

Exponential Regression

1. The following is a table comparing the number of people who got sick after exposure to a certain virus. The growth pattern is assumed to be exponential. **How many will be sick 6 hours after initial exposure to the virus?**

Hours after exposure	1	2	3	4
Number of people sick	20	47	98	205

Use the regression feature of the calculator.

L1	L2	L3	1
1	20	---	
2	47	---	
3	98	---	
4	205	---	
---	---	---	
---	---	---	
L1(1)=1			

EDIT	TESTS
QuadReg	
CubicReg	
QuartReg	
LinReg(a+bx)	
LnReg	
ExpReg	
PwrReg	

ExpReg
y=a*b^x
a=9.576393741
b=2.163365908

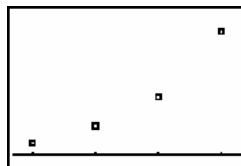
Using the information that the calculator has determined, the general formula is: $y = 9.576393741(2.163365908)^x$ where y is the number of people and x is the number of hours after exposure. Then $y = 9.576393741(2.163365908)^6$ is the solution to the question. Approximately 982 people will become sick after 6 hours.

2. Determining whether a regression is exponential.

Does this model *actually* fit an exponential form?

When the x-coordinates of a pair is plotted against the log of the y-coordinate and the resulting plot is a straight line, then the regression is exponential in nature. Use the [LIST] and [STAT PLOT] features to determine if the model is indeed exponential.

L1	L2	L3	1
1	20	---	
2	47	---	
3	98	---	
4	205	---	
---	---	---	
---	---	---	
L1(1)=1			



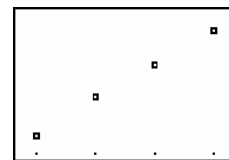
L1	L2	L3	3
1	20	---	
2	47	---	
3	98	---	
4	205	---	
---	---	---	
---	---	---	
L3=log(L2)			

Use STATPLOT to do a scatter plot.

Let $L3 = \log(L2)$

L1	L2	L3	3
1	20	1.3010	
2	47	1.6721	
3	98	1.9912	
4	205	2.3118	
---	---	---	
---	---	---	
L3(1)=1.301029995...			

STAT	Plot2	Plot3
Off		
Type:		
Xlist:	L1	
Ylist:	L3	
Mark:	+	



Use STATPLOT to plot L1 and L3

The points appear to be in a straight line.