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Function Families – Absolute Value

**Materials**

* TI 84 Calculator

**Activity (Step by Step)**

* Create two lists on your calculator.
  + Press STAT
  + Press 1: Edit
  + Clear L1 and L2 if Needed. (Highlight and press clear)
  + Under L1 type in all integers from -5 to 5.
  + Under L2 type the absolute value of what is in L1
* Ask students, “What do you think the graph will look like?” *This will give you an idea of whether students can picture what is going to happen before you actually graph L1 and L2.*
* Graph L1 and L2
  + Turn the Plot on
    - Press 2ND Stat Plot
    - Press 1: Plot 1
    - Highlight On and Press Enter
  + Press ZOOM
  + 9: ZoomStat
* Ask students, “What do you notice about the points?” “If we were to graph an absolute value function, what you do think that graph will look like?”
* Graph y = abs(x)
  + Press Y=
  + Press Math
  + Press the right arrow (>) so that NUM is highlighted
  + Press 1: abs(
  + Now abs( is in your Y=
  + Press the (X,T,,n) key
  + Press the closed parenthesis ) key
  + Press ZOOM
  + Press 6: ZStandard
* Tell students that this is an **Absolute Value Graph**. Tell students that the graph that they have on their screen now is called the **Parent Graph**. Anytime students have the absolute value of X, this is what the graph will look like. Tell students that just like a Parabola, an absolute value graph can be stretched, compressed, shifted horizontally, and shifted vertically.
* Give students the equation “Y= **a** abs(x-**b**) + **c**” where **a** stretches and compresses the graph, **b** shifts the graph horizontally, and **c** shifts the graph vertically.
* Keep Y1 as it is. Go to Y2 and manipulate the **a**, **b**, and **c** values one at a time, asking students what they think will happen before each parameter is manipulated. Do several examples of manipulating each parameter. Be sure to include fractions for the **a** parameter and negative values for all three parameters.