Warm Up 3/30/17

Reminders: Friday is STILL a school day, office hours after school today if you need help, Quiz on regressions next Tuesday, Test Friday of next week (if you are not going to be here I HIGHLY suggest taking it ahead of time)

Enter the following information into L1 and L2 of your calculator and see if you can get a line of best fit for the data (use linear regression)

Femur length (cm)	Height (cm)
50.1	178.5
48.3	173.6
45.2	164.8
44.7	163.7
44.5	168.3
42.7	165.0
39.5	155.4
38.0	155.8

Linear Regression

The idea

Our plan is as follows when given a set of data:

1.) Enter Data into your calculator

2.) Create a plot of the data that you can see on your graph

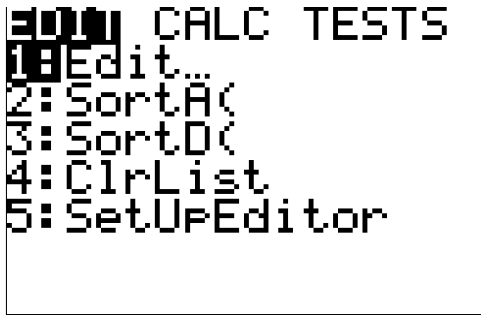
3.) find the linear regression, Correlation coefficient and store the equation in y1

4.) Graph the line and the data on the same graph

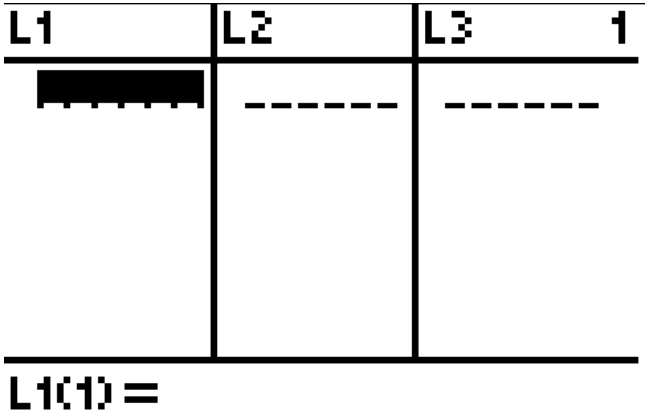
5.) using tools that you have make any inferences needed (predictions)

Enter Data into the calculator

1.) hit 'stat' then 'edit'



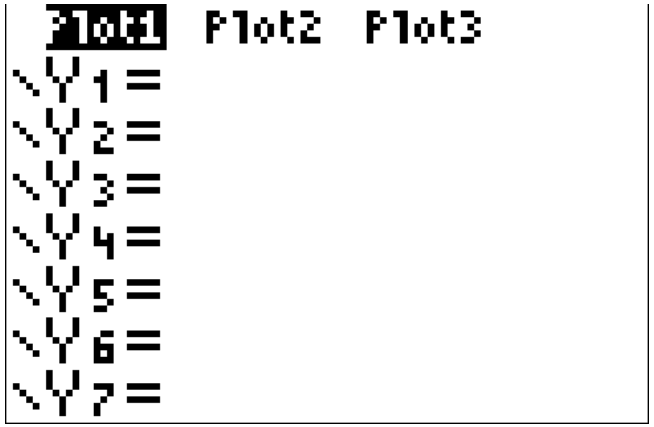
2.) enter data into L1 and L2, then quit out of the menu



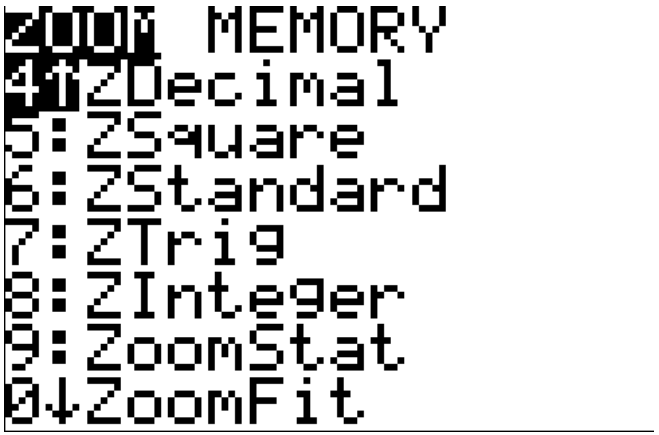
Femur length (cm)	Height (cm)
50.1	178.5
48.3	173.6
45.2	164.8
44.7	163.7
44.5	168.3
42.7	165.0
39.5	155.4
38.0	155.8

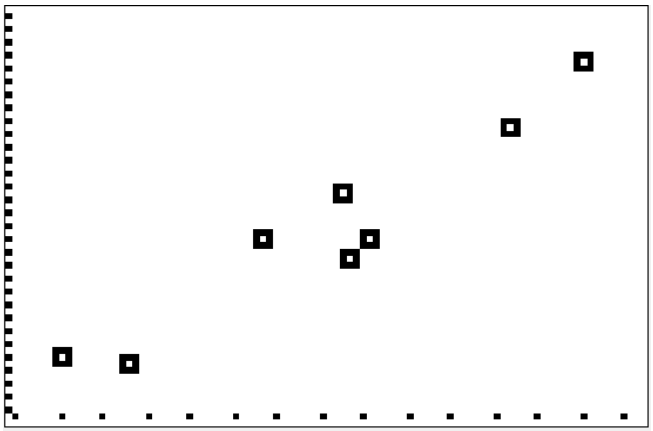
Create a Plot of the Data

1.) in y= turn on plot1 on the top of the screen by highlighting it and hitting enter



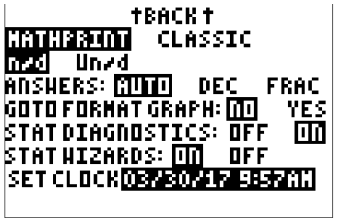
2.) To see all of the points hit 'zoom' and option 9:ZoomStat, this will allow you to see all points



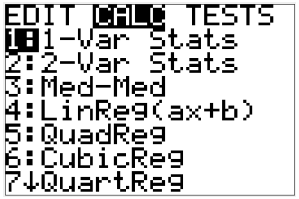


To get the regression and correlation coefficient

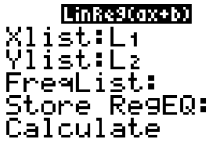
1.) make sure 'mode' is set to have 'stat diagnostics' set to on (only need to do this once)



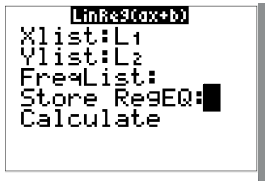
2.) go back to 'stat', go to the 'calc' menu and find 'linreg(ax+b)'

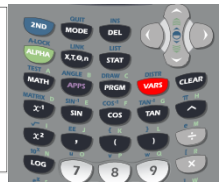


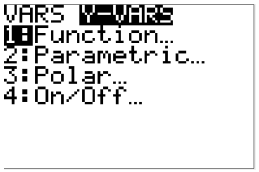
3.) Make sure L1 and L2 are input for the xlist and ylist.

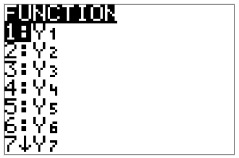


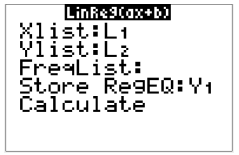
4.) Under 'store regeq' go to 'vars' then 'Y-vars' then 'function' hit Y1, then 'calculate', this will create the regression equation AND the correlation coefficient r and r^2 AND will store the equation in y1 for you.

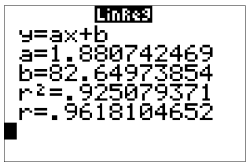






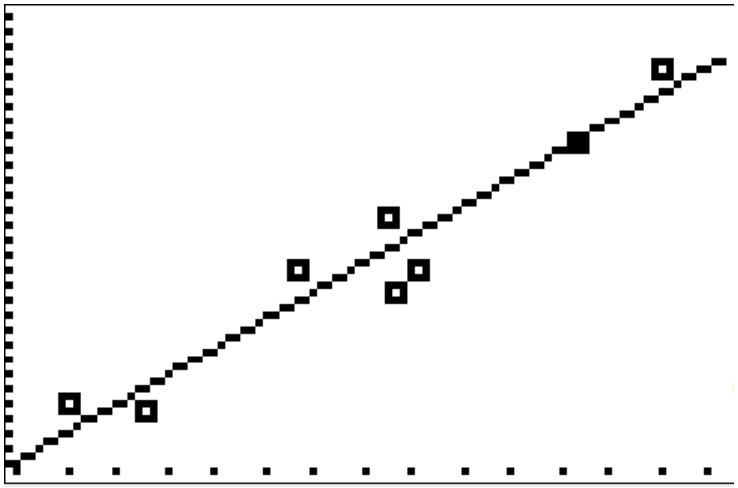






Graph the Equation and the data

1.) both data and equation should be in the calculator now and hitting 'graph' both should show up



Making inferences (predictions)

1.) given a set of data and after having found the linear regression identify what is being asked anduse your calculator to answer the question appropriately.

1. Anthropologists use a linear model that relates femur length to height. The model allows an anthropologist to determine the height of an individual when only a partial skeleton (including the femur) is found. In this problem we find the model by analyzing the data on femur length and height for the eight males given in the table.

Femur length (cm)	Height (cm)
50.1	178.5
48.3	173.6
45.2	164.8
44.7	163.7
44.5	168.3
42.7	165.0
39.5	155.4
38.0	155.8

a) Find and graph a linear equation that models the data.

$y=$ 1.8807x + 82.649

b) An anthropologist finds a femur of length 58 cm. How tall was the person?

what does it give an x or a y value?

What do you need to find?

Example

2. A convenience store manager notices that sales of soft drinks are higher on hotter days, so he assembles the data in a table, show below.

   a) Find and graph a linear equation that models the data.

   $y=$ _____

   b) Use the equation to predict soft drink sales if the temperature is $95^\circ\mathrm{F}$.

High Temperature ($^\circ\mathrm{F}$)	Number of Cans Sold
55	340
58	335
64	410
68	460
70	450
75	610
80	735
84	780