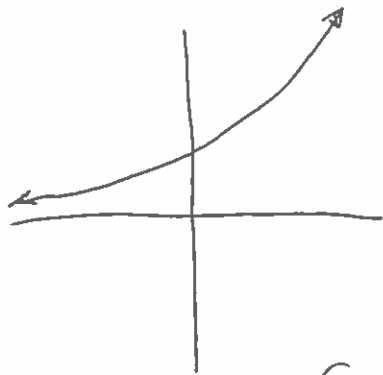


Inverse to Exponentials.



Pass HLT. \rightarrow Has an inverse.

To Find Inverse...

Solve for x

$$x = f(y)$$

\uparrow
create This
Function

$$x = \log_B(y)$$

("log base B of y")

Property of Logs

① Definition of Logs.

$$y = B^x \Leftrightarrow x = \log_B y$$

or

$$y^{-1} = \log_B x$$

\rightarrow Solve for ~~base~~ exponent

Ex $10^x = 100 \xrightarrow{\text{①}} x = \log_{10}(100)$

$$= \log(100)$$

$$= 2$$

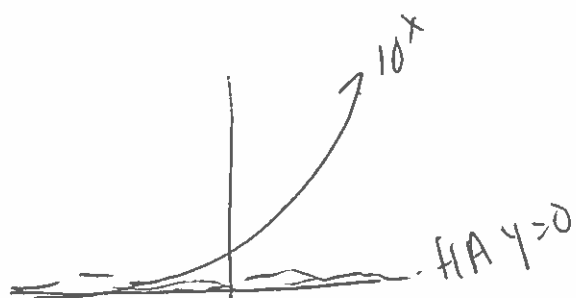
Definition

common log

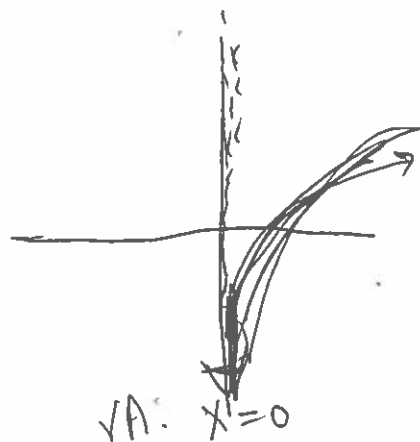
$$\log \equiv \log_{10}$$

Natural log

$$\ln \equiv \log_e$$



Domain: \mathbb{R}
Range: $(0, \infty)$



Domain: $(0, \infty)$
Range: \mathbb{R}

$$x = \log_{10}(0)$$

$$10^x \neq 0$$

Domain Rules

1. Can't Divide by zero
2. Can't square root negative.
3. Can't log a non-positive

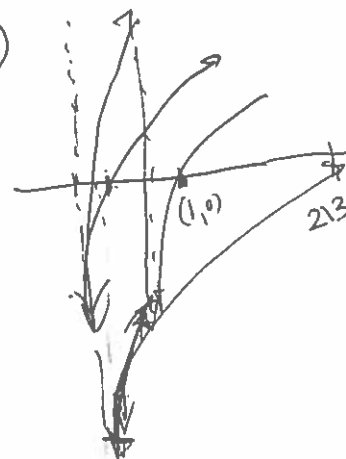
Ex

$$y = 3 \cdot \log(x+2) - 7$$

Parent Function $\log_{10}(x)$

1. left by 2
2. stretch by 3
3. Down by 7

$$VA: x = -2$$



PH 8	⇒	10^{-8}	=	$[OH^-]$	$\frac{1}{100,000,000}$	BASIC
PH 7	→	10^{-7}	=	$[H^+]$	$\frac{1}{10,000,000}$	
PH 6	→	10^{-6}			$\frac{1}{1,000,000}$	
PH 3	→	10^{-3}			$\frac{1}{1,000}$	ACID.
PH 1	→	10^{-1}			$\frac{1}{10}$	

$$PH = -\log [H^+]$$

Richter Scale. $R = \log \left[\frac{\text{vibrat}}{\text{stete}} \right]$

X-intercept ($y=0$)

$$0 = 3 \log(x+2) - 7$$

+7

$$\frac{7}{3} = \frac{3}{3} \log(x+2)$$

$$\frac{7}{3} = \log_{10}(x+2)$$

$$10^{\frac{7}{3}} = x+2$$

$$10^{\frac{7}{3}} - 2 = x$$

$$213.44 = x$$

Change of Base

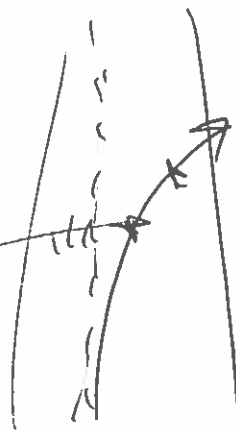
$$\log_B A = \frac{\log A}{\log B} = \frac{\ln A}{\ln B}$$

$$\log(A) / \log(B) = \ln(A) / \ln(B)$$

$$\sqrt{A}: x=3$$

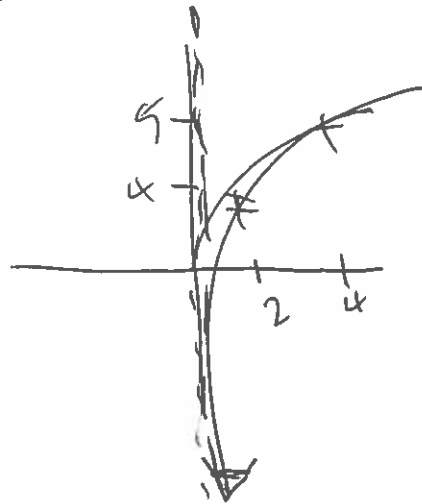
$$\log_4(x-3)$$

x	y
4	0
7	1
19	2
67	3



$$3 + \log_2 x$$

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



GROUP NAME: Real Big Fish

Logo: 

Date: 10/1/13

Topics: logs & ln

Student Names (First and Last)

Speaker/Presenter: Dallen

Writer/Prep: Tabbi

QC/Leader: Justin & Elise

Instructions:

In Regression

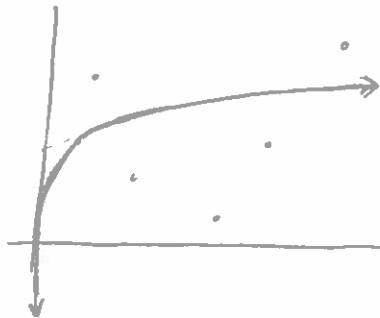
Data

\$	Acts of Violence
7,000	100
10,000	53
17,000	35
20,000	80
27,000	120

In Regression:

$$y = 47.809... + 11.138... \ln x$$

Graph



In Calculator

L1	L2
7	100
10	53
17	35
20	80
27	120

Solver

$$\begin{aligned} \square x &= 0.0137... \\ y &= 0 \end{aligned}$$

For there to be 0 crimes committed, schools must spend \$13,672 per student

$$\begin{aligned} x &= 2 \\ \square y &= 55.529... \end{aligned}$$

If schools spend \$2,000, there will be ≈ 55 crimes committed.

GROUP NAME: Science

Logo:



Student Names (First and Last)

Speaker/Presenter: _____

Date: October 1, 2013

Writer/Prep: Nisha Patwardhan

Topics:

QC/Leader: Jenna Giarofalo

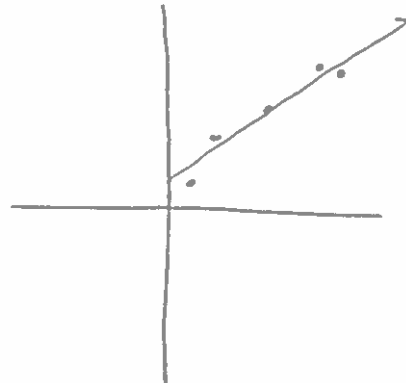
Instructions:

~~Linear~~ Log Regression:

$$y = a + b \ln x$$

$$a = -13110.65919$$

$$b = 1727.922083$$



L1 Year	L2 Obesity Rate
1990	12 %
1991	17 %
1998	22 %
2004	27 %
2005	30 %
2006	27 %
2009	30 %
2010	31 %

GROUP NAME: MEABS

Logo:



Student Names (First and Last)

Speaker/Presenter: Ahmed

Date: ~~3/10/13~~ @ 10/01/13

Writer/Prep: Jen/Kero

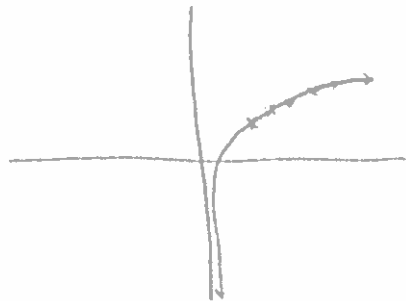
Topics:

10/01/13 or 01/10/13

QC/Leader: Daniella

Instructions: use ln reg on data

NO. IS	GPA
L1	L2
2	2.5
3	2.7
4	3
5	3.5
6	3.7
7	4



$$y = a + b \ln x$$

$$a = 1.413 \dots$$

$$b = 1.305 \dots$$

MATH 0: Solver

① VARS : 5 Stat ① 1 Reg Eq - Y[↓]

ALPHA: 1

X = ? Guess
2

Y = 0 ALPHA ENTER

GROUP NAME: Business Wizards

Logo: 

Date: 10/1/13

Topics:

Student Names (First and Last)

Speaker/Presenter: Jason Hayes

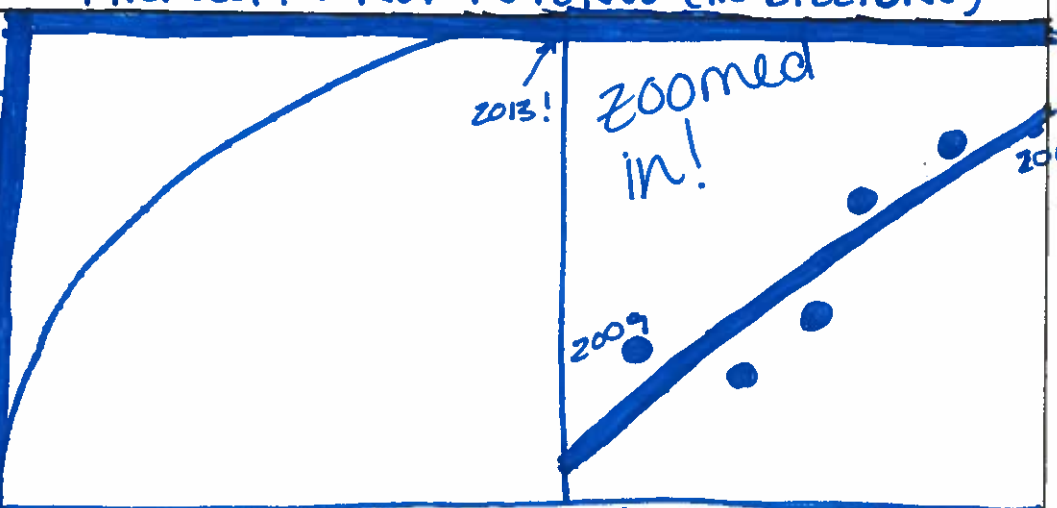
Writer/Prep: Giulliana Fonseca

QC/Leader: Rachel Ralston

Instructions: logarithmic regression

MICROSOFT'S NET REVENUE (IN BILLIONS)

L1	L2
2008	60.42
2009	58.44
2010	62.48
2011	69.94
2012	74.3
2013	77.31



↑ DATA ↓

year 0.
Birth of Jesus!

↑ GRAPH ↓