Chirp, Jump, Scatter

Name ________________________

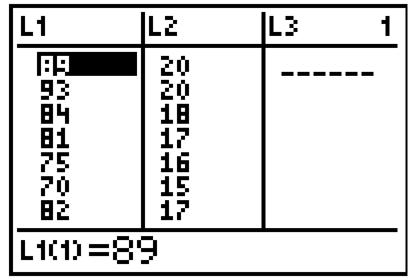
Class ________________________

Problem 1 – Chirps in 15 Seconds vs. Temperature

When looking at data, it is often difficult to see a relationship. However, when the data is plotted, a trend becomes clear. While real data rarely matches an equation perfectly, a line of best fit can be plotted to make predictions for future values.

Step 1: Run the program **SCATTER** and choose the first option **1: CHIRPS**.

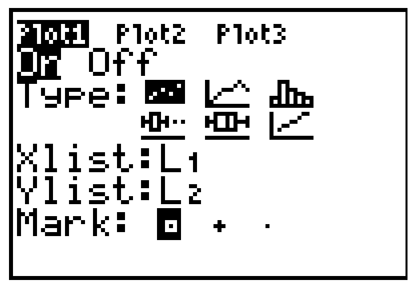
Look at the data of temperature, **L1**, (in °F) and the number of cricket chirps in 15 seconds, **L2**, in the Stat Editor by pressing [STAT] [ENTER].



- Is it easy to see a relationship between chirps and temperature by only looking at the data? Why or why not?

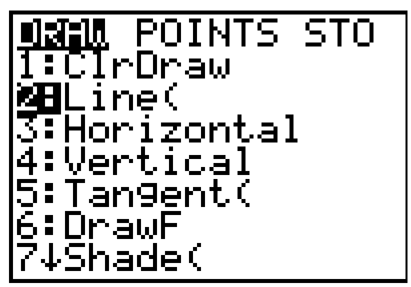
Step 2: Sometimes it is easier to see a relationship by observing a scatter plot of the data. To create a scatter plot, press [2nd] [STAT PLOT] [ENTER] and match the screen to the right.

Now press [ZOOM] and select **ZoomStat** to observe the scatter plot.



Step 3: To manually draw a line of best fit, press [2nd] [DRAW] and select **Line(**.

A cursor will appear in the middle of the screen. Use the arrow keys to place the first point near the start of the data. Press [ENTER] and record the coordinates to the nearest whole number below.

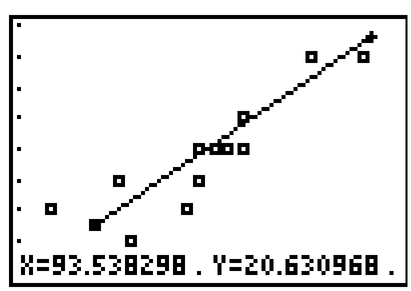


Point 1: *x*:________ *y*: ________

Move your cursor to the end of the data. Press [ENTER] and record these coordinates.

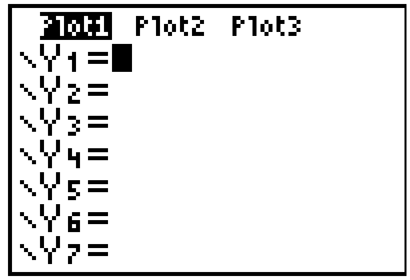
Point 2: *x*: ________ *y*: ________

The line should pass between most of the data.



- On the Home screen, use Points 1 and 2 to write an equation for your line.

Step 4: Press [Y=] and enter your equation next to **Y1**. Press [GRAPH] to verify that it passes through the data.

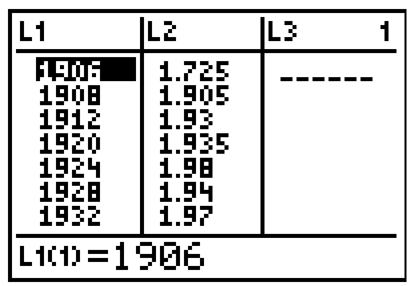


- Using the equation of your line of best fit, predict the number of chirps in 15 seconds you would expect to hear if the temperature was 100°F. How many chirps for 55°F?

Problem 2 – Olympic High Jump

Step 5: Run the program **SCATTER** and choose the second option **2: HIGH JUMP**.

Look at the data of years, **L1**, and the winning men's Olympic high jump height, **L2**, in the Stat Editor.

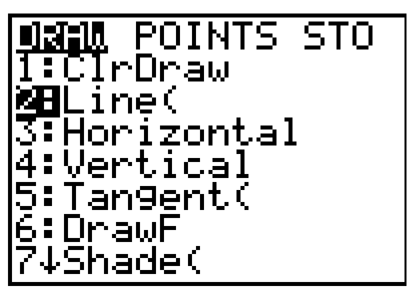


- By only looking at the data of high jump height for each year, can you see a general trend? Why or why not?

Step 6: Repeat the procedure for putting in a manual line of best fit as before.

Point 1: *x*:________ *y*: ________

Point 2: *x*:________ *y*: ________



- What is the equation of your line?

- Use this equation to predict the height of the high jump for the 2012 Olympics.

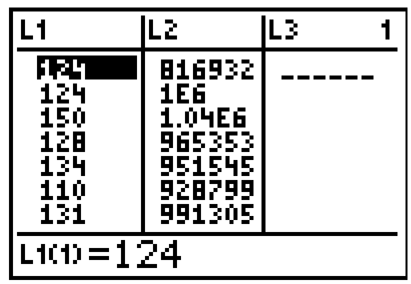
- Looking back at the data since 1988, does your prediction for the 2012 games seem realistic and reasonable? Why or why not?

Problem 3 – Brain Size and IQ

Step 8: Run the program **SCATTER** and choose the third option **3: BRAIN SIZE**.

Look at the data of IQ, **L1**, and the brain size, **L2**, in the Stat Editor.

Step 9: Create the scatter plot.



- By looking at the graph of Brain Size vs. IQ, does there appear to be a relationship between brain size and IQ? Change the variables on the axis. Does a relationship appear?

Extension

Problem 1 – Women's Olympic Discus Throw

Run the program **SCATTER** and choose the fourth option **4: DISCUS**. Look at the data of years, **L1**, and the distance of the discus throw, **L2**, in the Stat Editor.

- Find the equation of the line of best fit. Make a prediction for a future Olympic year and discuss its reasonableness.

Problem 2 – How many handshakes?

Below is a diagram of 3 and then 4 people in the room. If each person were to shake hands with every other person, how many handshakes would there be?

- Draw below what this would look like if there were 5 people in the room. How many handshakes would there be, if there were 6 people?

Using the graphing calculator, store the number of people in **L1** and the number of handshakes in **L2**.

- After creating the scatter plot, does this data look linear? What is the shape of this graph?