Math1231 Lecture 2 Using TI-84(plus)

He Wang

Northeastern University

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Scatter Plots and Models on the TI-84

Example 1. The following table gives the number (in thousands) of laptops sold per month after it is released. Show work and give **units** for each answer.

# of months after it released	2	4	6	8	10	12	14
# laptops (thousands per month)	580	560	540	330	200	140	120

(a). Let x stand for the number of months after the laptops released, and let $f(x)$ stand for the number of laptops (in thousands) sold per month. Fit **the best model** to the data. Round all coefficients to 3 decimal places.

Using TI-84:(ClassPacket p.41)

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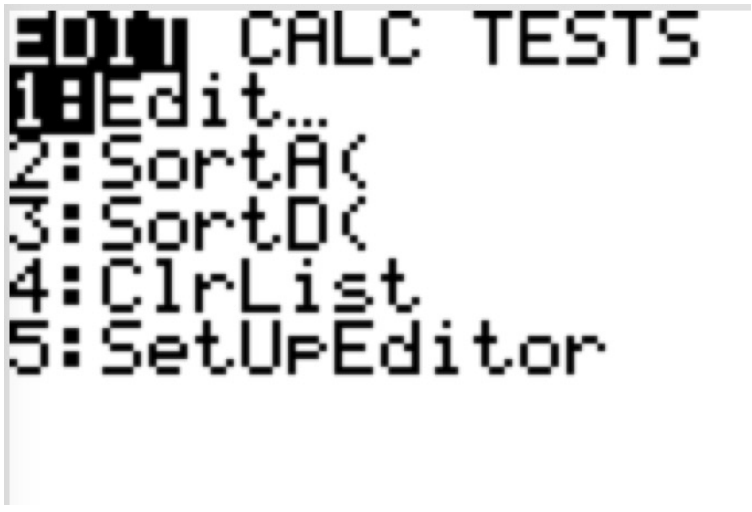
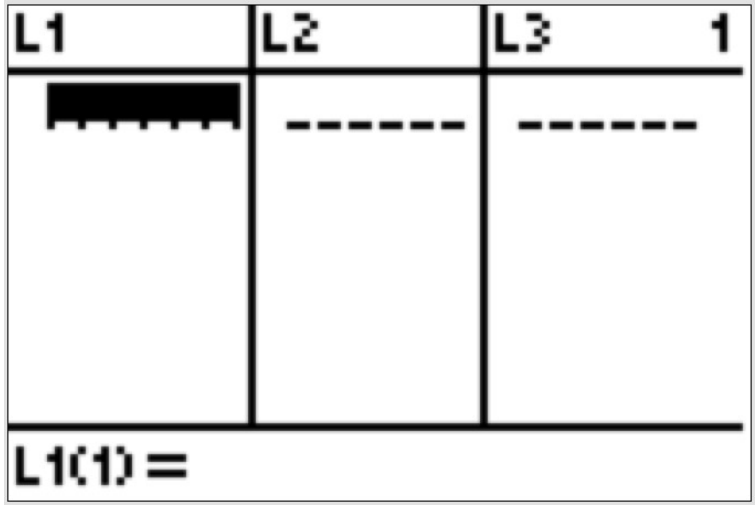
Press **STAT**, get graph1, (then press **ENTER** get graph2)





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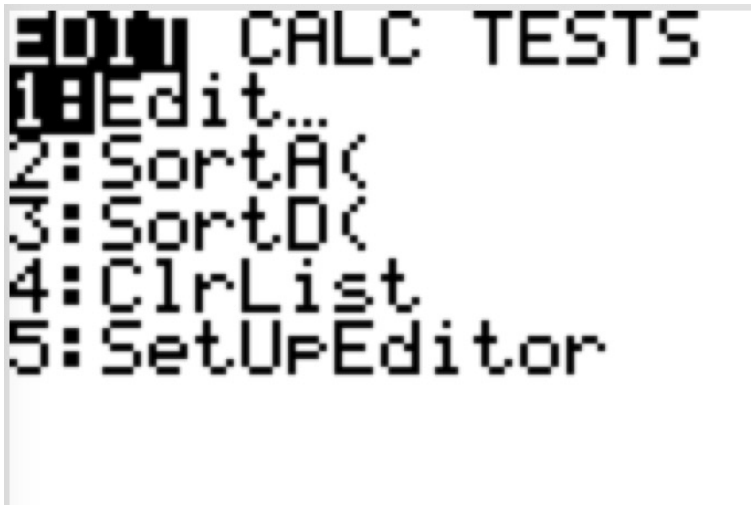
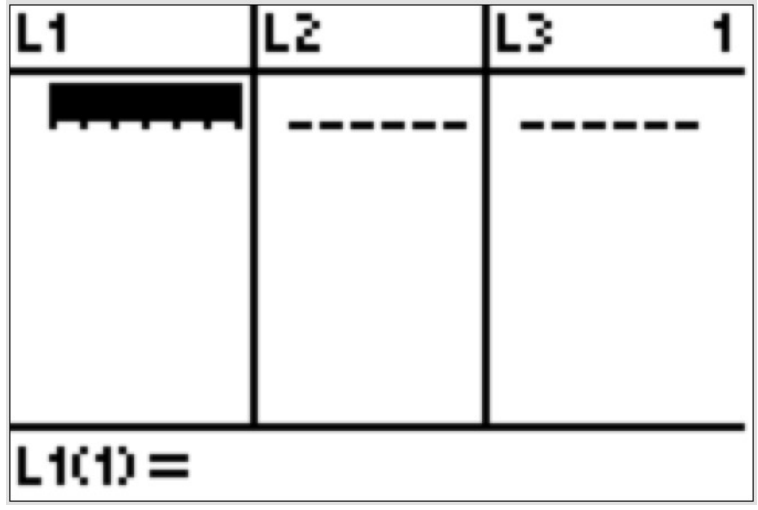
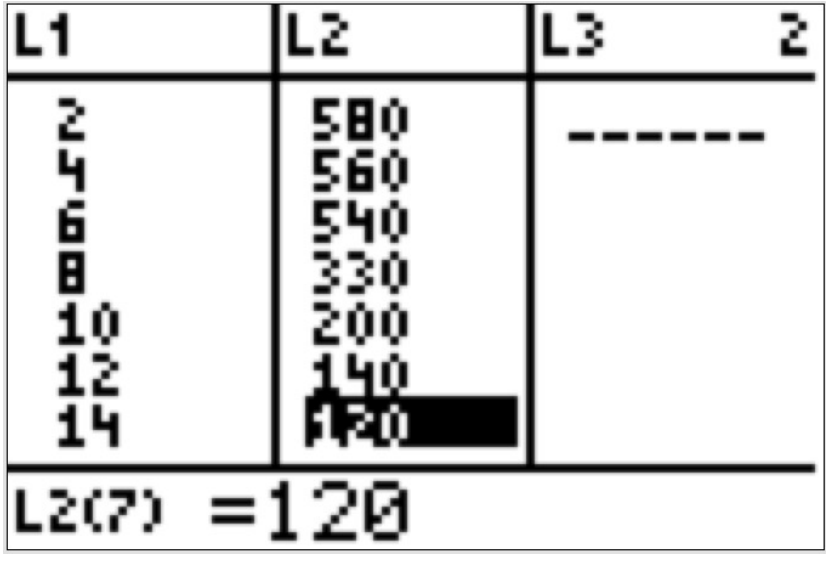




Enter data in **L1** and **L2**.



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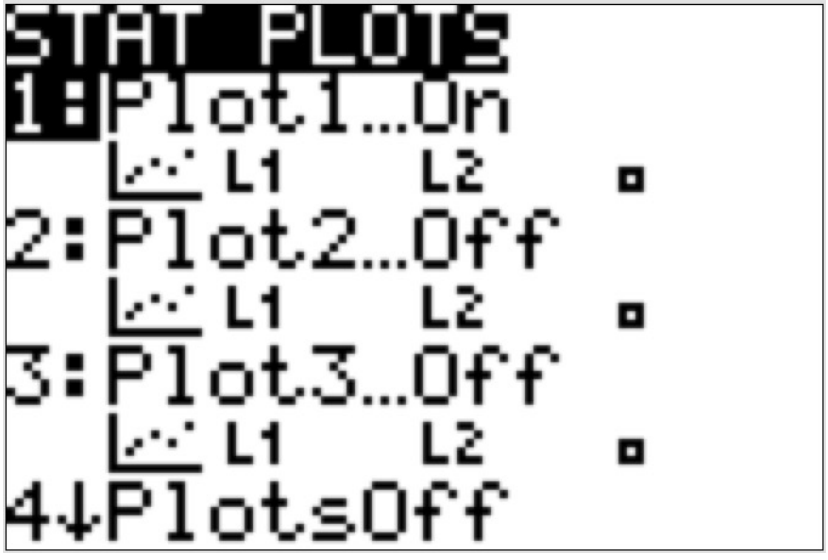
Press **2nd**. Press **Y=**. (This gives STAT PLOT)



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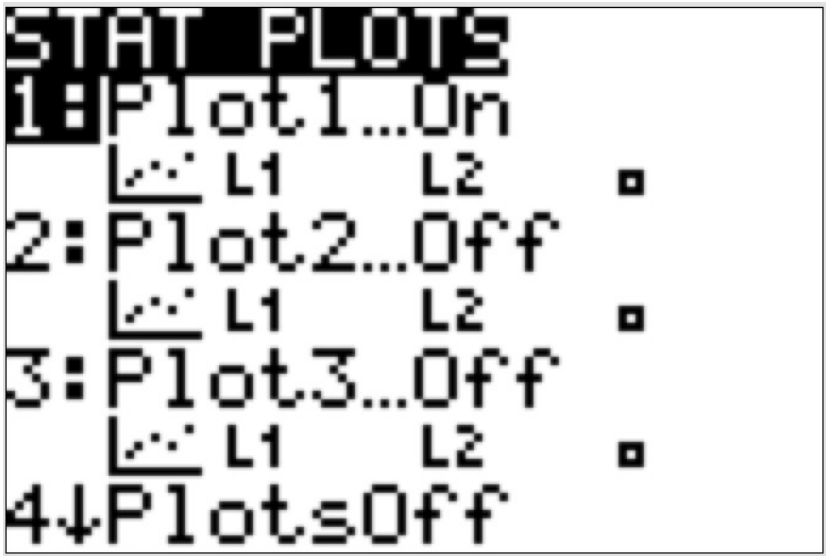

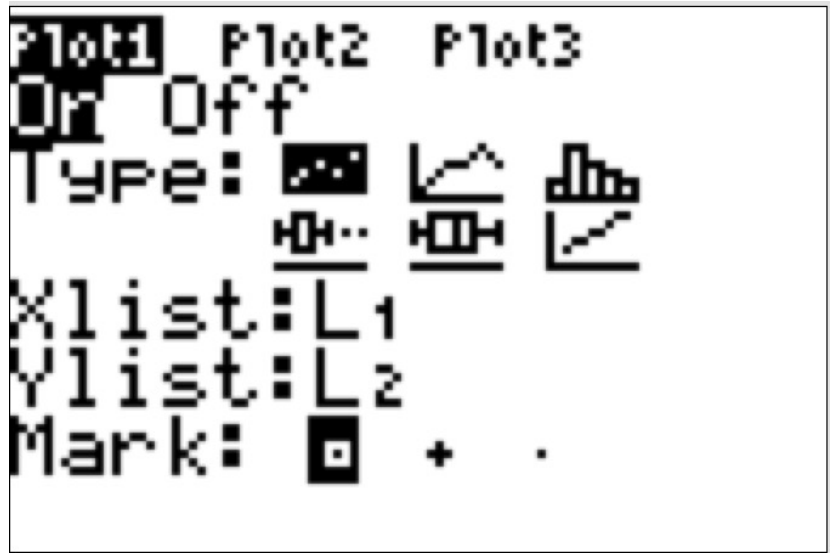

Make sure that **PLOT1** is **ON**. Make sure **X List** is set to **L1** and **Y List** is set to **L2**.

Press **ZOOM**.


ZOOM MEMORY
1:ZBox
2:Zoom In
3:Zoom Out
4:ZDecimal
5:ZSquare
6:ZStandard
7↓ZTrig

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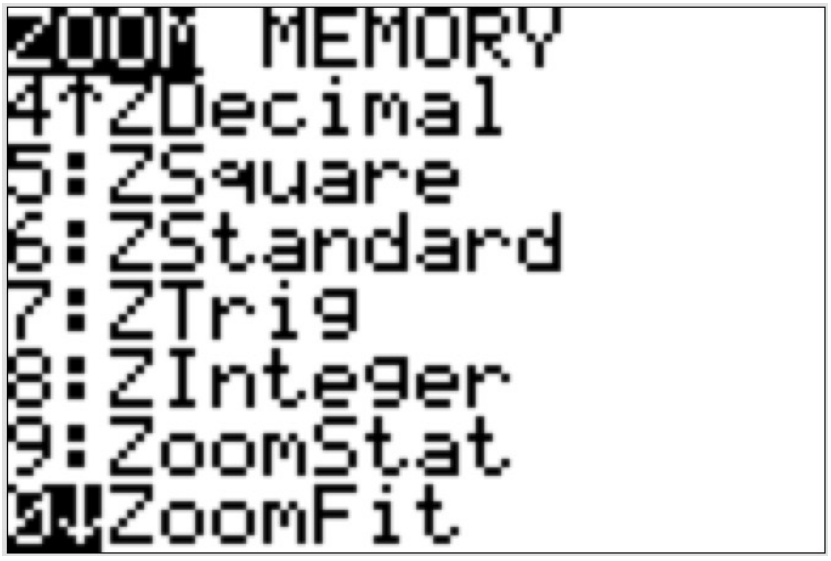
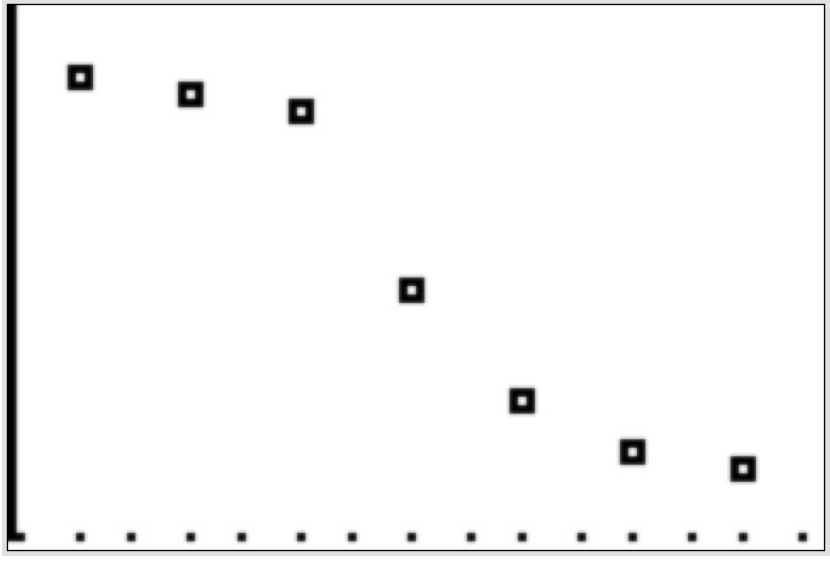

ZOOM MEMORY
4↑ZDecimal
5:ZSquare
6:ZStandard
7:ZTrig
8:ZInteger
9:ZoomStat
0↓ZoomFit

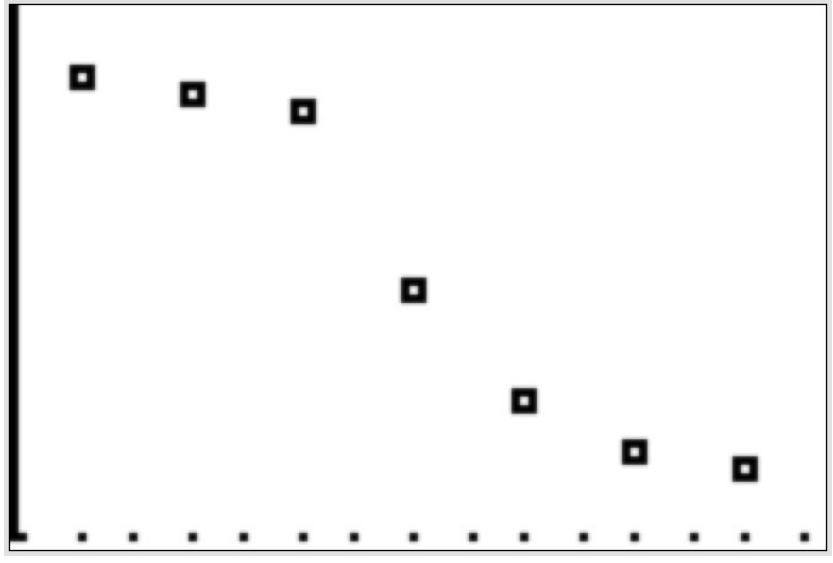
Press **ZOOM**.

Press **9**.



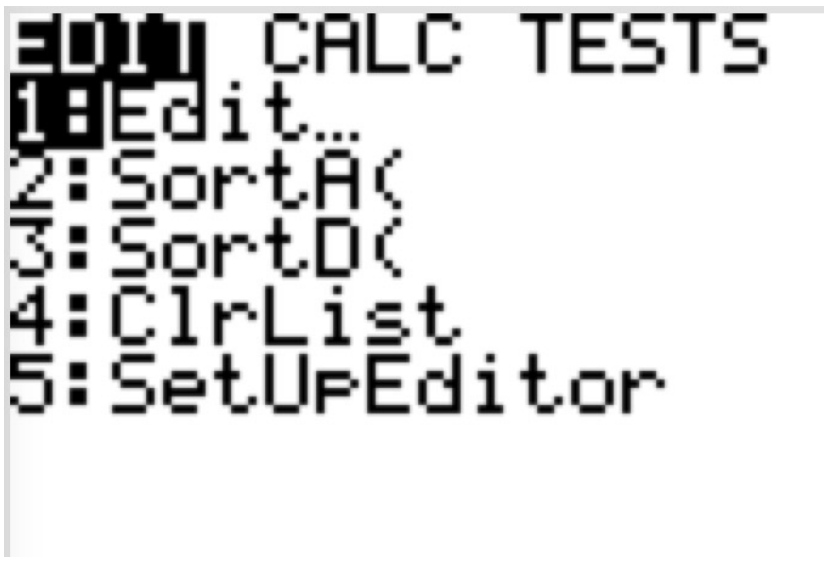
Press **ZOOM**.

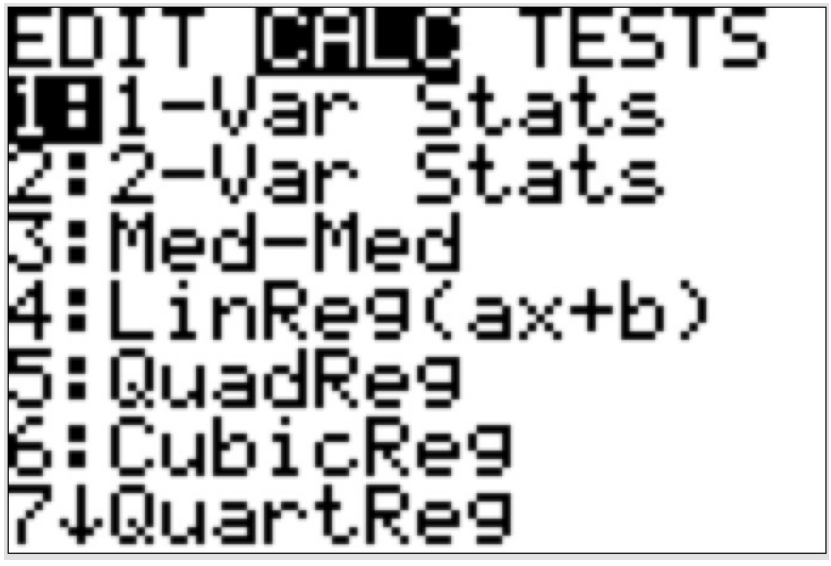
Press **9**.



Logistic model

Press **STAT**,(graph1), then Press $\rightarrow$ (**right** arrow button) (graph2)





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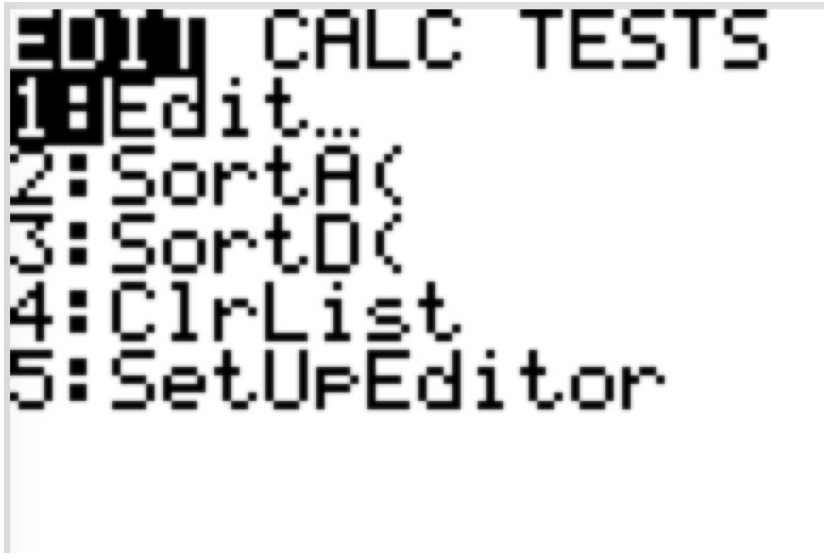

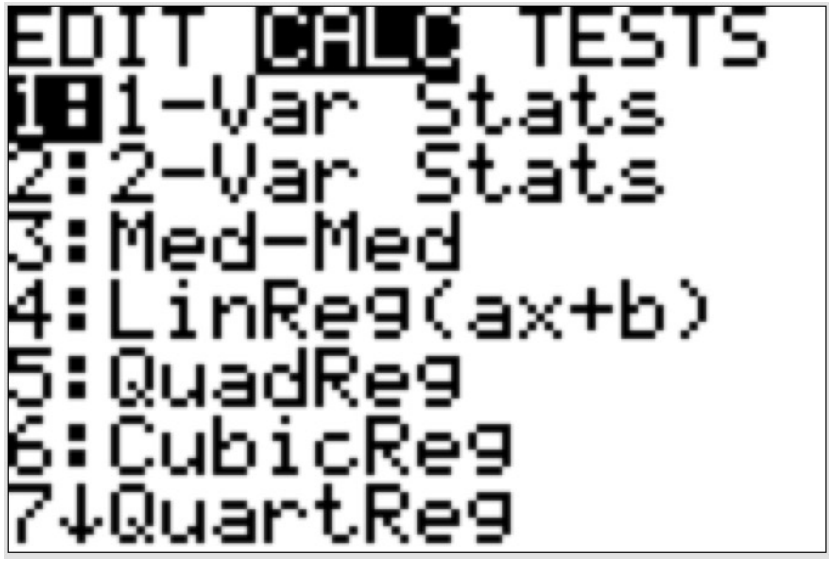

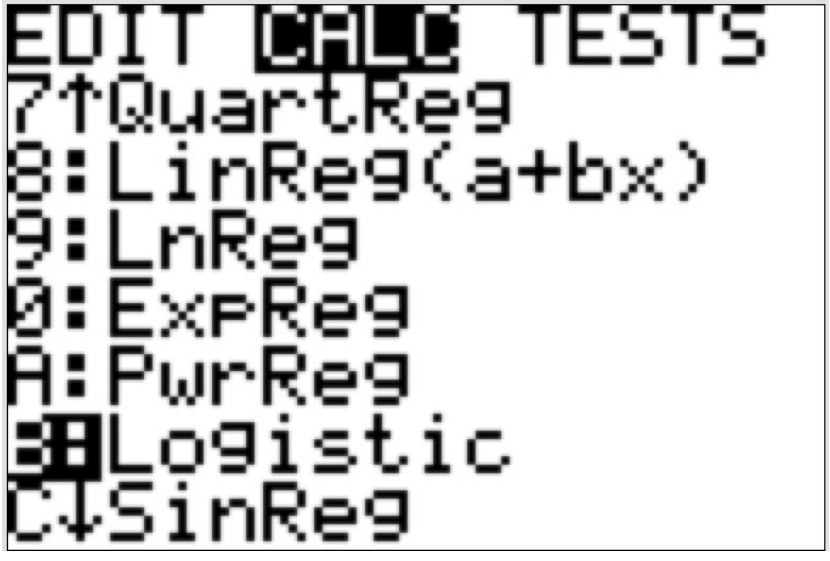

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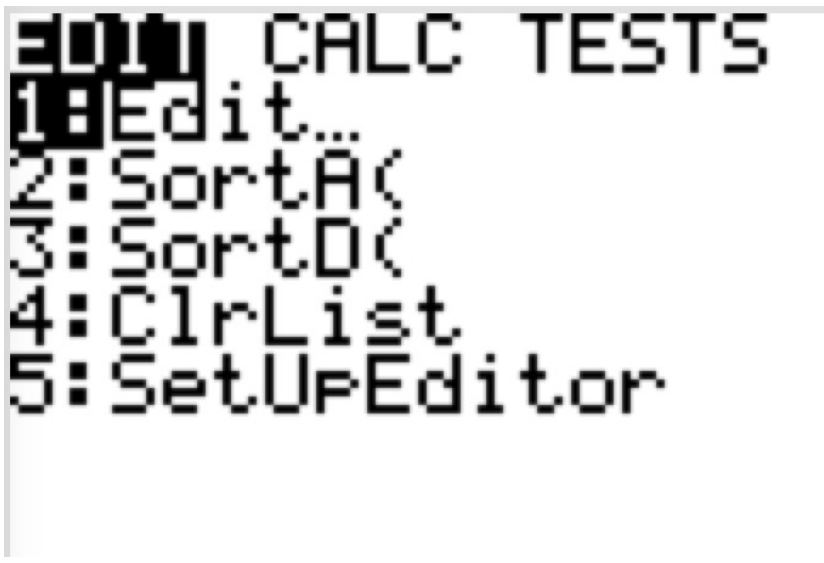

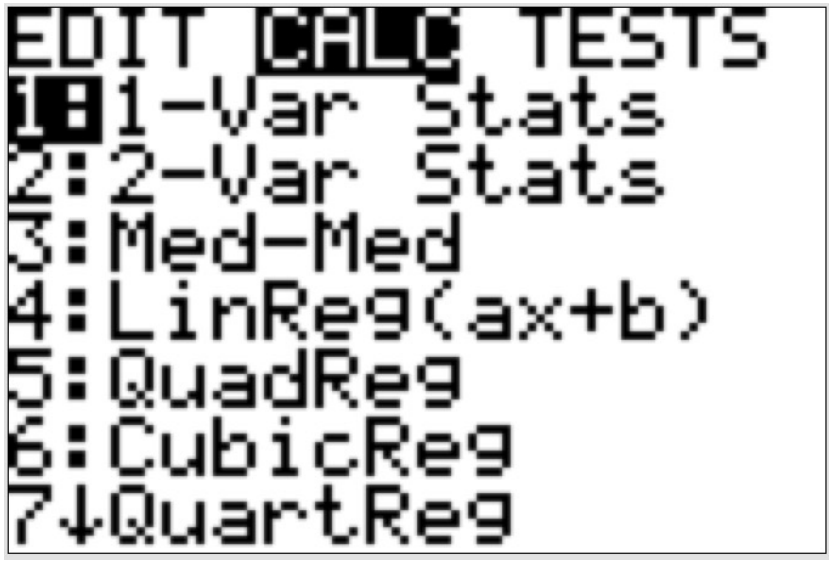

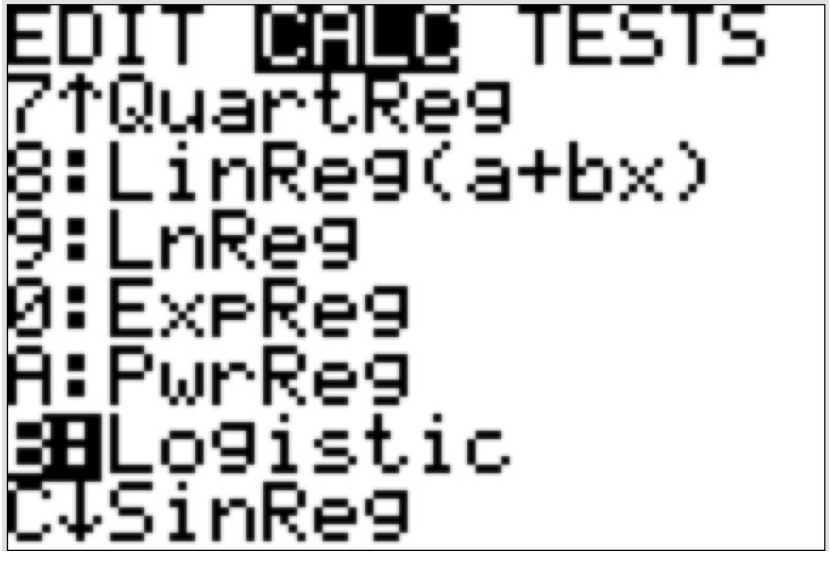

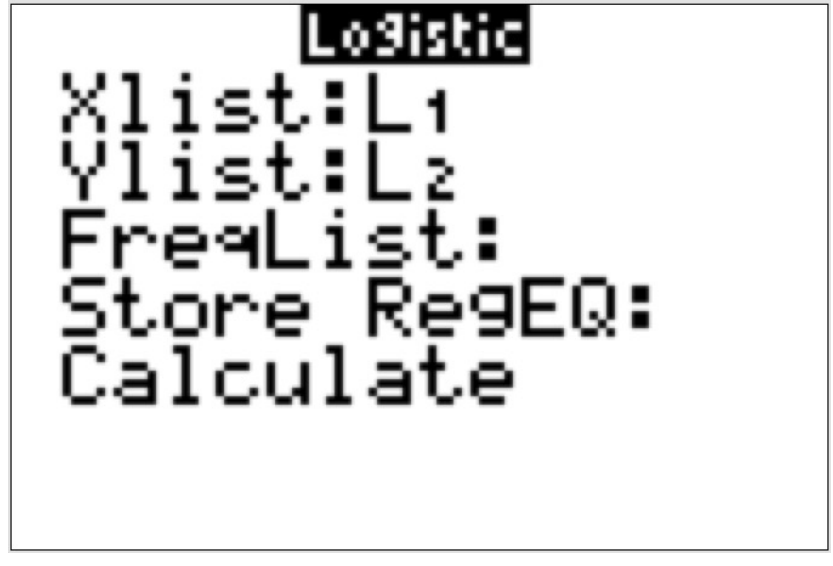

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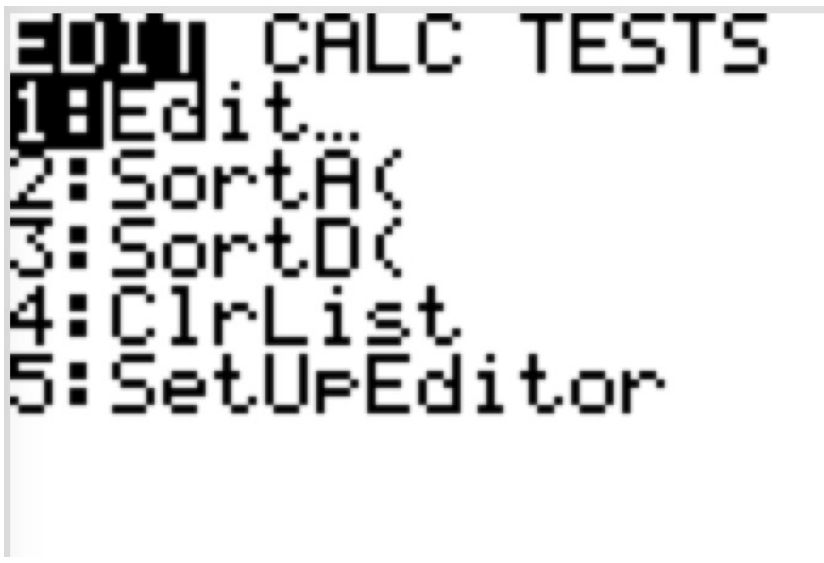
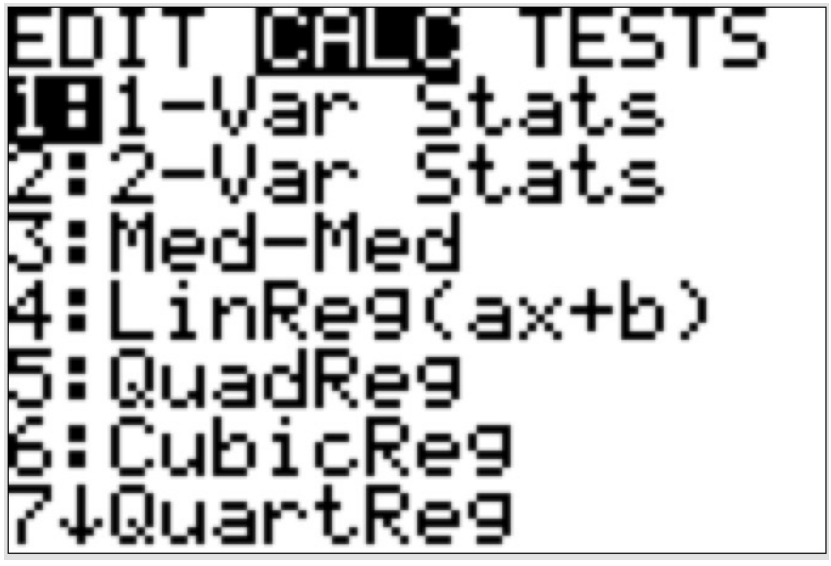
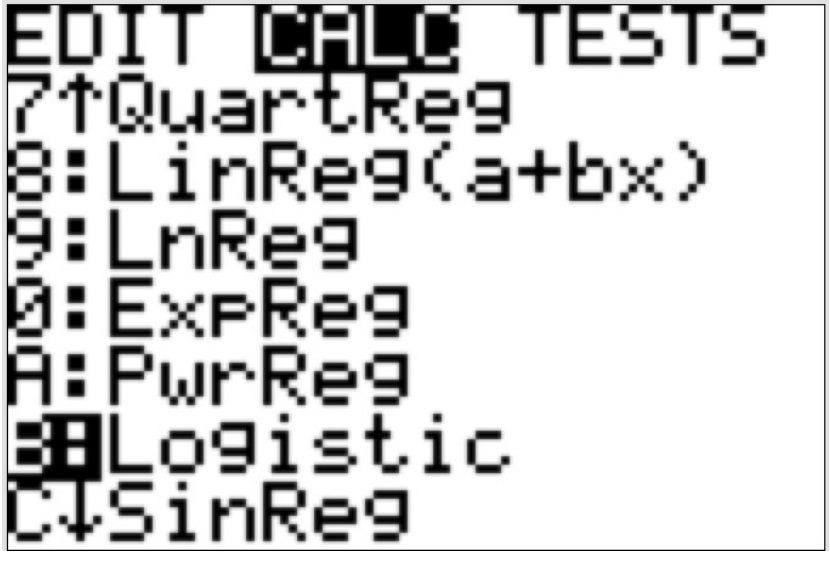
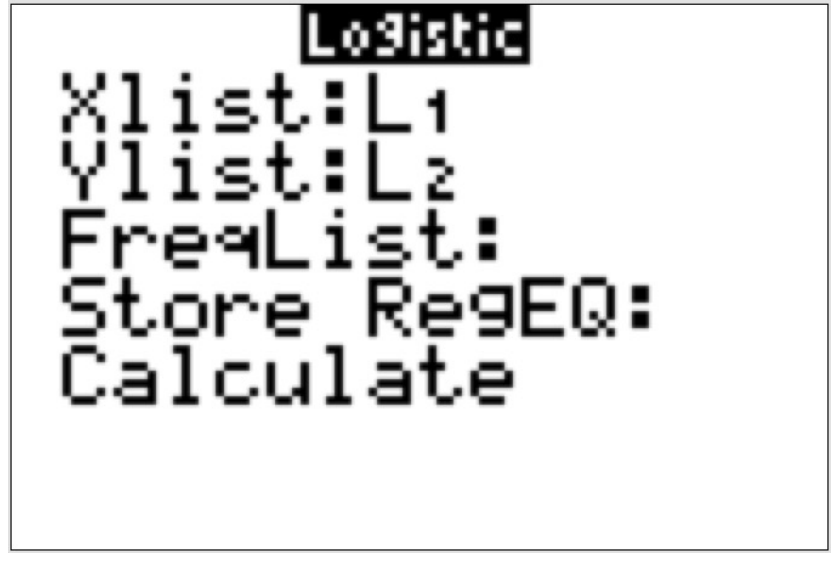


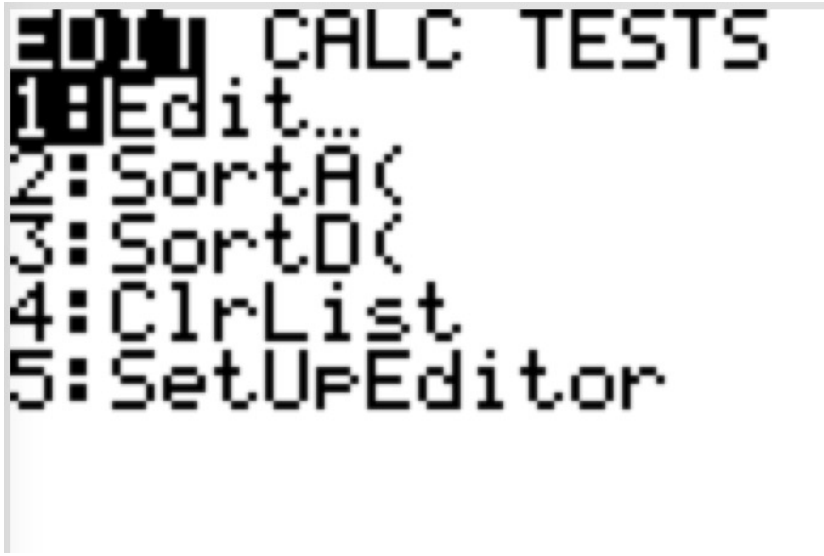


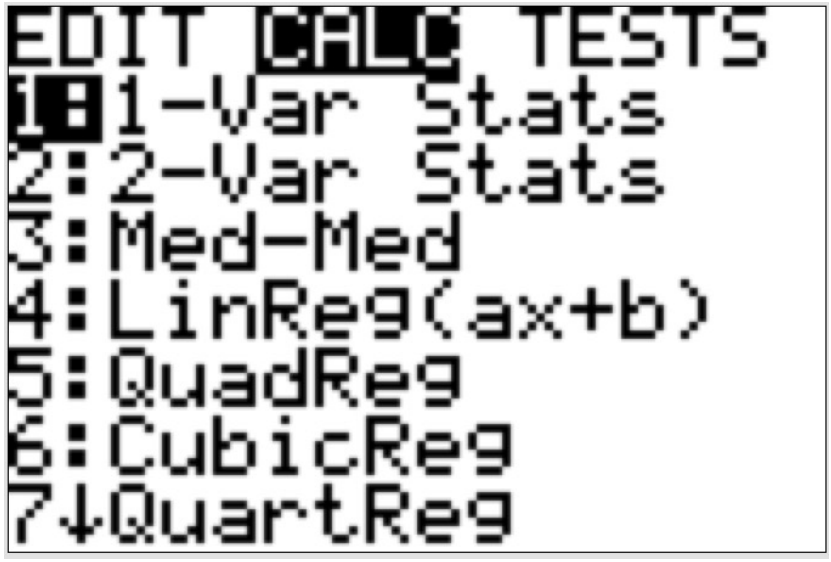


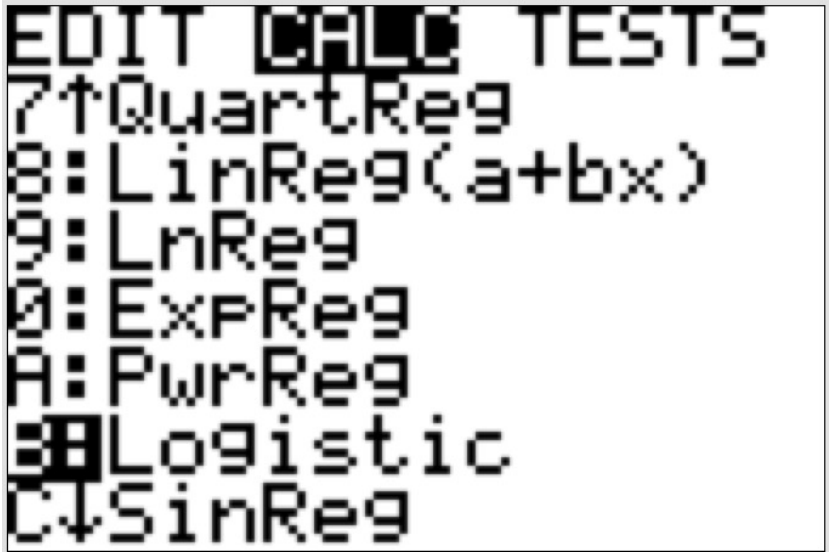


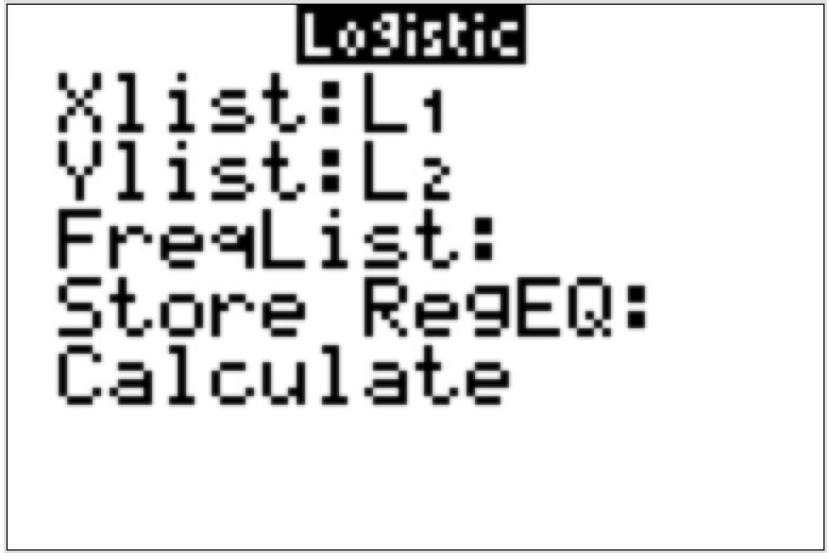
For TI-83(plus): Logistic (L1,L2,Y1)

Press **STAT**,(graph1), then Press $\rightarrow$ (**right** arrow button) (graph2)





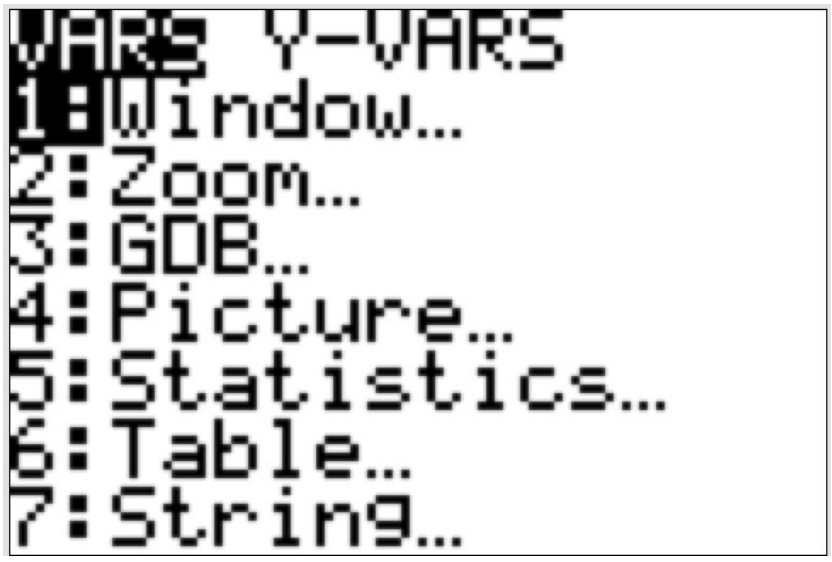


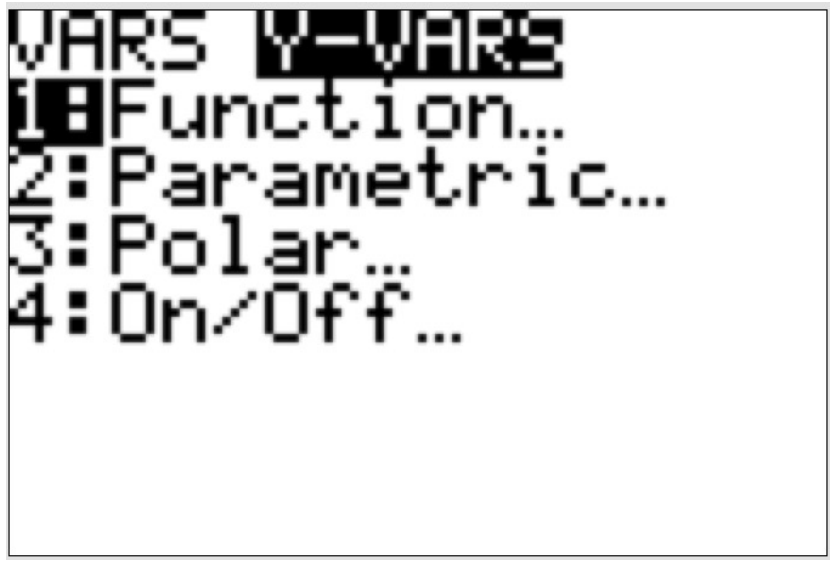


For TI-83(plus): Logistic (L1,L2,Y1)

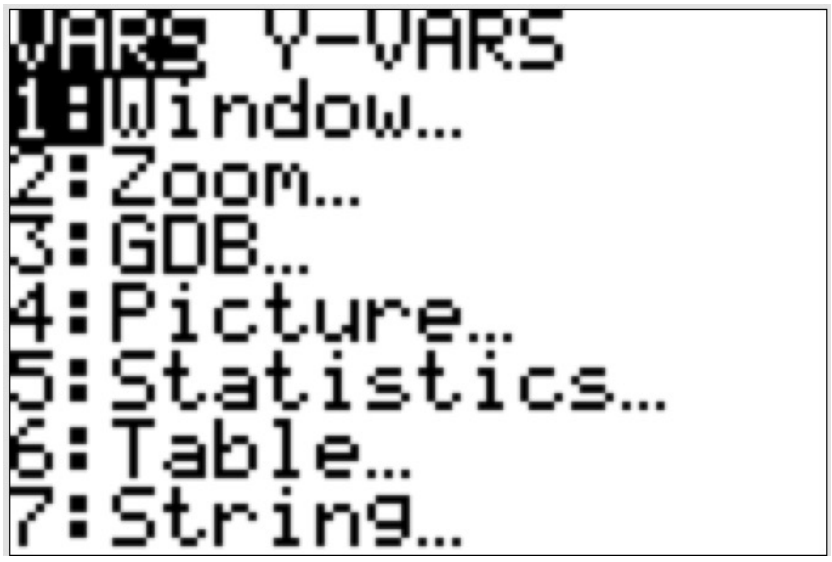
4 Linear, 5 Quadratic, 6 Cubic, 0 Exponential, B Logistic model

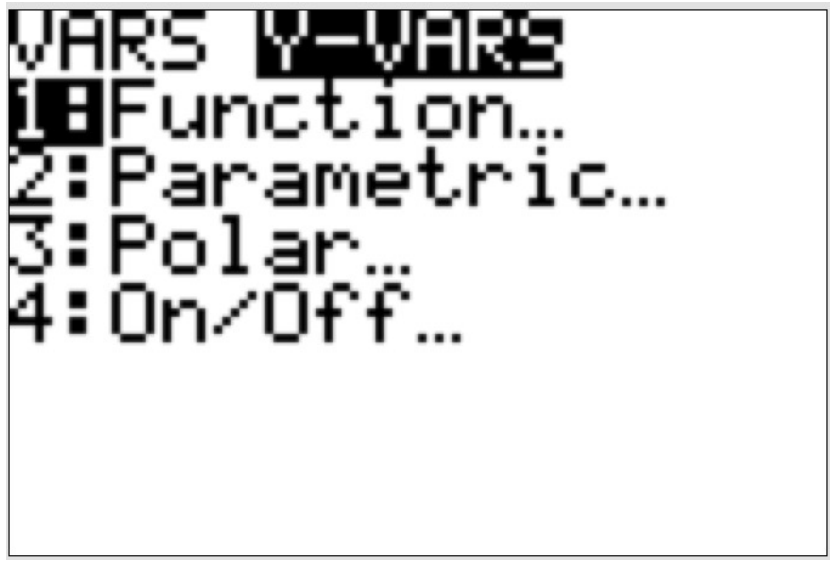
Press **VARS**,(graph1) then press $\rightarrow$ (**right** arrow) (**Y-VARS**)(graph2)





Press **VARS**,(graph1) then press $\rightarrow$ (**right** arrow) (**Y-VARS**)(graph2)





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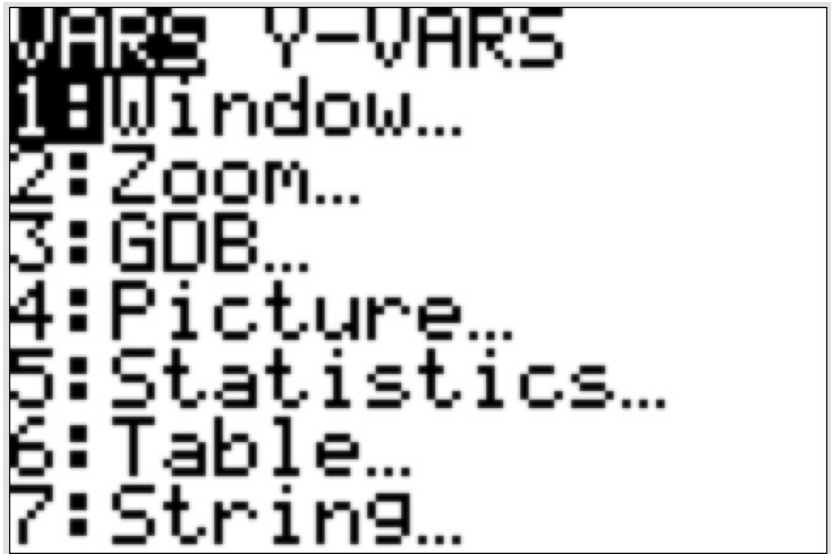
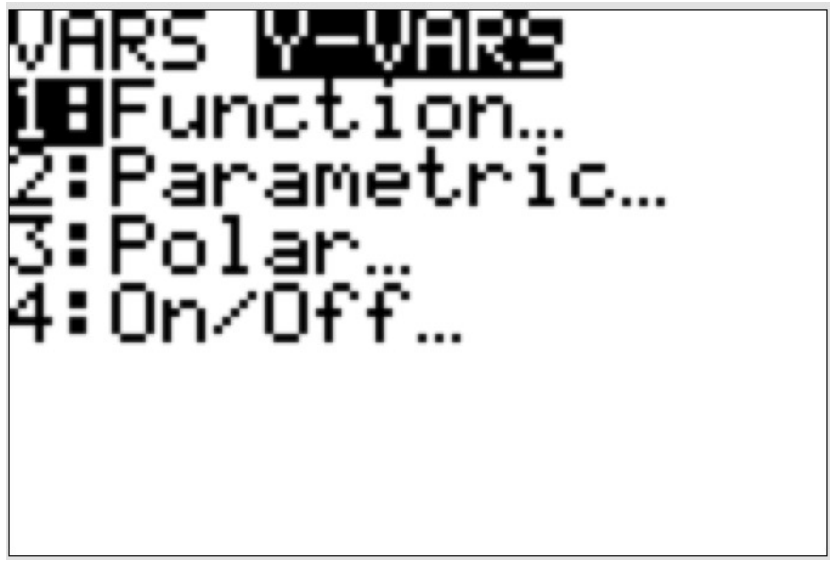
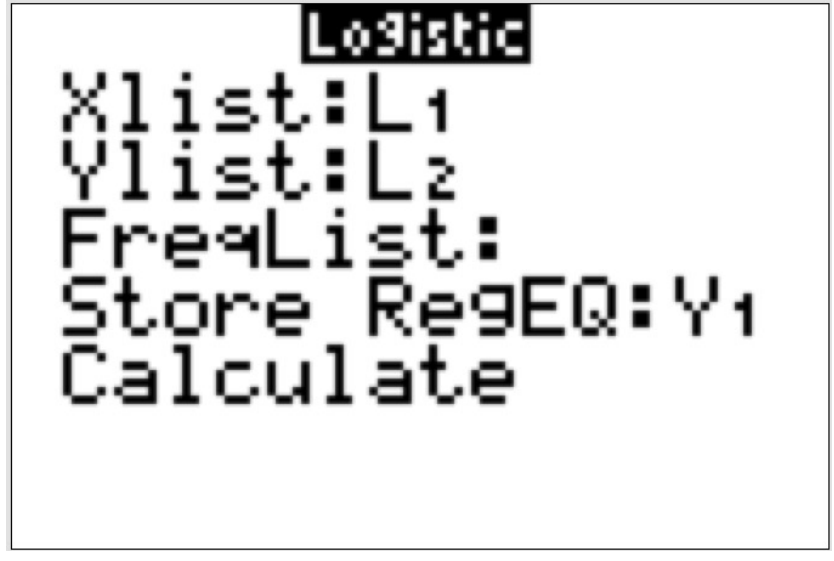
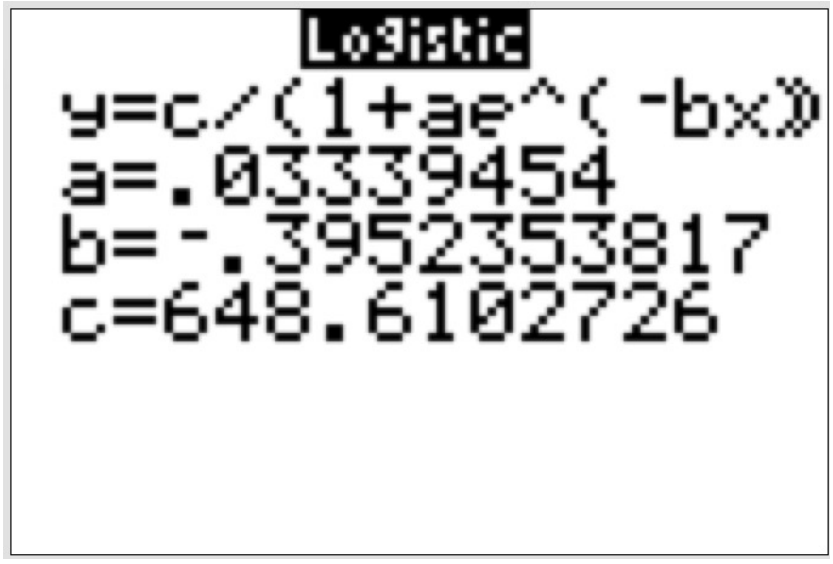




Press **ENTER**,



The model will appear on screen, and the formula for the model will be in the Y1 spot under y=.



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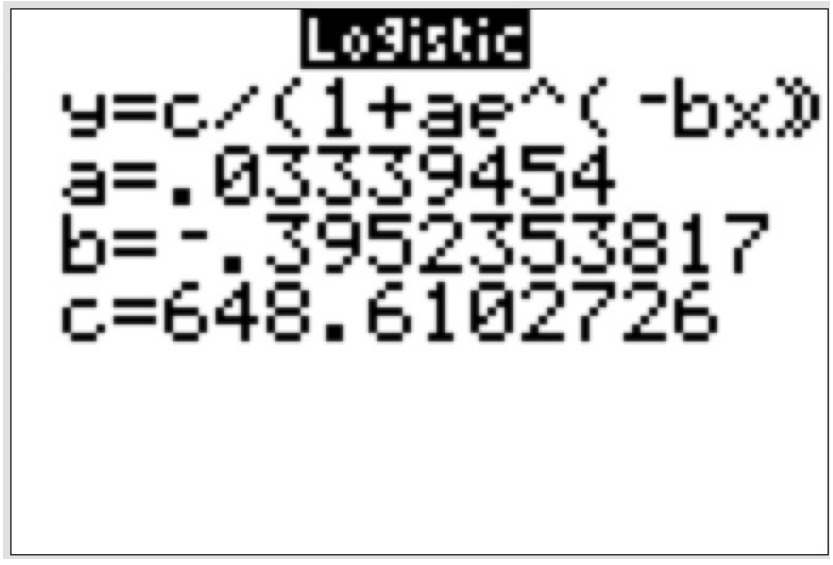

Answer to Question (a):

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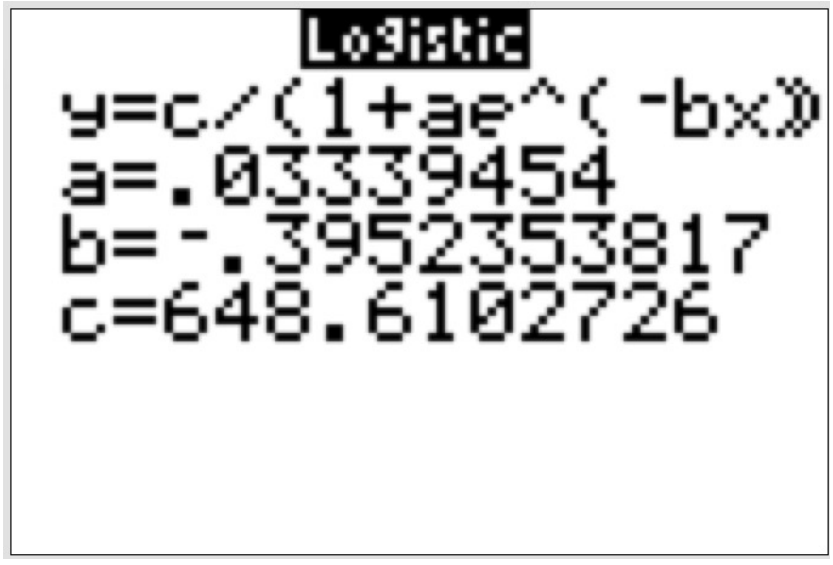
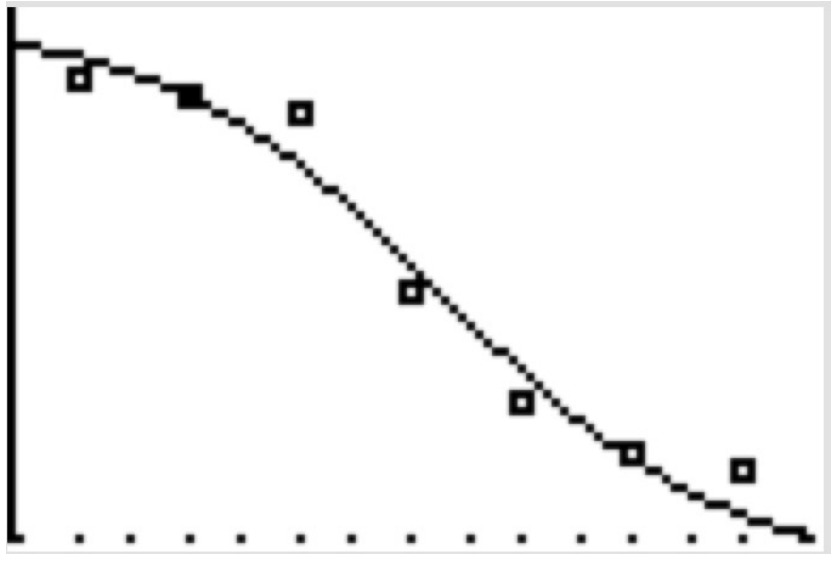


Answer to Question (a):

$f(x) = \dfrac{c}{1 + a \cdot e^{-bx}}$ thousands per month.

$a = 0.033$, $b = -0.395$, $c = 648.610$

Press ZOOM, press 9 to see how the model fit the data.(not for the question)



(b). According to the model in part (a), how many laptops are sold in the 7 months? in the 11 months? Round to 1 laptop.

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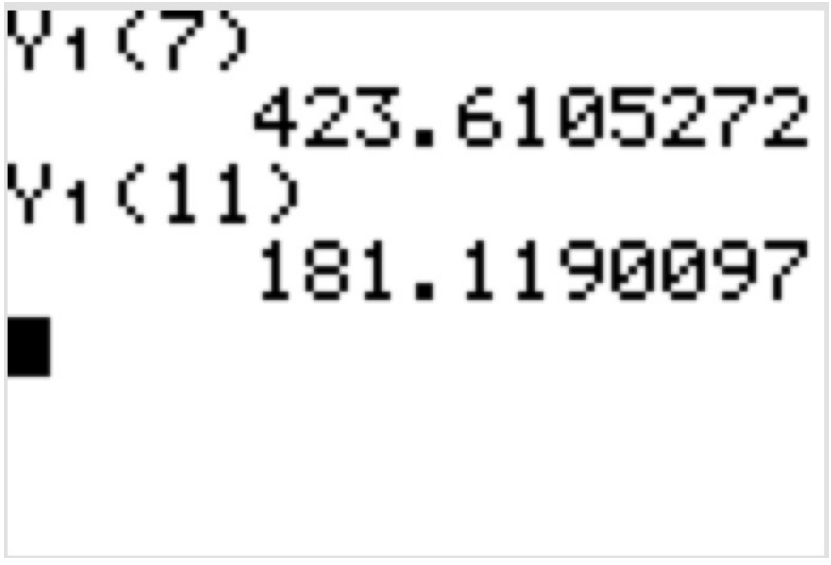

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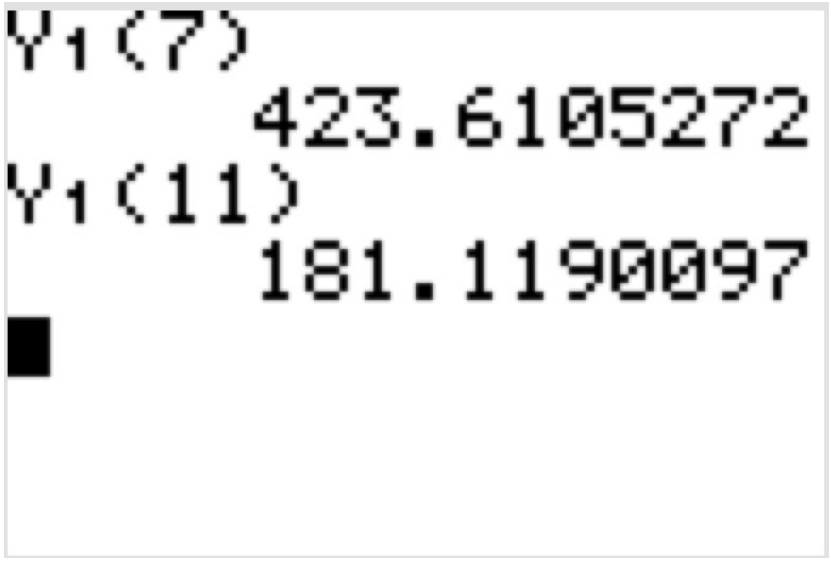

Answer:
$f(7) = 423.611$ thousands per month.
$f(11) = 181.119$ thousands per month.

(c). Use the model in part (a) to approximate the *average rate of change* of laptops sold per month between the 7 months and the 11 months.

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Answer:

$$\frac{f(11) - f(7)}{11 - 7} = \frac{181.119 - 413.611}{4} = -60.623$$

Youtube link for these two examples

For Example 1:

Step A, https://www.youtube.com/watch?v=7bVsqdZuDvo
Step B, https://www.youtube.com/watch?v=tgU4BiZsKyQ
Step C, https://www.youtube.com/watch?v=_nSuDd905bs
Step D, https://www.youtube.com/watch?v=F0tEorWgSYo

For Example 2:

Step A, https://www.youtube.com/watch?v=zS4WgTx4LRU
Step B, https://www.youtube.com/watch?v=1JGlVJRO_x8
Step C, https://www.youtube.com/watch?v=8rQu9MR7lps

Example 2. The following data shows a company spending on marketing in these years. Show work and give **units** for each answer.

year	2008	2009	2010	2011	2012	2013	2014
Spend(million$)	23.07	24.47	26.21	30.36	38.31	46.38	57.96

(a). Let x stand for the number of years since 2007, and let $g(x)$ stand for the money spending on market in millions. Fit **the best model** to the data. Round all coefficients to 3 decimal places.

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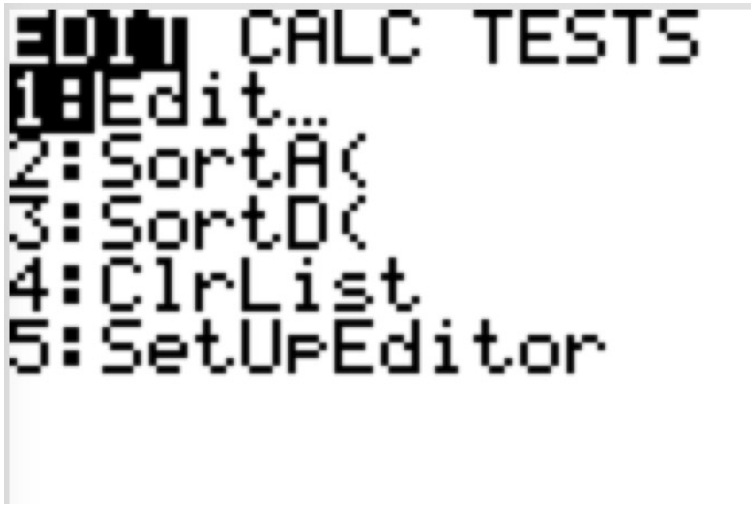
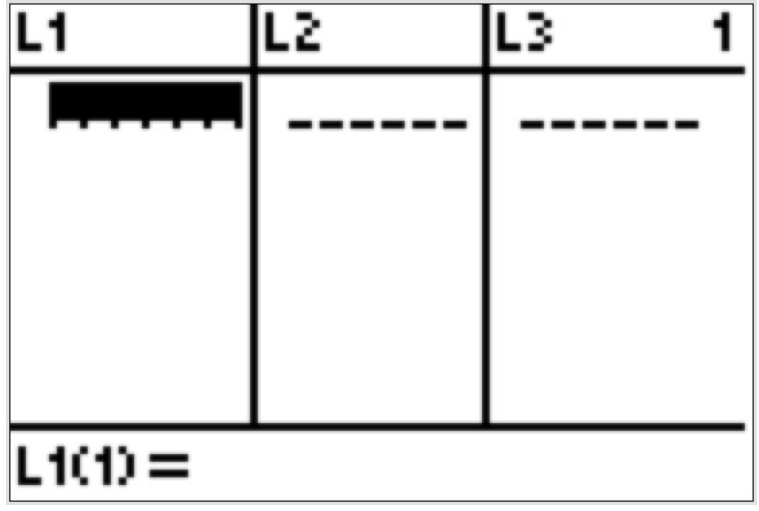
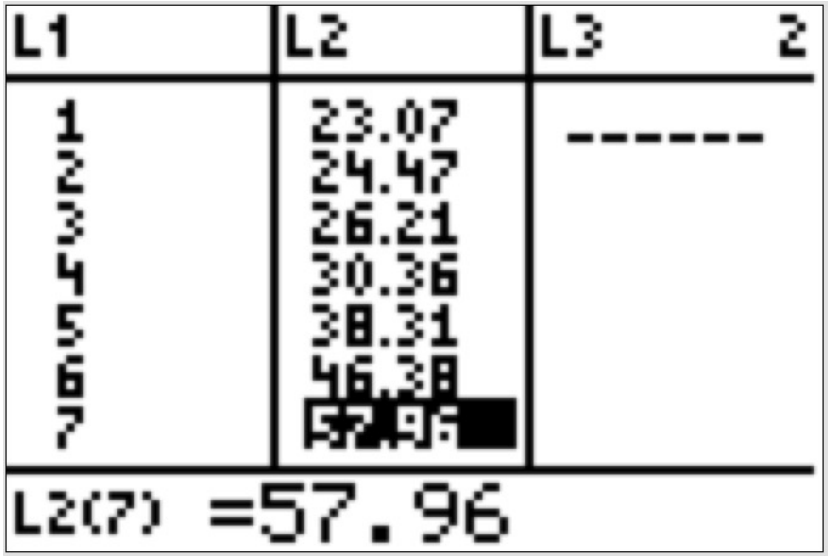
(a). Let x stand for the number of years since 2007, and let $g(x)$ stand for the money spending on market in millions. Fit **the best model** to the data. Round all coefficients to 3 decimal places.
Entering data on the TI84: Press **STAT** then press **ENTER** (or press 1)

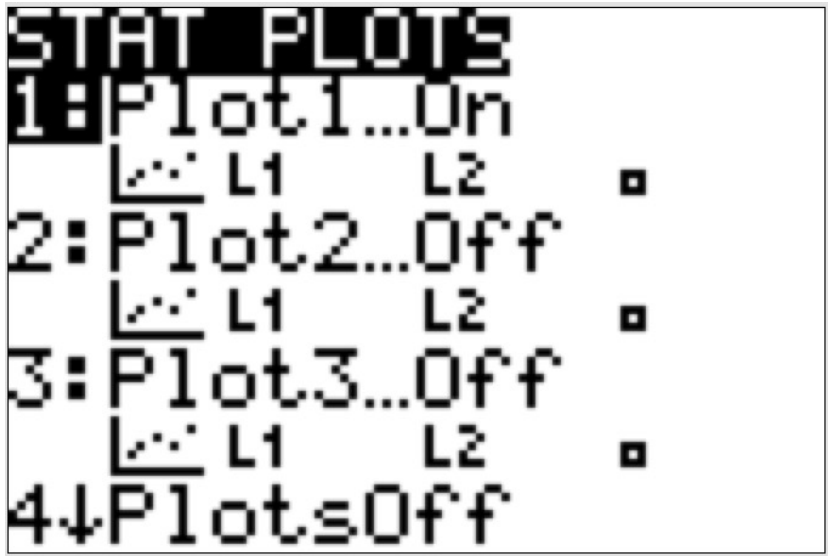


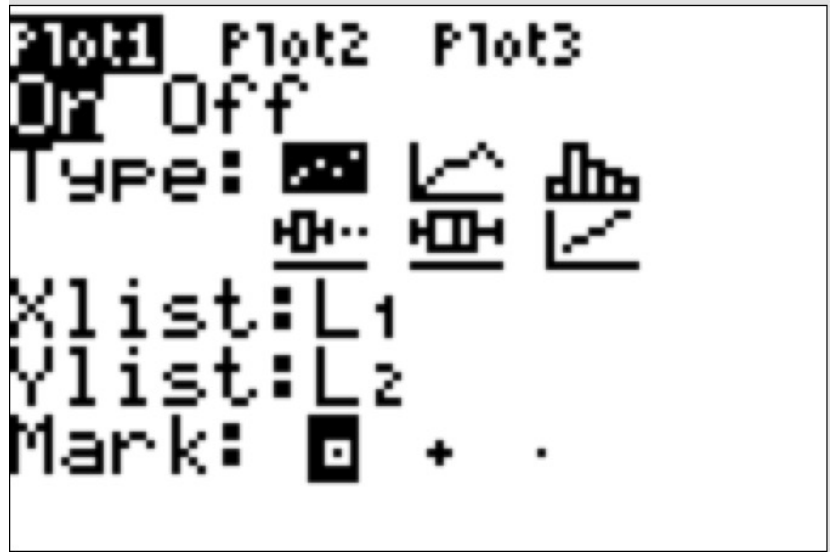


Enter data in **L1** and **L2**. Press **Y=**. Press **Clear**.



Press **2nd**. Press **Y=**. (This gives STAT PLOT) then **ENTER** (or 1).

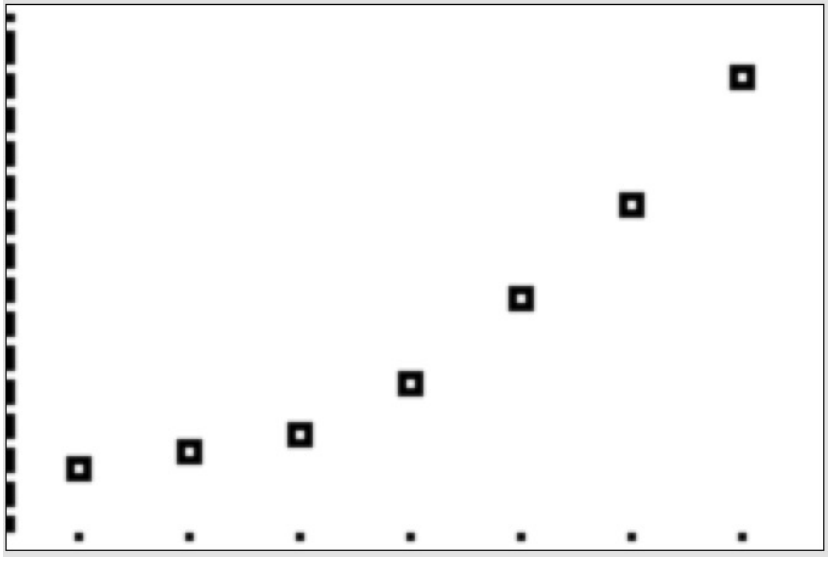




Make sure that **PLOT1** is **ON**. Make sure **X List** is set to **L1** and **Y List** is set to **L2**.

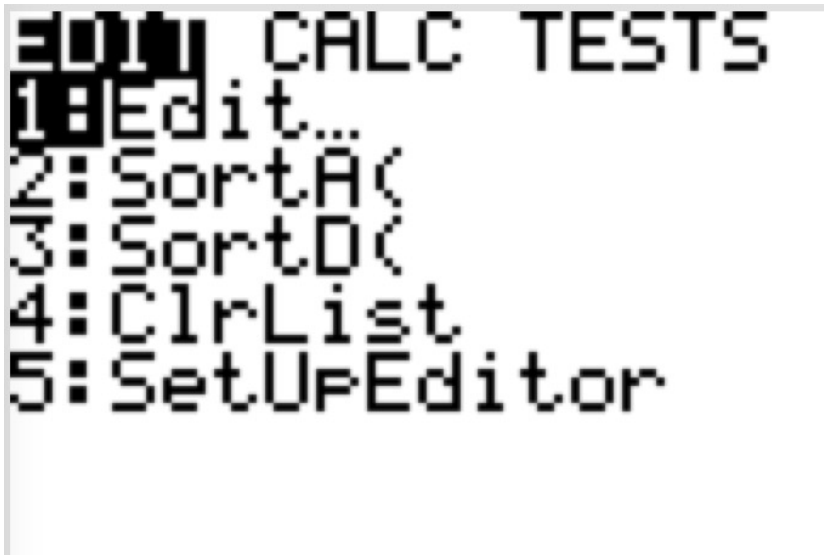
Press **ZOOM**.

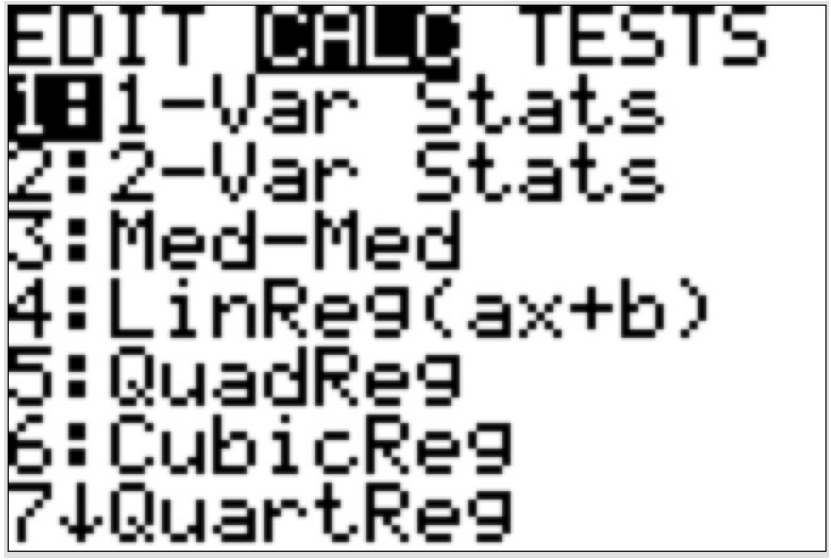
Press **9**.



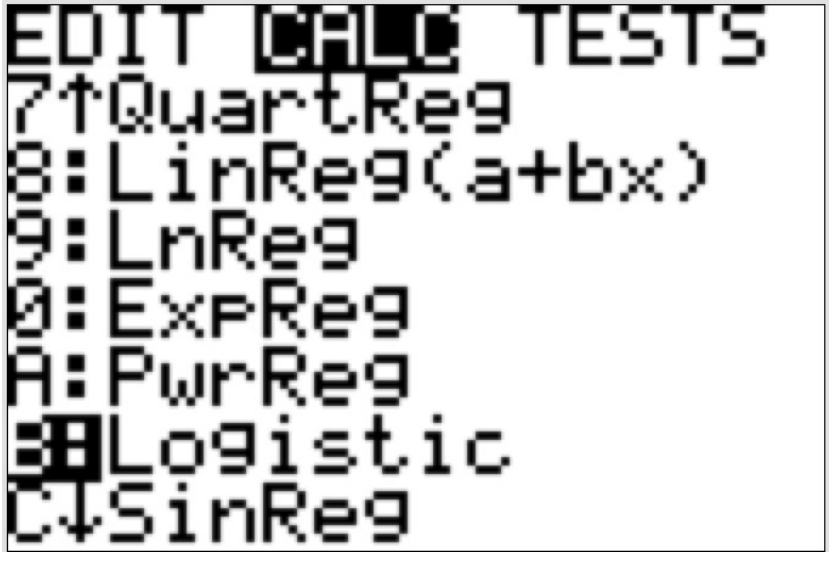
Exponential model

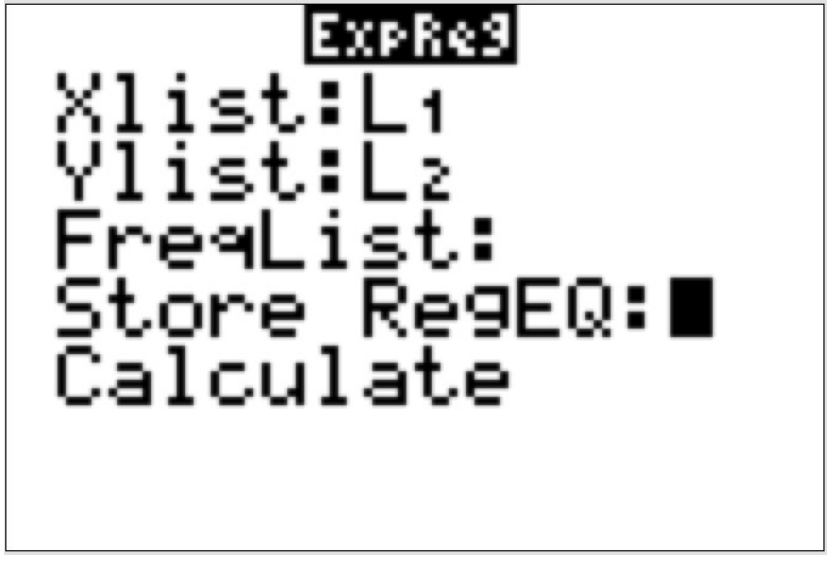
Press **STAT** then Press $\rightarrow$ (**right** arrow button)





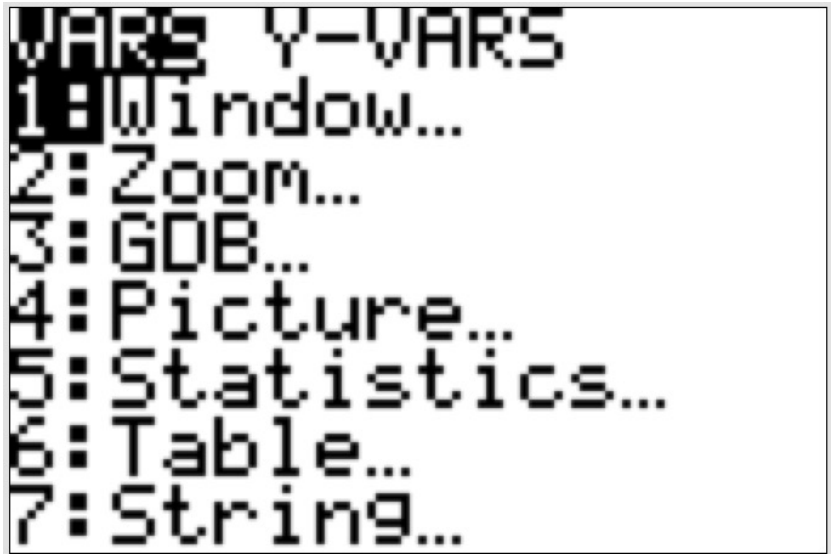
Find 0 ExpReg

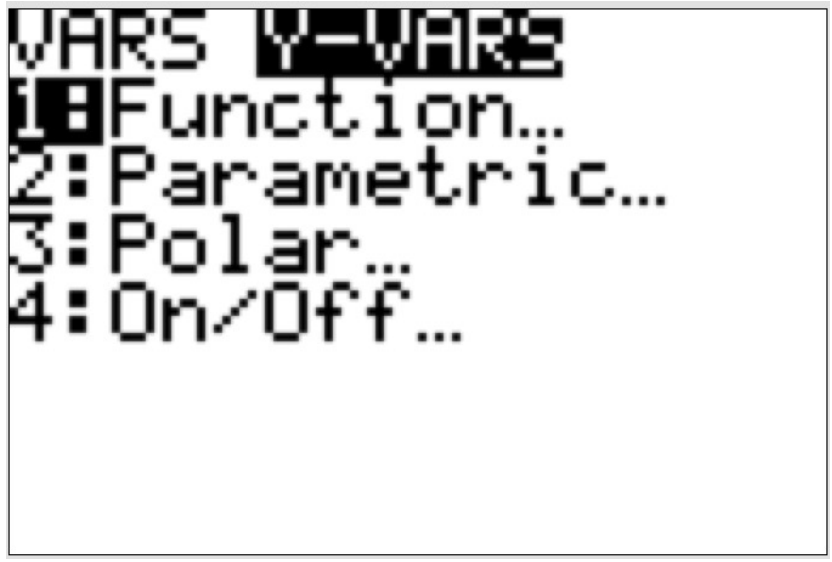




For TI-83(plus) calculator: ExpReg (L1,L2,Y1)

Press **VARS** then press $\rightarrow$ (**right** arrow button) (**Y-VARS**)





Press **ENTER**,

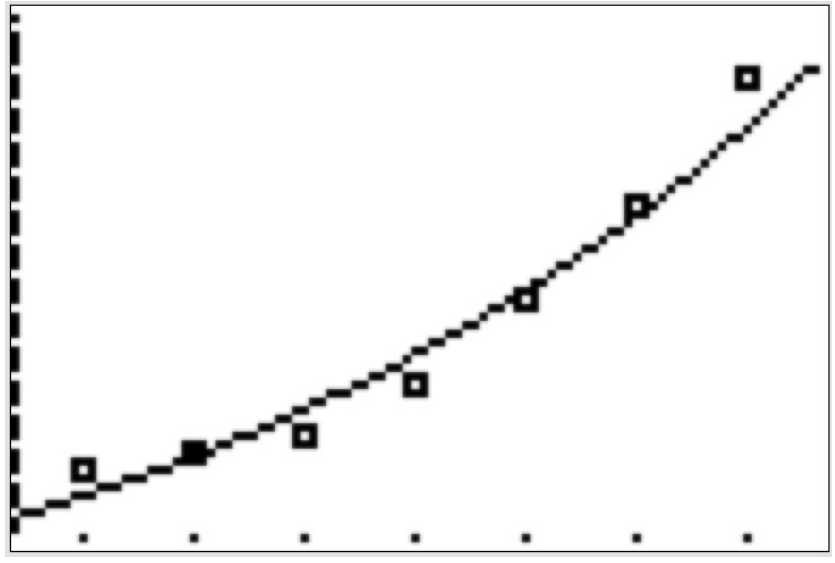
The model will appear on screen, and the formula for the model will be in the Y1 spot under y=.

Answer to Question (a):

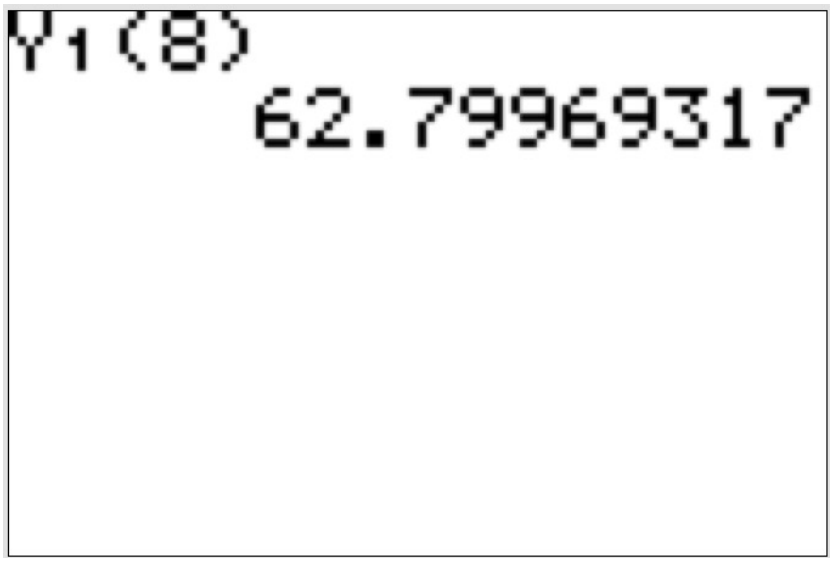
$g(x) = a \cdot b^x$ million dollars.

$a = 17.752,\ b = 1.171$

Press ZOOM, press 9 to see how this function fit. (Not for question)



(b). Use the model in part (a) to estimate the company spending on market in millions in 2015.



Answer:

$g(8) = 62.800$ million dollars.