# "It's *Knot* the Slope!"
## An Algebra Activity with the *fx*-9750G PLUS

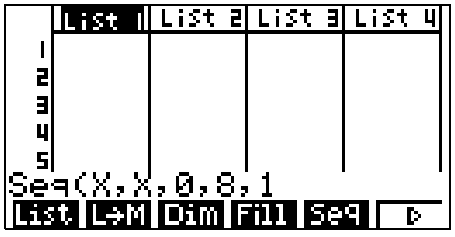
**We often find it difficult to find activities for our students with real data that will generate a scatterplot with a linear regression that has negative slope. I have adapted the following activity from one I participated in at a workshop recently.**

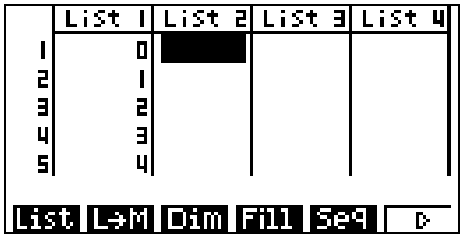
**Materials: Each group will need one piece of rope about a meter long, one meter stick and one calculator per student.**

Have the students measure the rope to the nearest tenth of a centimeter and record their data in the following table beside 0 knots. Tell them to tie one knot in the rope, measure the rope to the nearest tenth of a centimeter and record the data beside 1 knot. Have them continue until there is data for 8 knots.

| Number of Knots | Length of Rope |
|---|---|
| 0 | |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

Tell them to enter their data in the calculator. From the main menu, select STAT. To delete old data in the lists, highlight the list name (List 1), press F6, then F4 (DEL-A). A quick way to generate the number of knots list is to highlight the list name, press OPTN, F1 (LIST), F5 (Seq) X, X, 0 (start value), 8 (end value), 1 (pitch).

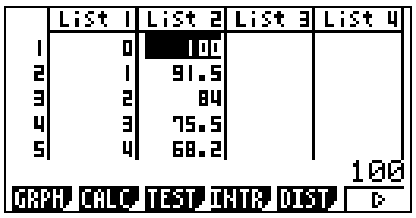


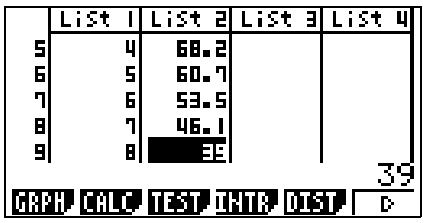




When the data has been recorded in the lists, ask one of the groups to share its data and enter it on the overhead display so that the whole class can work along with you. Tell the other groups to use their own data. It should all be close if they have the same size rope.

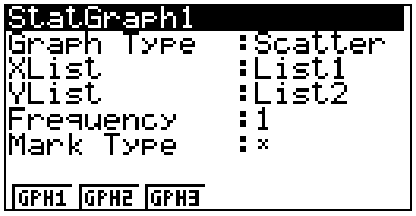
Vicki Phillips 2006

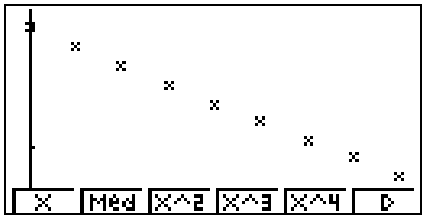
Sample data is used for the following screens.



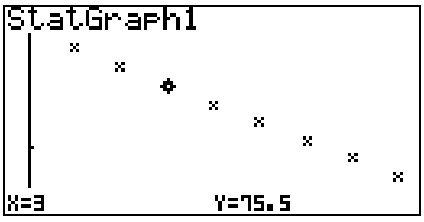




To draw the scatterplot, press F1 (GRPH), F6 (SET), F1 (GPH1). For Graph Type select F1 (Scat), XList is the number of knots list, YList is the length of rope list. Press EXE, F1 (GPH1) to view the scatterplot.



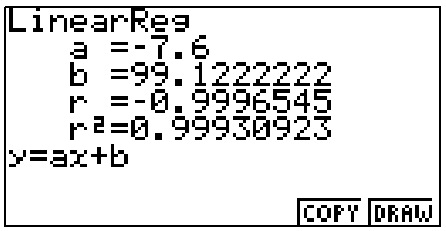

Press SHIFT F1 to trace along the plot.

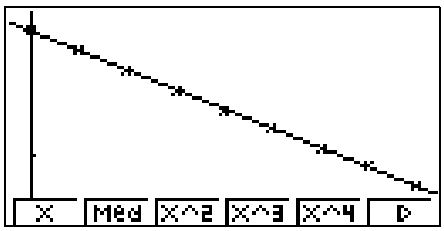



Pose the following questions to the class:

1. What do you think the slope of the line that would best fit the data might be? Why? What does the slope mean in this problem?
2. What is the y-intercept?
3. What would the equation of the line be?

Tell the students to press F1 and compare their equation with the linear regression equation. Press F6 to draw the line of best fit. Pose the following questions to the class:




1. Why was the slope of the line negative?
2. Explain what the slope means in your own words. (Give several students the opportunity to share.)