Part 1 – Creating the Original Image

In this activity, you are going to graph an image and then explore the impact of changing all the *x*-values by a certain amount or changing the *y*-values by a certain amount. Lists will be used to draw an image on the calculator screen.

1. Write the coordinates all of points on the original tree.

A	(,)	H	(,)	O	(,)
B	(,)	I	(,)	P	(,)
C	(,)	J	(,)	Q	(,)
D	(,)	K	(,)	R	(,)
E	(,)	L	(,)	S	(,)
F	(,)	M	(,)	A	(,)
G	(,)	N	(,)		

2. How do you think we can make the tree taller? _____

_____

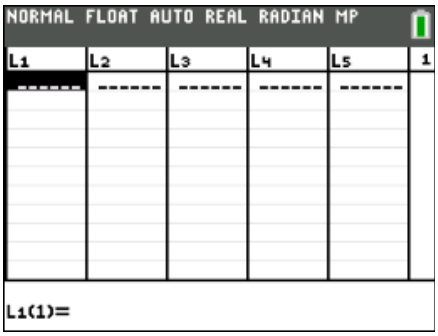
3. How do you think we can make the tree shorter? _____

_____

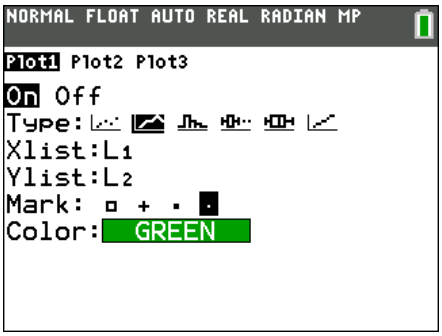
4. What do you think would happen if we doubled all the *x*-coordinates? _____

_____

5. Now enter the coordinates above as L1 and L2. All *x*-values are entered (in order) in L1. The *y*-values are entered (in order) in L2. Press [STAT] and select **1:Edit…** to open L1 and L2.



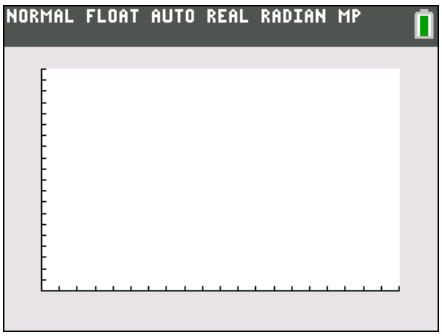
To setup the STAT PLOT press [2nd] [STAT PLOT] and configure as shown.



Work with your teacher to select an appropriate Window. Press [WINDOW] to change the values.

Press [GRAPH] to view the tree.

Draw the tree as best you can at the right.



Part 2 – Changing *x*-values

6. First, let's change the *x*-values by doubling all the numbers. To do this, press [STAT] and select **1:Edit…**, and then move to the top of L1. Then, press [2nd] [LIST] [1] to select L1, [×] [2] to multiply by 2, and [ENTER] to execute the command. How did all the values in the list change?

_____

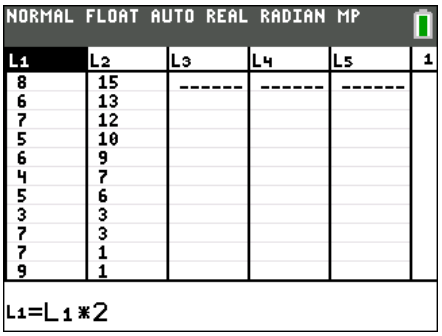
7. Predict how the graph of the tree will change.

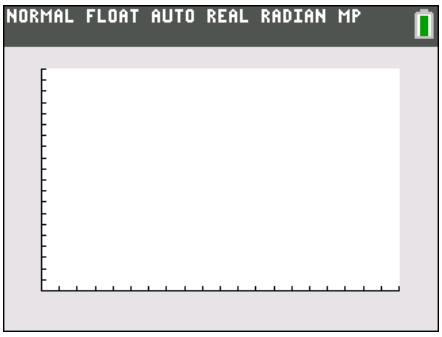
_____

8. Press [GRAPH] to see the new tree. Draw it at the right.

9. If your prediction in Question 7 was not correct, how did the graph change?

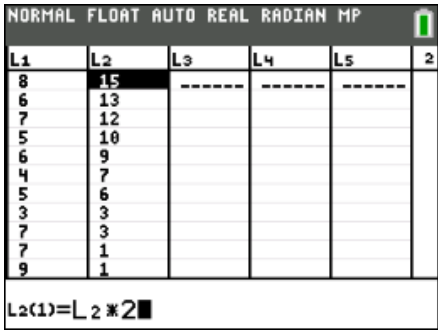
_____

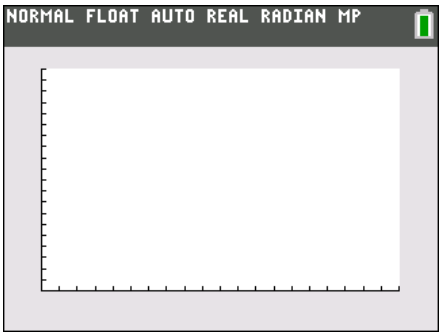




Part 3 – Changing *y*-values

Before changing the *y*-values of the original tree, you must change the *x*-values back to original values. You will need to divide the list by 2. Follow the same procedure in Question 6 except divide by 2. Then, multiply the *y*-values by 2. Again, use the same procedure as in Question 6.





_____

10. Predict how the graph of the tree will change.

_____

11. Press GRAPH to see the new tree. Draw it at the right.

12. If your prediction in Question 10 was not correct, how did the graph change?

_____

13. If you divide the original lists by 2, what do you predict will happen? _____

_____

14. How would you make the tree both taller and wider? _____

_____