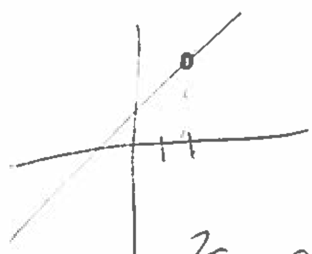
Limits

$$\lim_{x \to a} f(x) = L$$

1. $\lim_{x \to 2} x + 3 = 2 + 3 = 5$

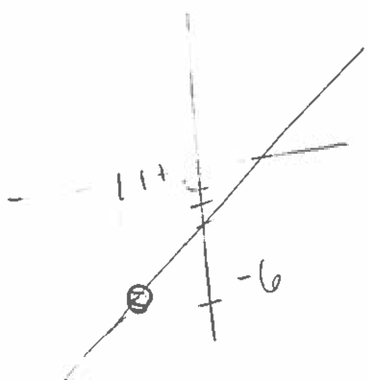


2. $\lim_{x \to -3} \frac{x^2 - 9}{x + 3} = \lim_{x \to -3} \frac{(x+3)(x-3)}{(x+3)}$

$= \lim_{x \to -3} x - 3$

$-3 - 3$

$= -6$



3. Table

		-3		
-5.9	-5.99	ERR	-6.01	-6.1

Data IN — 1. [Stat] 1: EDIT

L1	L2

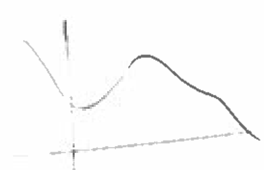
Plotting Data — 2. [Stat Plot]

Zoom 9:

Regressi[on] — 3 [STat] (>) Calc 6: Cubic

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

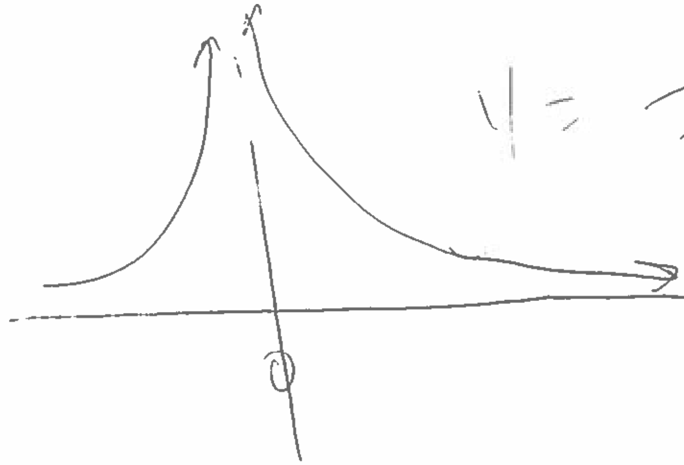
Graph Regress. — 4. [Y=] [VARS] 5: (>)(>) 1: [Graph]



Regression — 3 [STAT] (>) Calc 7: Quart

4. [Y=] (V) VARS 5: (>)(>) 1:

	Cubic	Quart
Evaluate + Predict at x = "100"	___	___

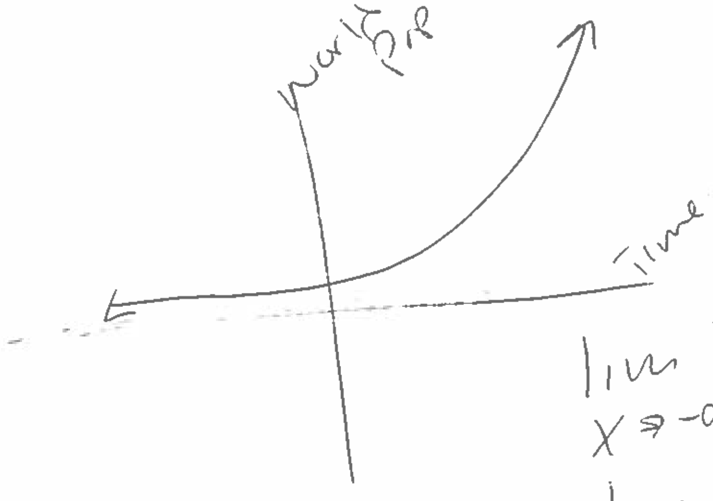


$y = \frac{1}{x^2}$

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

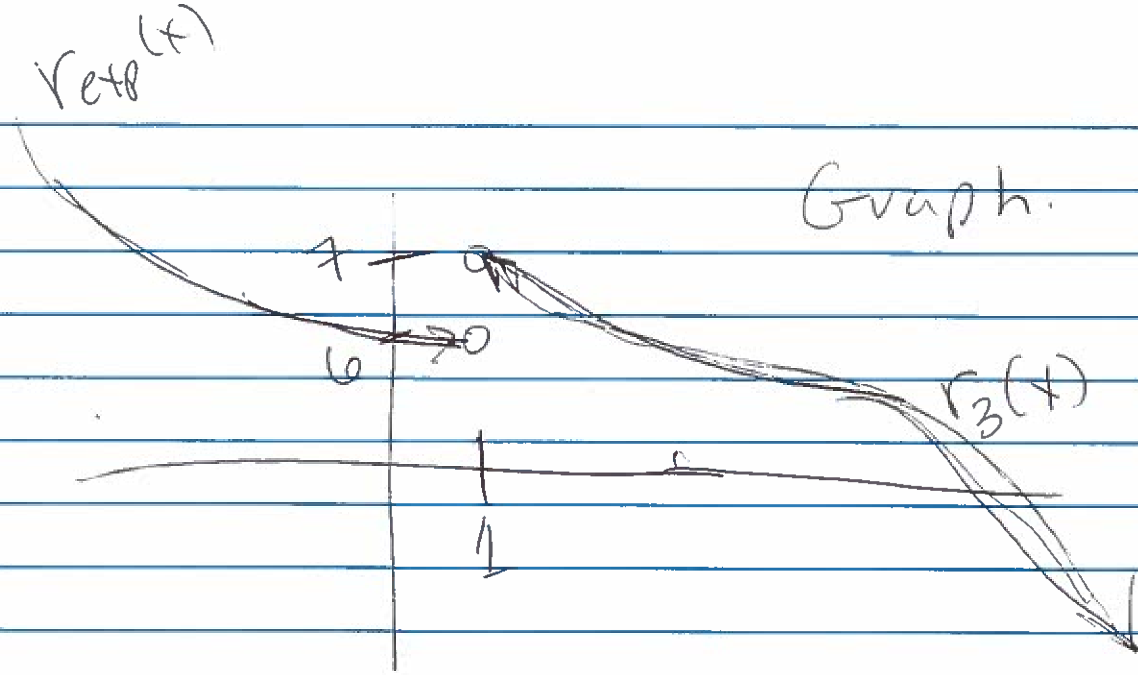
Right End Behavior $\lim_{x \to \infty} \frac{1}{x^2} = 0$

Left End Behavior $\lim_{x \to -\infty} \frac{1}{x^2} = 0$



$\lim_{x \to -\infty} r(x) =$ [illegible]

$\lim_{x \to \infty} r(x) = \infty$



Linear Regress	$r_1(x)$
Quad regress	$r_2(x)$
Exponent	$r_{exp}(x)$
ln	$r_{ln}(x)$

$$\lim_{x \to \infty} r_3(x) = -\infty$$

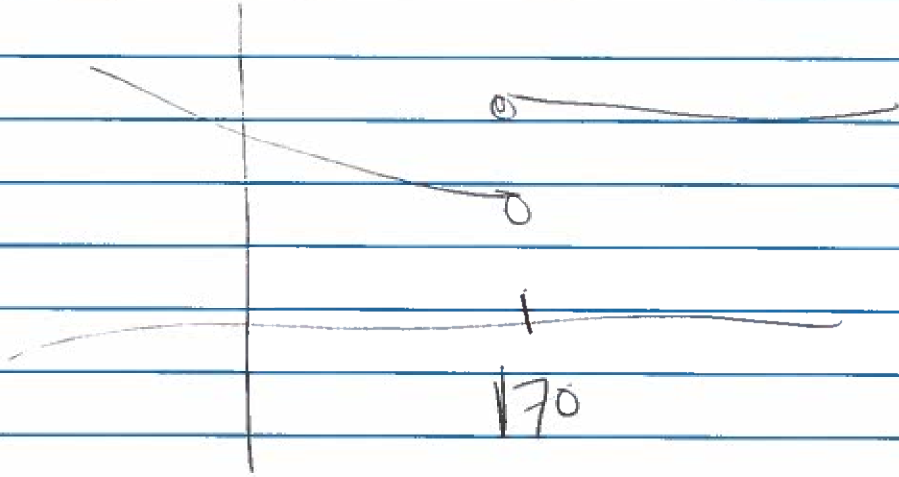
$$\lim_{x \to -\infty} r_{exp}(x) = \infty$$

$$\lim_{x \to 1^+} r_3(x) = 7$$

Approach from Right →

$$\lim_{x \to 1^-} r_{exp}(x) = 6$$

left →



X	Y_1	Y_2
170	2.5	3.5

$$\lim_{x \to 170^-} r(x) = 2.5$$

$$\lim_{x \to 170^+} r(x) = 3.5$$

$$\lim_{x \to \infty} r(x) = \infty$$

$$\lim_{x \to -\infty} r(x) = \infty$$

GROUP NAME: El Business

Date: 1/30/14

Independant Variable (x-axis): World Cups

Dependant Variable (y-axis): Goals Scored

Student Names (First and Last)

Speaker/Presenter: Ryan

Writer/Prep: Andy

Leader/Collaborator: Brittany Bays

Conclusion (in words):
If from before the World Cup began year 3 was predicted it would be 38.25 goals. If you were from the future you would expect year 3's W.C. to have 37.171 goals.

Supporting Work:

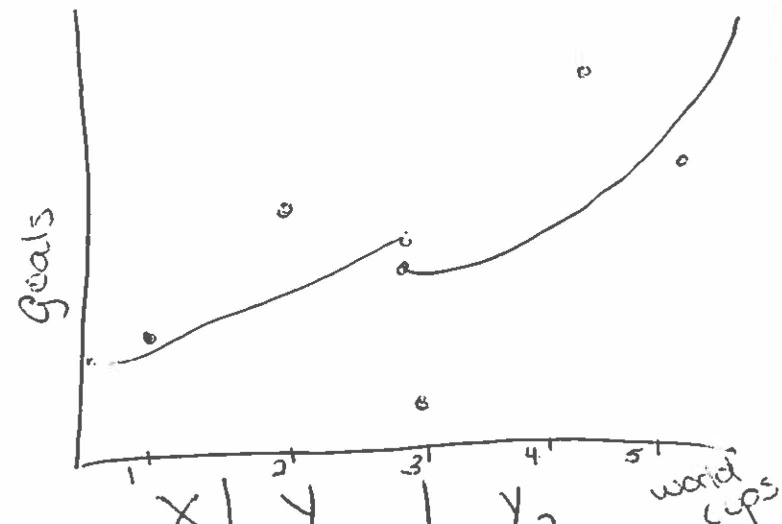
[Y=] [STAT] [>] ∅ (Exp)

[÷] [(] [X] [2nd] [MATH] [≤] 3) (6)

[V] Y_2 [STAT] [>] 6 (quad)

[÷] [(] [X] [2nd] [MATH] [≥] 3) (4)

[GRAPH]



X	Y_1	Y_2
3.1	Error	37.399
3	38.25	37.171
2.9	38.039	Error

[2nd] [GRAPH] 3.1 [ENTER]
3 [ENTER]
2.9 [ENTER]

$\lim_{x \to 3^-} y_{ex}(x) = 38.25$ (exponential)

$\lim_{x \to 3^+} y_2(x) = 37.171$ (quadratic)

$\lim_{x \to \infty} y_2(x) = \infty$ (exponential) ↑ ↓

$\lim_{x \to -\infty} y_e(x) = \emptyset$ (quadratic)

GROUP NAME: I ♡ Science

Date: 1/30/14

Student Names (First and Last)

Speaker/Presenter: Corinna

Writer/Prep: Lindsey Carberry

Leader/Collaborator:

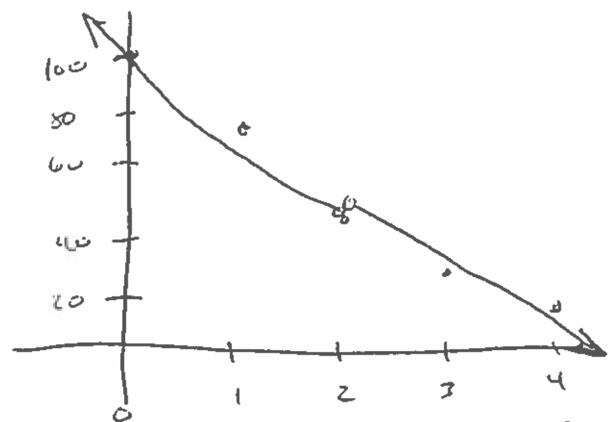
Independant Variable (x-axis): Time (Hours)

Dependant Variable (y-axis): Drug Concentration (PPM)

Conclusion (in words): As you approach 2 hrs ~~drug~~ going forward in time (from left) drug concentration approaches 56.187 PPM. As you ~~app~~ travel backward in time to 2 hrs (from right) drug concentration approaches 61 PPM.

Supporting Work:

Time (hrs)	Drug Concentration (PPM)
0	100
1	80
2	50
3	40
4	35



$\lim_{x \to 2^-} r_1(x) = 56.187$ Exponential

$\lim_{x \to 2^+} r(x) = 61$ Linear

$\lim_{x \to \infty} r_1(x) = -\infty$ Exponential

$\lim_{x \to -\infty} r(x) = \infty$ Linear

X	Y_1	Y_2
1.9	57.779	ERROR
2.0	56.187	61
2.1	ERROR	59.3

GROUP NAME: Team Squiggles

Date: 1/30/14

Independant Variable (x-axis): Number of Questions

Dependant Variable (y-axis): Time taken to complete question

Student Names (First and Last)

Speaker/Presenter: Mishelle

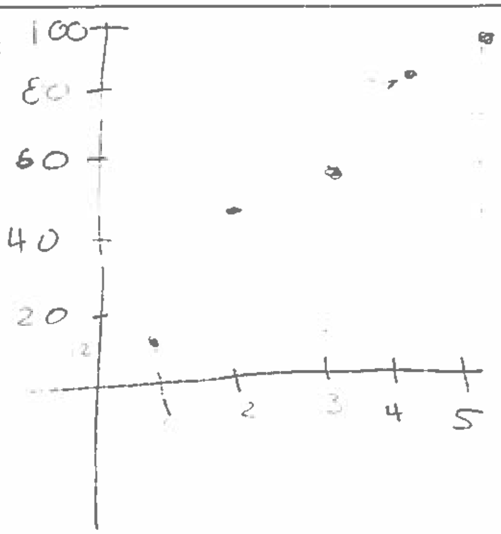
Writer/Prep: Kevin I

Leader/Collaborator: Kevin V

Anik - Trainee

Conclusion (in words): Each Question took additional time to finish.

Supporting Work:



x	y
1	12
2	50
3	60
4	88
5	100

left $\lim_{x \to 2.5^-} r(x) = 39.428$

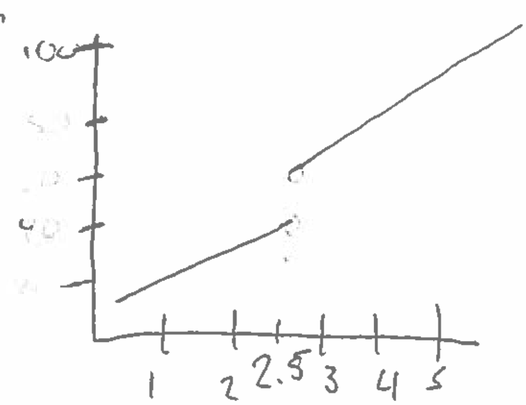
right $\lim_{x \to 2.5^+} r_3(x) = 57.125$

$\lim_{x \to \infty} r_{exp}(x) = \infty$

$\lim_{x \to -\infty} r_3(x) = 0$

$X \le 2.5$

$X \ge 2.5$



X	Y_1	Y_2
2.5	39.428	57.125
15420	Error	3.75E12
10	error	416.86

GROUP NAME: The Deloreans	Student Names (First and Last)
Date: 1/30/14	Speaker/Presenter: Greg McAvoy
Independant Variable (x-axis): Years	Writer/Prep: Harrison
Dependant Variable (y-axis): imports	Leader/Collaborator: Keith Mesroll

Conclusion (in words): going to the Year 1990 the percent is 18.48. After 1990, going ~~forward~~ the percent is 19.13

Supporting Work:

L_1	L_2
1970	3%
1980	14%
1990	19%
2000	24%
2010	29%
2014	38%

$Y_1 = -3.35\ldots e^{-4}x^2 + 2.029\ldots x + -2640.6\ldots$

$x \leq 1990$

$Y_2 \quad 9.480\ldots e^{-4}x^3 + -5.665x^2 + 11285.1\ldots$
-7493495.51

$x \geq 1990$

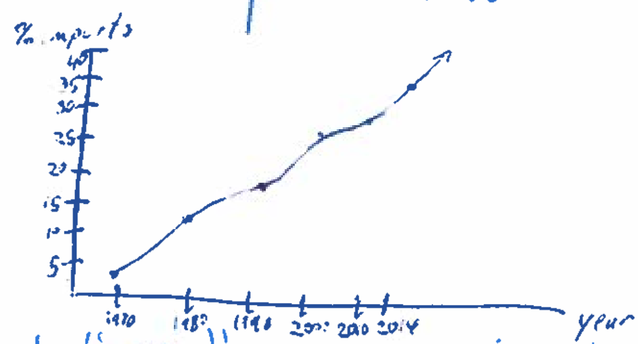
$\lim_{x \to -\infty} f_1(x) = 0$

$\lim_{x \to 1990^-} f_2(x) = 18.48$ Quad

$\lim_{x \to \infty} f_3(x) = \infty$

$\lim_{x \to 1990^+} r_3(x) = 19.13$ Cubic

X	Y_1	Y
1989	17.786	error
1990	18.48	19.13
1991	error	19.451



So when X goes to "∞", Y reaches 100%.
When X goes to "−∞", Y reaches 0%

GROUP NAME: [illegible] shoes

Date: 1/30/14

Student Names (First and Last) Valeen Sinclair

Speaker/Presenter: Dominique

Writer/Prep: Corrina

Leader/Collaborator: Lindsy

Independant Variable (x-axis): $1,000 (in hundred thousands)

Dependant Variable (y-axis): Shoes

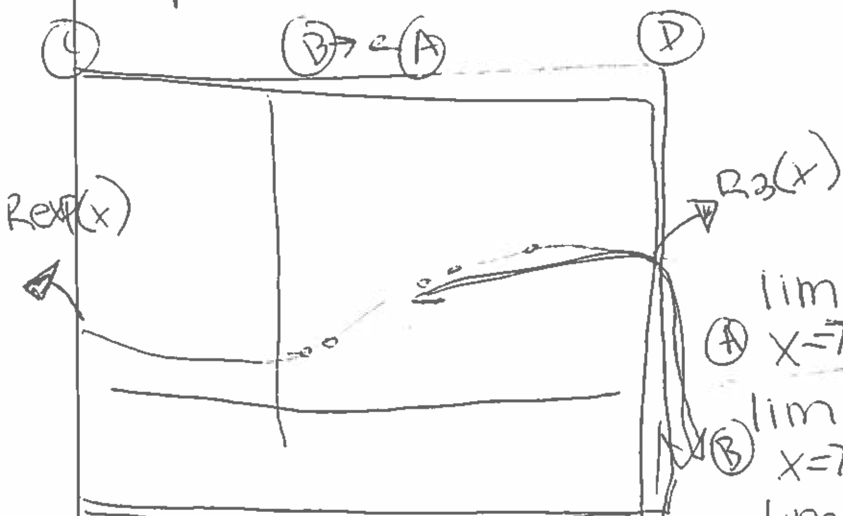
Conclusion (in words): ~~propose~~ Approach
As we ~~get~~ to $505,000 we are increasing to 220 pairs of shoes approach from the negative
As we we ~~decrease~~ to 505,000 we are decreasing

Supporting Work:
to 218 pairs of shoes

x	y
100	145
205	170
505	185
607	280
909	330

TAble

x	y_1	y_2
505	220.04	218.53
506	Error	218.86
504	219.82	Error



exponential & cubic Regression

(A) $\lim_{x \to 505^+} Rexp(x) = 220.04$ (As I INCREASE)

(B) $\lim_{x \to 505^-} R_3(x) = 218.53$ (As I DECREASE)

(C) $\lim_{x \to -\infty} Rexp(x)$ [illegible]

(D) $\lim_{x \to +\infty} R_3(x) = -\infty$

GROUP NAME:

Date: 4/28

Independant Variable (x-axis): $ in 1,000.00

Dependant Variable (y-axis): # of Shoes

Student Names (First and Last)

Speaker/Presenter: Lindsy Lansbury

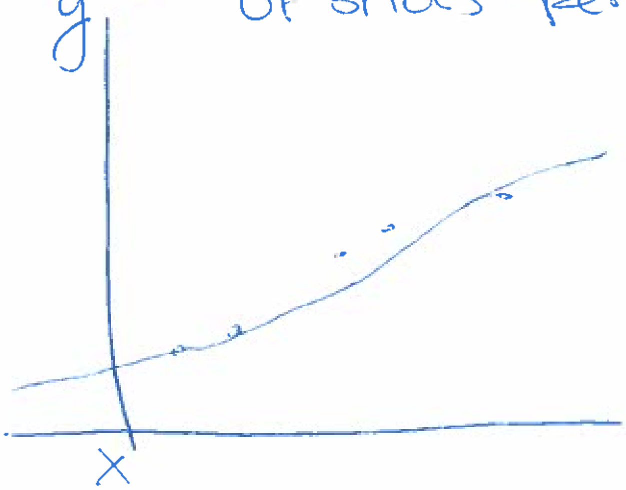
Writer/Prep: Val Sinclair

Leader/Collaborator: Meg[illegible] Boot[illegible]

Conclusion (in words): x value Dy/Dx at 505 is 0.2236...
at $505,000, a person is getting 0.2236 pairs of shoes per thousand dollars

Supporting Work:

x	y
100	145
205	170
505	185
607	280
909	330



y=a*b^x

a=131.70...

b=1.00...

3. $\frac{y_1(505) - y_1(504.9)}{(505-504.9)}$

0.2236...

1) $\frac{205-607}{170-280} = \frac{-402}{-110} =$ msec= 3.65...

[2nd] [Trace] #6 value (dy/dx)

y_1 505 = 0.2236...

2) $\frac{y_1(505)-y_1(504)}{(505-504)} = 0.2235...$

GROUP NAME: Sumev.

Date: [illegible]

Independant Variable (x-axis): ~~[illegible]~~ yrs of driving

Dependant Variable (y-axis): car insurance

Student Names (First and Last)

Speaker/Presenter: Kevin I.

Writer/Prep: Michelle A.

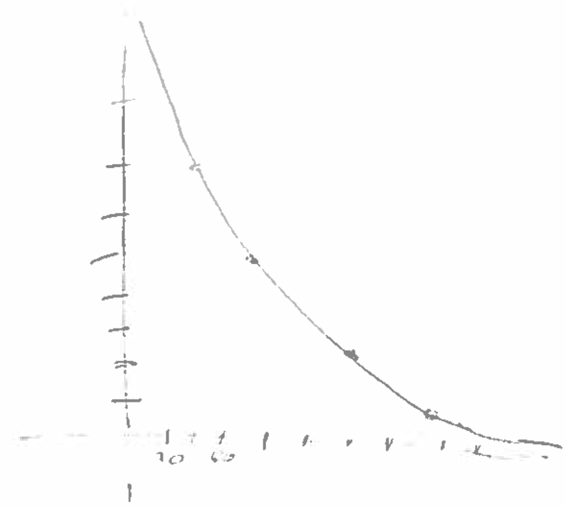
Leader/Collaborator: Kevin V

Anik P - Associate/trainee

Conclusion (in words): The longer you drive, the lower your insurance rate is at 20 years of age you insurance fee drops a -.64 $ per year

Supporting Work:

x	y
20	50
50	30
[illegible]	[illegible]
[illegible]	[illegible]



$$\frac{Y_1(90) - Y_1(20)}{90-20} = -.48$$

$$\frac{Y_1(40) - Y_1(20)}{40-20} = -.62$$

$$\frac{Y_1(25) - Y_1(20)}{25-20} = -.66$$

$$\frac{dy}{dy} = -.64$$

GROUP NAME: Engineering People

Date: 1/28

Independant Variable (x-axis): Years

Dependant Variable (y-axis): Rust

Student Names (First and Last) (Keith Meserall)

Speaker/Presenter: Brandon Reyes

Writer/Prep: Harrison

Leader/Collaborator: Greg McAdoy

Conclusion (in words):

· years rust y_1 by the desert

→ -"shit gets rusty" ←

Supporting Work:

years rust y_1 by the desert

1970	3
1980	14
1990	19
2000	24
2010	28
2014	38

a = -3.33

b = 2029

c = -2640.69

r^2 = 0.95

Average rate of change = -3.33

At 1999 the Rust Y. goes up .68

$$\frac{Y_1(1970) - Y_1(2014)}{1970 - 2014} = ~~[illegible]~~\ .687$$

$$\frac{Y_1(1980) - Y_1(2010)}{1980 - 2010} = ~~[illegible]~~\ .693$$

$$\frac{Y_1(1990) - Y_1(2000)}{1990 - 2000} = ~~[illegible]~~\ .696$$

$$\frac{Y_1(1999) - Y_1(2000)}{1999 - 2000} = ~~[illegible]~~\ .687$$