

TI Technology Guide for *Breast Cancer Risks*

TI-83 Plus and TI-83 Plus Silver Edition

Creating Lists of Data, Displaying the Graph, Using the Regression Capabilities of the Handheld, Using the Equation Solver

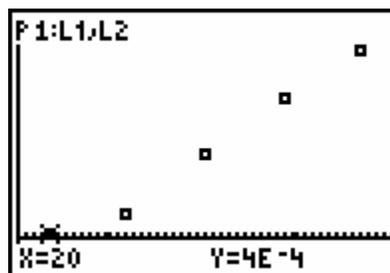
Press **[STAT]** and select **1:Edit** to access the List Editor window. Be sure to clear any existing data in the lists by highlighting the list name, then pressing **[CLEAR]** **[ENTER]**.

L1	L2	L3	1
-----	-----	-----	
L1(1)=			

Move the cursor to the first data position in L1 and enter the ages from the “Breast cancer risks” graphic. Move the cursor to the first data position in L2 and enter the corresponding risk factor values.

L1	L2	L3	2
20	4E-4	-----	
30	.004		
40	.0149		
50	.0254		
60	.0343		
-----	-----		
L2(6) =			

Press **[GRAPH]** to view the data. L1 (age) is on the horizontal axis, and L2 (risk factor) is on the vertical axis. To insure all the data points are visible, press **[ZOOM]** and select **9:ZoomStat**, which automatically adjusts the window. Press **[TRACE]** and use the arrow cursor keys to read the values of the data points.



To use the regression capabilities, press **[STAT]** **[>]** to access the CALC menu. Select Logistic, since the graph appears to most closely resemble a logistic function.

EDIT	TESTS
7↑	QuartReg
8:	LinReg(a+bx)
9:	LnReg
0:	ExpReg
A:	PwrReg
▢	Logistic
C:	SinReg

At the blinking cursor, press

$\boxed{2\text{nd}} \boxed{\text{STAT}} \mathbf{1: L1} \boxed{\text{ENTER}}$

$\boxed{\cdot}$ (above the $\boxed{7}$)

$\boxed{2\text{nd}} \boxed{\text{STAT}} \mathbf{2: L2} \boxed{\text{ENTER}} \boxed{\cdot}$

$\boxed{\text{VARS}} \mathbf{\triangleright} \boxed{\text{ENTER}}$ to display the VARS Y-VARS FUNCTION secondary menu, and then press 1 to select **1:Y1**.

L1, L2, and Y1 are pasted to the home screen as arguments to the logistic function.

```

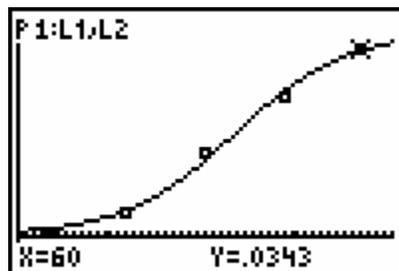
Logistic L1,L2,Y
1
  
```

Press $\boxed{\text{ENTER}}$ to execute. The logistic regression for the data in L1 and L2 is calculated. Values for a, b, and c are displayed on the home screen. The logistic regression equation is stored in Y1.

```

Logistic
y=c/(1+ae^(-bx))
a=479.1665443
b=.1408166298
c=.0373854289
  
```

Press $\boxed{\text{GRAPH}}$. The regression line and the scatter plot are displayed simultaneously.



Press $\boxed{\text{TRACE}}$ and use the arrow cursor keys to display the coordinate values.

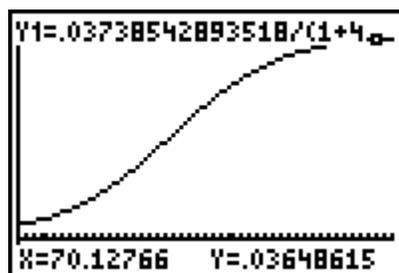
Press $\boxed{\text{Y=}}$ to view the equation. Notice that Plot 1 is highlighted, which indicates that the data points for L1 and L2 are showing on the graph. The = beside Y1 is also highlighted, which indicates that the function determined by the regression capabilities is also showing on the graph. Pressing $\boxed{\text{ENTER}}$ when the cursor is in either of these highlighted areas acts as a toggle to turn on or off the display of that component on the graph.

```

Plot1 Plot2 Plot3
\Y1=.03738542893
518/(1+479.16654
429413e^(-.14081
662982909X))
\Y2=
\Y3=
\Y4=
  
```

Turn off Plot1 and keep just the Y1 logistic function.

Press $\boxed{\text{GRAPH}}$, then $\boxed{\text{TRACE}}$, and use the arrow cursor keys to find the unknown values to answer the focus questions.



You may also use the Equation Solver to find the unknown values for the focus questions.

To access the solver, press **MATH** and select **0:Solver**. Since the solver places all variables on one side of the equal sign with the total value of 0, you need to enter the unknown value of Y and subtract Y1. Press

ALPHA **[Y]** **[-]** **VAR** Y-VARS, **1:Function**, **1:Y1**.

Press **ENTER** and insert the value for the known value (X or Y) then clear the value beside the unknown value in the question.

Press **ALPHA** **[SOLVE]** to solve for the unknown. Both the X and Y values are displayed. Repeat for the solution to the other questions.

```
EQUATION SOLVER
eqn: 0=Y-Y1
```

```
Y-Y1=0
Y=
X=70
bound= (-1E99, 1...
```

```
Y-Y1=0
Y=.03647023511...
X=70
bound= (-1E99, 1...
```