Linear Regression on the TI-Nspire
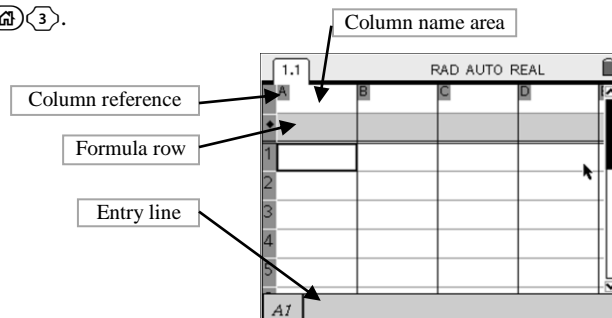
Name_____

The following table lists the winning times for the women's 100-meter sprint for several Olympics between 1948 to 2008. Follow the steps below to determine a best-fit line to model the data.

| Year	1948	1960	1972	1984	1996	2008
Winning Time (s)	11.9	11.4	11.1	11.0	10.9	10.8

1. Input the Data

    a. Open a new Lists and Spreadsheet page by pressing ⌂③.
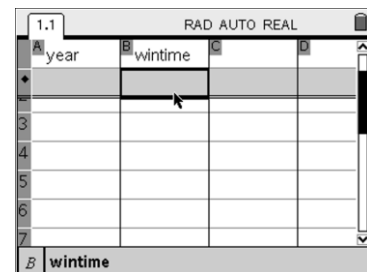

    b. Name the Columns:
- Name column A - arrow up to the cell containing the letter A, then use the green keys to type the word *year*. Press (enter).
- Name column B – arrow over to the cell containing the letter B, then type the word *wintime*. Press (enter).
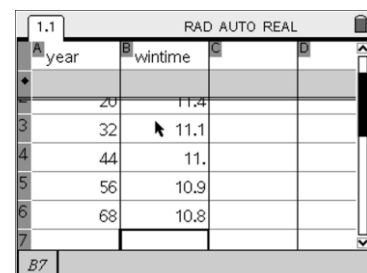

    c. Enter the Data:
- Enter the year values in column A starting at row 1 (let $x = 0$ represent 1940).
- Enter the times in column B.


2. Perform Regression

Open the Linear Regression dialog by pressing (menu)④①③. Press the down arrow on the NavPad to choose *year* for the *x* list. Press (enter) to select it. Press (tab) to move to the *y* list and then use the arrow to select *wintime*. Click on OK or press (enter) to execute the regression. Compare your results with the figure below.
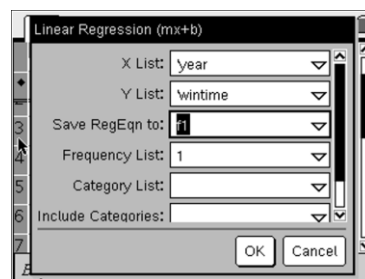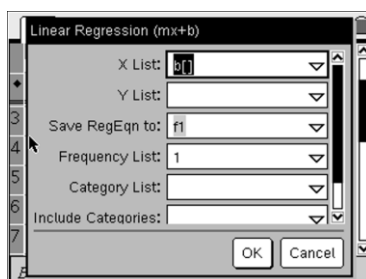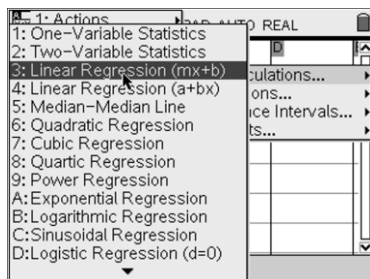
What is the equation of the regression line? (round to hundredths)

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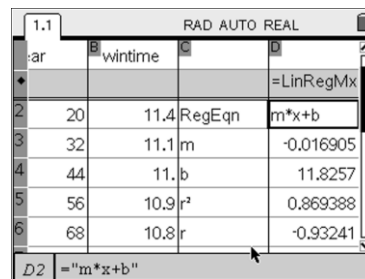
The regression process has automatically saved our equation into a variable called **f1**. We can now use this variable in any application within the same problem. To test it out, open a new Calculator page by pressing ⌂①. Suppose we want to predict the winning time in the 2016 Olympics using our equation. Type f1(76) and press ⏎. What is the predicted winning time?
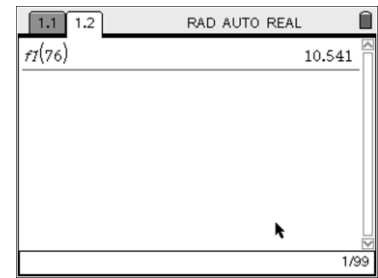
3. Create Scatter Plot

Open a new Graphs & Geometry page by pressing ⌂②. To view a scatter plot, we'll need to change the graph type. To do this, press ⓜ③④ (figure 2). We need to assign the *x* and *y* values of our scatter plot. Press the pointer to view the list of possible *x*-values. Arrow to *year* and press ⏎ select it. Press ⓣ to move to the *y* value. Again, press to view the list of possible *y*-values. Arrow to *wintime* and press ⏎ to select it (figure 3).

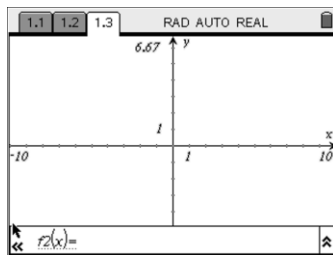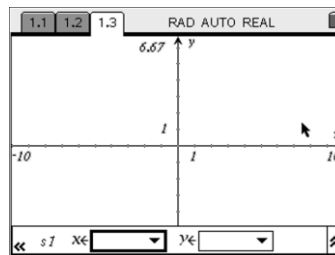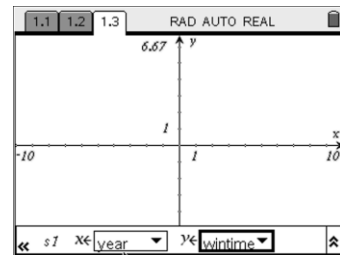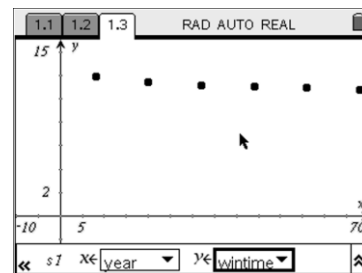| figure 1 | figure 2 | figure 3 |

We'll need to change the window to view the plotted points. To open Window Settings, press ⓜ④①. An appropriate window is given. You should see the scatter plot below.
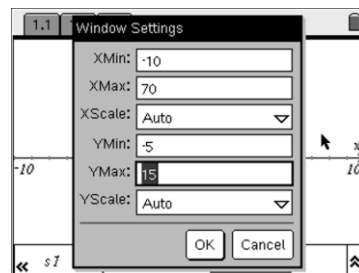
4. Graph Best-Fit Line

To graph the line along with our scatter plot, we first must change the Graph Type back to Function. Press ⓜ③① to do this. You will likely see *f2(x)=* in the entry line. Use the Navpad to arrow up to our function stored at *f1* (should look like figure 2). Finally, press ⏎ to graph the line (figure 3).
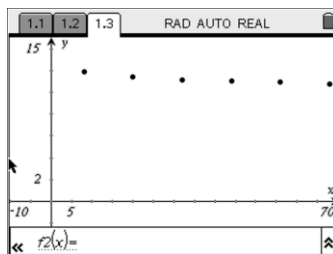
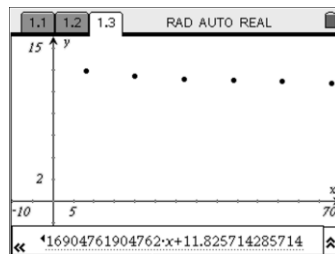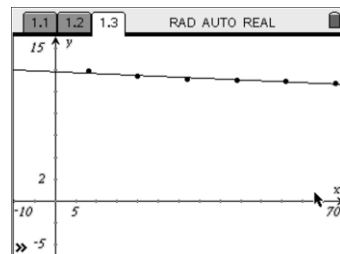| figure 1 | figure 2 | figure 3 |

How well does the line fit the data?