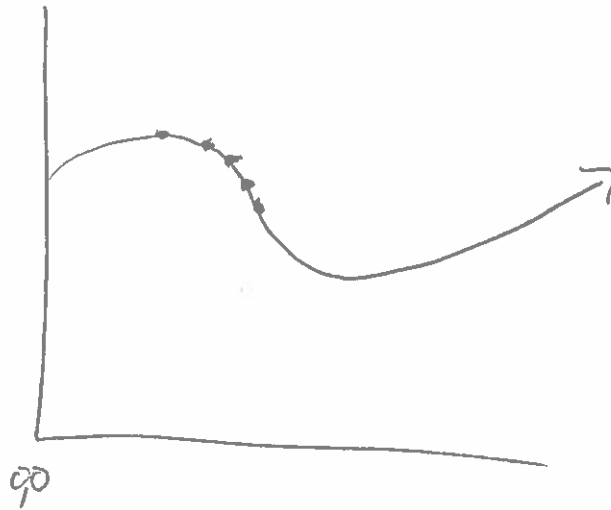
Conclusion (in words): going 100mph, you will get 14.1 mpg

Supporting Work:

L_1	L_2
25	30
45	28
50	25
65	21
70	19

STAT > CALC

Sin Reg



GROUP NAME: We love science

Date: 03-11-14

Student Names (First and Last)

Speaker/Presenter: Marta Truszkowska

Independent Variable (x-axis): Time

Writer/Prep: LOVE KENNEDY

Dependant Variable (y-axis): Cupcakes

Leader/Collaborator: _____

Conclusion (in words): In 60mins we will make 97 cupcakes

Supporting Work:

Sin Reg
 $Y = a \cdot \sin(bx + c) + d$
 $a = 41.263 \dots$
 $b = .0581 \dots$
 $c = -2.796 \dots$
 $d = 70.831 \dots$

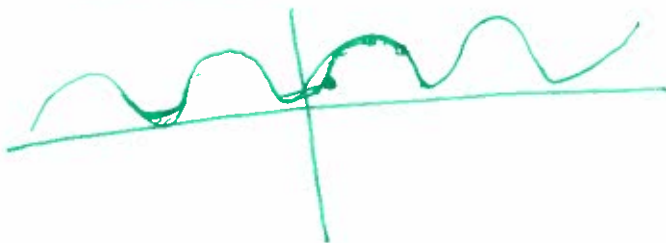
L1(x) Time	Y(Cupcake) ^{L2}
24	24
35	48
47	72
67	96
78	120

STAT \rightarrow CALC : C Sin reg
 Sin reg: 1, L1, L2, 108

$X_1 = \text{VAR} S : \gg$

$$Y_1 = 41.263213971616 * \sin(.05817764173314x + -2.7960466918797) + 70.831497299435$$

G.RAPH



GROUP NAME: Math lover's

Student Names (First and Last)

Date: 3/11/14

Speaker/Presenter: Karthik

Independent Variable (x-axis): cost of watch

Writer/Prep: Karthik

Dependant Variable (y-axis): # of watch's sold

Leader/Collaborator: Nour chenna

Conclusion (in words):
 If we sell watch for \$90, then we will sell 57 watch's

Supporting Work:

X	Y
110	80
120	70
150	65
170	50
180	38
190	25

Line Regression

$$Y = a * \sin(bx + c) + d$$

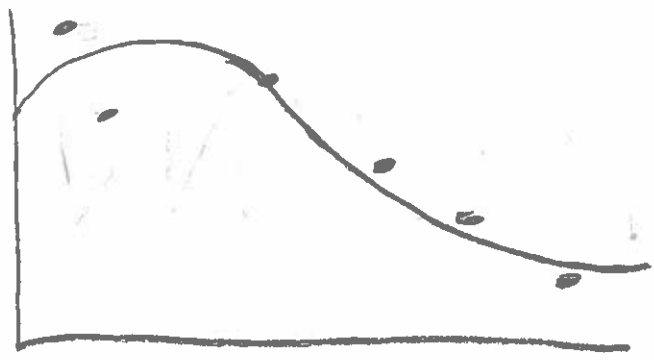
$$a = 26.30$$

$$b = .039$$

$$c = 2.95$$

$$d = 51.34$$

$$Y_1 = 26.30 * \sin(.039X + 2.95) + 51.34$$



Prediction:

X	Y ₁
90	57

GROUP NAME: This Group, Best Group

Date: 3/11/14

Student Names (First and Last)

Speaker/Presenter: Jesse Johnson

Writer/Prep: Billy Rafferty

Leader/Collaborator: _____

Independent Variable (x-axis): Months

Dependent Variable (y-axis): Price of Bitcoins

Conclusion (in words):

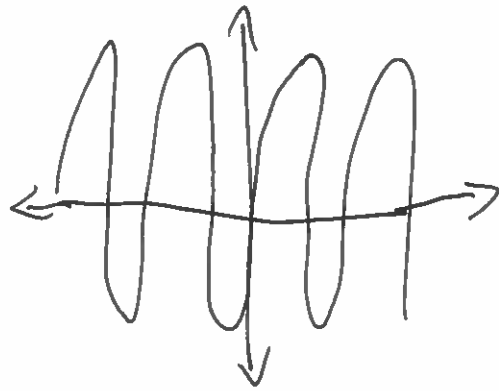
In 2 years the price of Bitcoins will be \$739.82

Supporting Work:

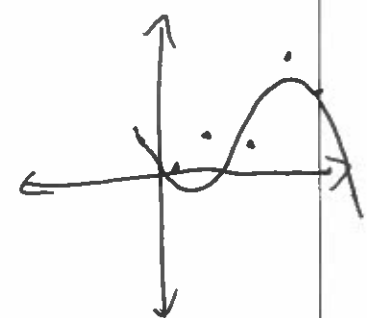
Data

X (months)	Y (Dollars)
1	\$4.90
4	\$308.31
7	\$332.44
10	\$3151.90
13	\$2116.90

Zoomed out



Zoomed in



Sin Reg

$$y = a \cdot \sin(bx + c) + d$$

$$y = 1344.035... \cdot \sin(.413...X - 2.969...) + 1062.638...$$

GROUP NAME: group 3

Date: March 11, 2014

Student Names (First and Last) Infosino

Speaker/Presenter: Benjamin ~~Benjamin~~

Independent Variable (x-axis): height

Writer/Prep: Blake Binko

Dependant Variable (y-axis): weight

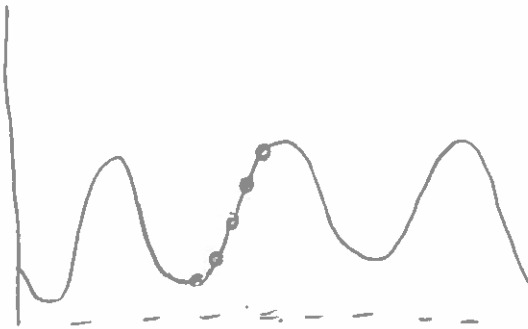
Leader/Collaborator: Kevin Leonard

Conclusion (in words):

if you are 74" tall, you will weigh 207.88 lbs

Supporting Work:

X	y
64	125
65	140
68	140
70	180
72	200



$$y = 41.6548 \cdot \sin(.25x + 1.61) + 167.14$$

$$a = 41.6548$$

$$b = .251327$$

$$c = 1.61298$$

$$d = 167.1372$$