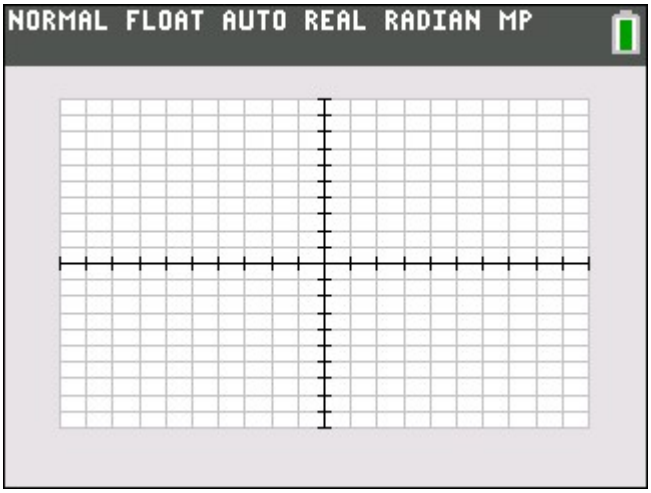
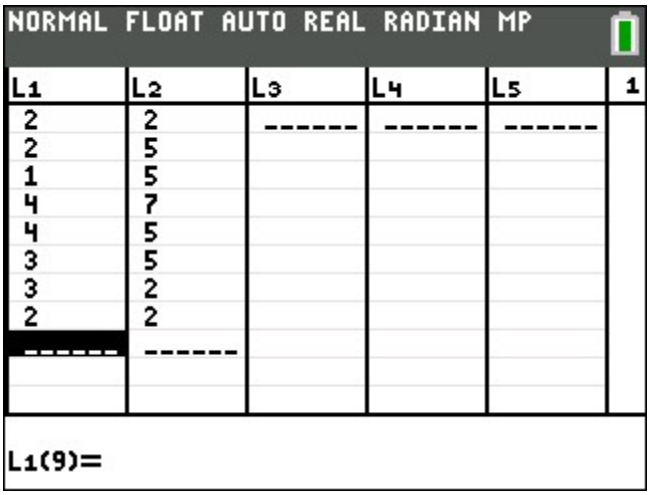
Translations, Reflections, Rotations:
Transformational Fun on TI-84 CE Calculators

Plotting Points and Ordered Pairs:

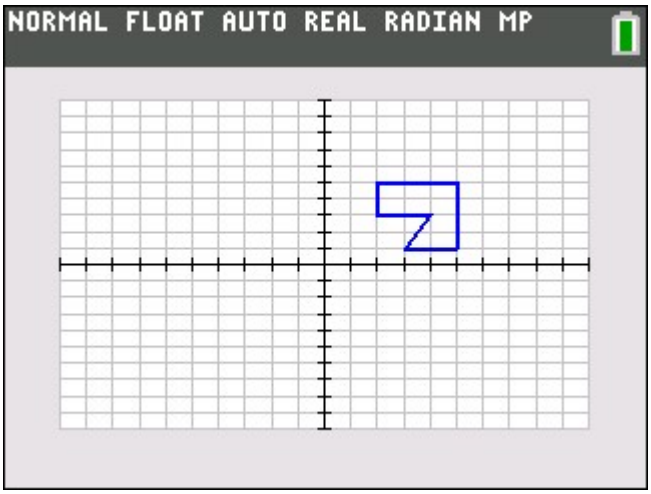
1. Plot the points identified on the graph provided using the ordered pairs in the table. Connect the points in the order listed. The values in $\mathbf{L_1}$ represent the x-coordinate and the values in $\mathbf{L_2}$ represent the y-coordinate for each ordered pair.

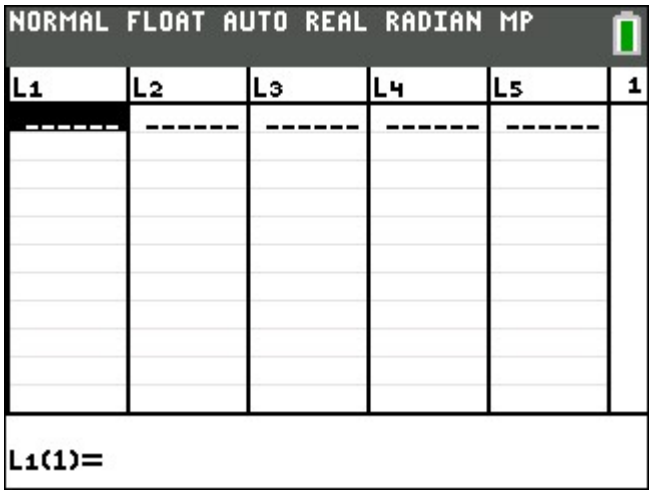




Check your work by entering the values from the list into your calculator and graph using **STAT PLOT**.

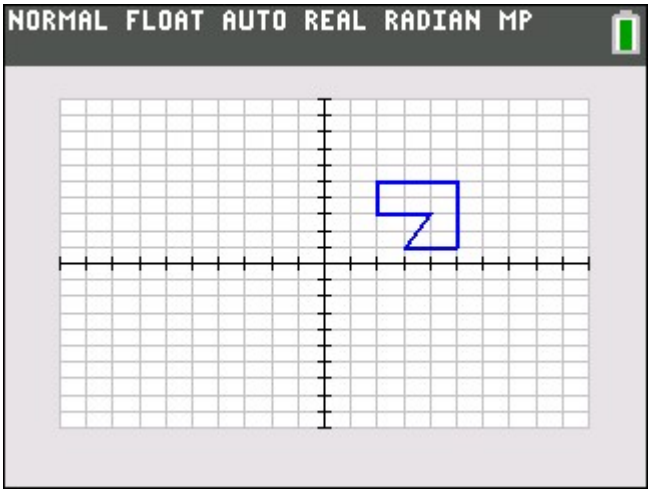
2. Identify the 7 points that were used to create the image below and record each ordered pair on the chart below. Place the x-coordinate in $\mathbf{L_1}$ and the y-coordinate in $\mathbf{L_2}$.
   HINT: points are formed by the intersection of two segments.

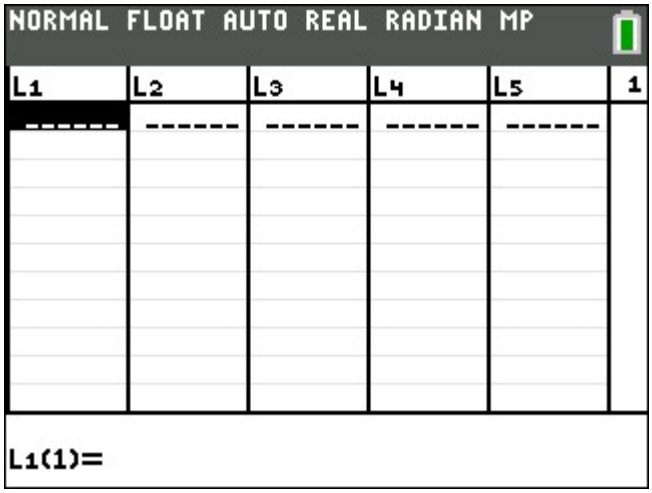


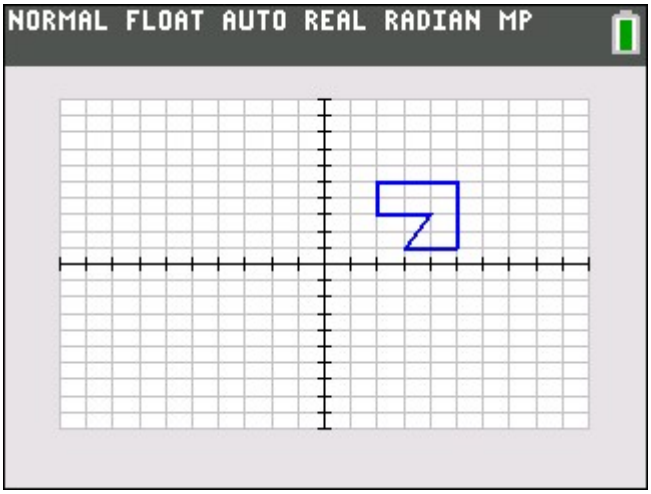


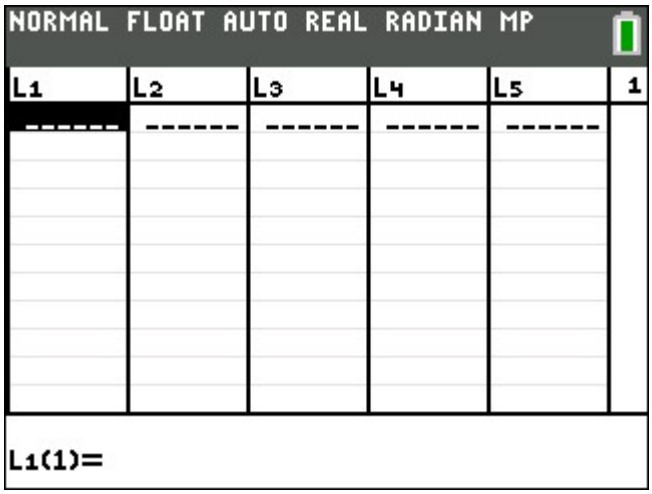
Check your work by entering the values from the list into the calculator and graph using **STAT PLOT**.

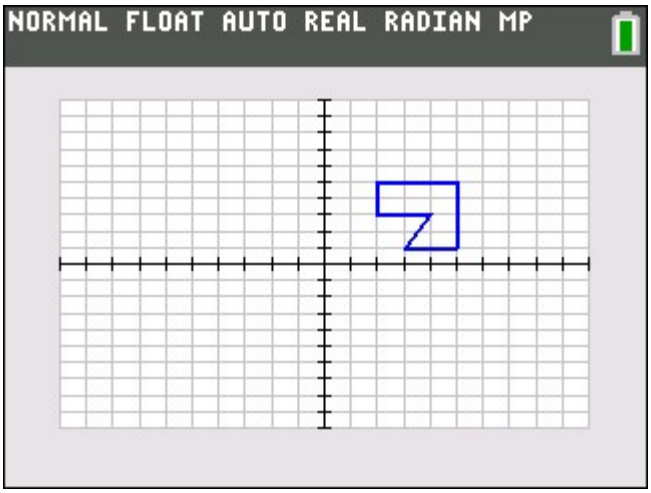
Activity created by Valerie Roebuck, T^3 Regional Instructor.

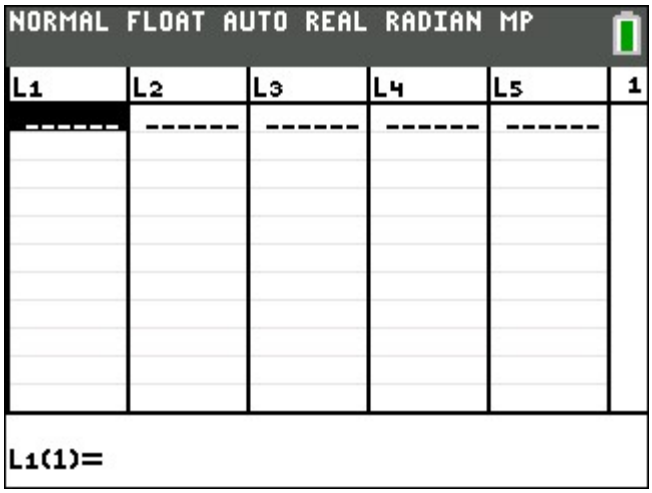












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Translations:

3. Imagine that you translate the image in problem 2 on the previous page six units to the left. What effect would that have on the x-coordinates? _____
   On the y-coordinates? _____
   Write the algebraic formula that would be used to change the x- and/or y-coordinates when translating the image six units to the left. _____

4. Check your work by entering the formula into **L_3** and graph using **Plot2**. What list will be used for the **XList**? _____ for the **YList**? _____

5. Now imagine that you translate the original image in problem 2 down seven units. What effect would that have on the x-coordinates? _____
   On the y-coordinates? _____
   Write the algebraic formula that would be used to change the x- and/or y-coordinates when translating the image down seven units. _____

6. Check your work by entering the formula into **L_4** and graph using **Plot3**. What list will be used for the **XList**? _____ for the **YList**? _____

Reflections:

Before working this section, clear the data in L_3 and L_4 and turn off Plot2 and Plot3.

7. Imagine that you reflect the original image in problem 2 over the x-axis. What effect would that have on the x-coordinates? _____
   On the y-coordinates? _____
   Write the algebraic formula that would be used to change the x- and/or y-coordinates when reflecting the image over the x-axis. _____

8. Check your work by entering the formula into **L_3** and graph using **Plot2**. What list will be used for the **XList**? _____ for the **YList**? _____

9. Now imagine that you reflect the original image in problem 2 over the y-axis. What effect would that have on the x-coordinates? _____
   On the y-coordinates? _____
   Write the algebraic formula that would be used to change the x- and/or y-coordinates when reflecting the image over the y-axis. _____

10. Check your work by entering the formula into **L_4** and graph using **Plot3**. What list will be used for the **XList**? _____ for the **YList**? _____

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Rotations:

Before working this section, clear the data in L_3 and L_4 and turn off Plot2 and Plot3.

11. Imagine that you rotate the original image 90^0 counterclockwise around the origin. What effect would that have on the x-coordinates? _____
    On the y-coordinates? _____
    Write the algebraic formulas that would be used to change the x- and/or y-coordinates when rotating the image counterclockwise around the origin. _____

12. Check your work by entering the formulas into $\mathbf{L_3}$ and $\mathbf{L_4}$. Graph using **Plot2**. What list will be used for **XList**? _____ for the **YList**? _____

13. Now imagine that you rotate the original image clockwise around the origin. What effect would that have on the x-coordinates? _____
    On the y-coordinates? _____
    Write the algebraic formulas that would be used to change the x- and/or y-coordinates when rotating the image clockwise around the origin. _____

14. Check your work by entering the formula into $\mathbf{L_5}$ and $\mathbf{L_6}$. Graph using **Plot3**. What list will be used for **XList**? _____ for the **YList**? _____

Dilations:

Before working this section, clear the data in L_3, L_4, L_5, L_6 and turn off Plot2 and Plot3.

15. In the list editor, change the formula for $\mathbf{L_3}$ to =0.5*$\mathbf{L_1}$, and the formula for $\mathbf{L_4}$ to =0.5*$\mathbf{L_2}$. Predict the changes that will be made to the original image. Explain your thinking. _____
    _____
    _____

16. Check your work by turning on **Plot2** and graph using $\mathbf{L_3}$ for **XList** and $\mathbf{L_4}$ for **YList**.

17. What is an example of a formula that could be used to make the image larger? Explain your thinking. _____
    _____
    _____

18. Enter the formula into $\mathbf{L_5}$ and $\mathbf{L_6}$ then graph using **Plot3** to check your prediction.

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