**Quadratic Quilt Workshop**
**Instructions**

We will begin by choosing binomials to multiply for our quilt. You can use the example given below, or choose your own binomials to multiply.

$$(x+3)(x-2) \qquad (\quad)(\quad)$$

| | x | -2 |
|---|---|---|
| x | $x^2$ | -2x |
| 3 | 3x | -6 |

| | | |
|---|---|---|
| | | |
| | | |
| | | |

$$x^2 - 2x + 3x - 6$$

*When we simplify we get the following quadratic:*

$$x^2 + x - 6$$

Once you have decided which 'quilt' you will be making (Fig. 1), assign each term a piece of fabric (Fig. 2.) Your fabric packet will have 4 small rectangles (the original binomials) and 4 large squares (the resulting polynomial). Be careful when assigning fabrics; like terms should have the same fabric.

| | x | -2 |
|---|---|---|
| x | $x^2$ | -2x |
| 3 | 3x | -6 |

*Fig. 1: Selected 'quilt'*

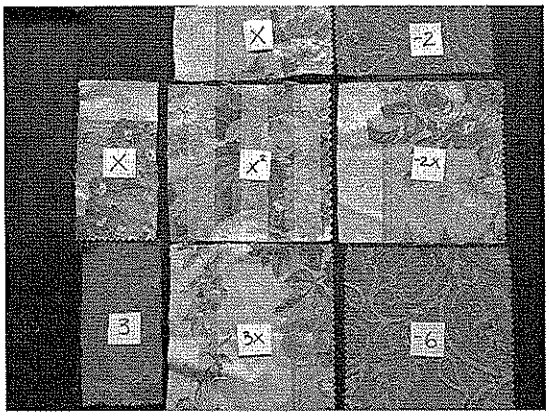



*Fig. 2: Assigning each term a fabric square*

After assigning a fabric square to each term, you may begin sewing. To get the neatest quilt, sew each row of fabric separately, then sew the rows together. This will create a seamless quadratic quilt square.

To sew two squares together, line them up with the side you want to see facing inward (Fig. 3.) Hold the squares in place using safety pins (Fig. 4); then sew them together. The resulting row will have the stitches and the seams on the back, leaving the front nice and seamless (Fig. 5.)

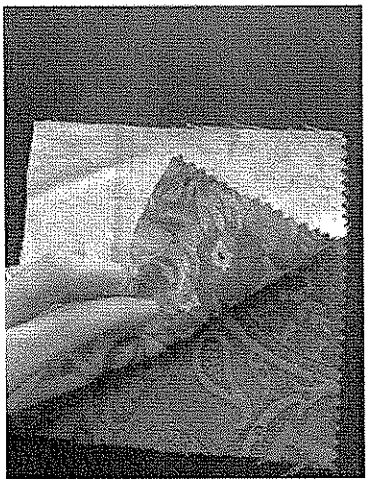


*Fig. 3: Fabrics facing each other*

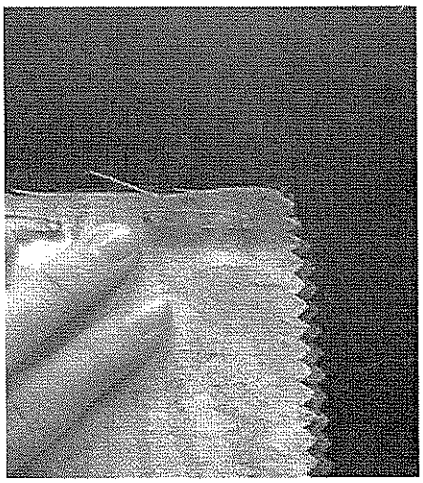


*Fig. 4: Safety pins hold squares in place*

*Fig. 5: A seamless row*

To sew two rows together, use the same method that you did with the individual squares (Fig. 6.) The resulting quilt may look raw with rough edges (Fig 7.) You can add detail by adding extra stitching around the edges to create a polished final product (Fig. 8.)

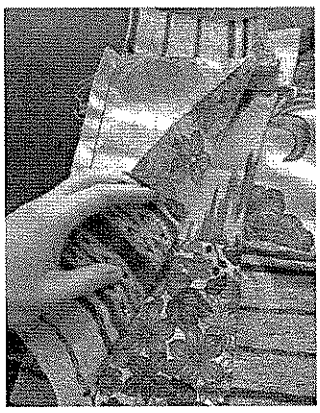


*Fig. 6: Sewing rows together*

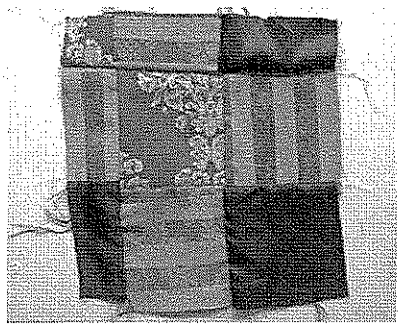


*Fig. 7: Raw-edged quilt square*

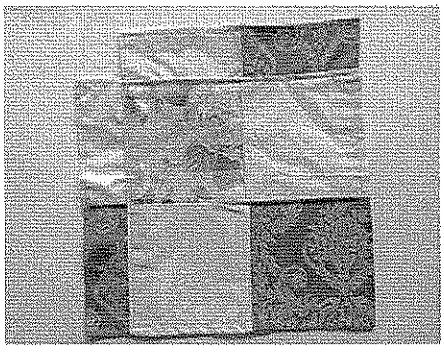


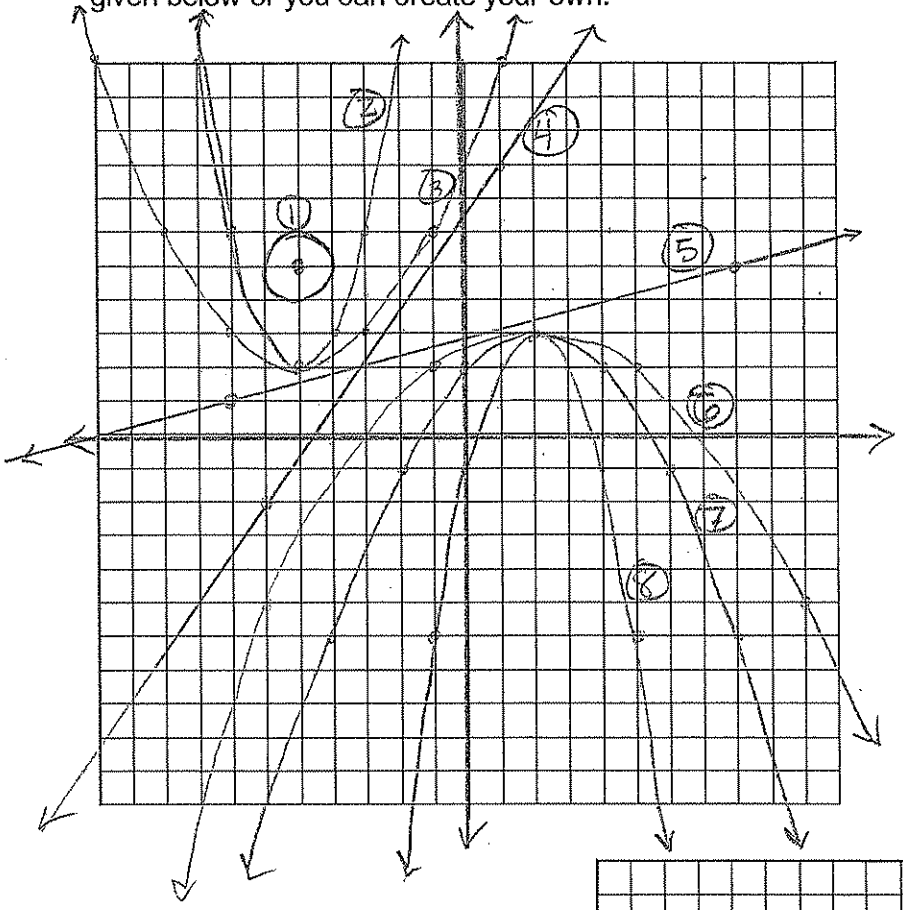
*Fig. 8: Final quilt square*

There are a lot of options for what to do with your final quilt square. It can be hung on the wall as hanging art, you can add fleece backing to it to make a hot pad for the kitchen or dining room, it can be stuffed and turned into a throw pillow, or you can sew several quilt squares together to make one LARGE quadratic quilt. The possibilities are endless.

*Enjoy*!

**System Painting Workshop**
**Instructions**

You will begin by creating or choosing lines to use for your system. You can use the example given below or you can create your own.

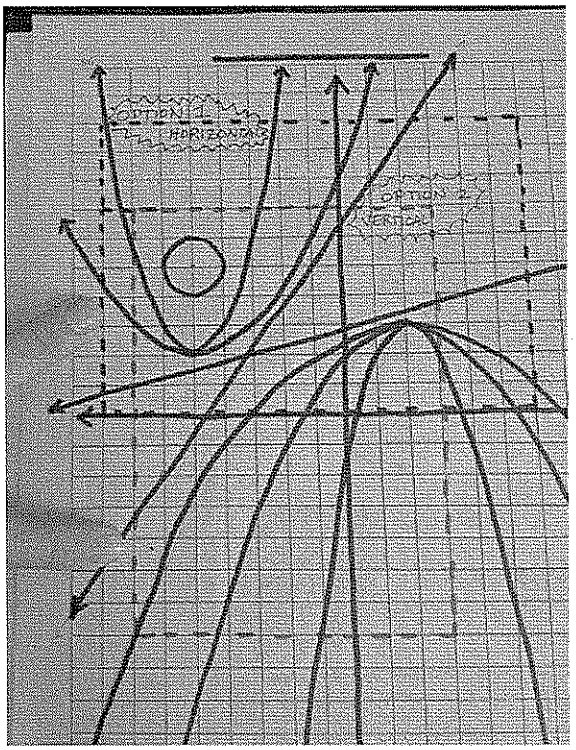



Your Equations

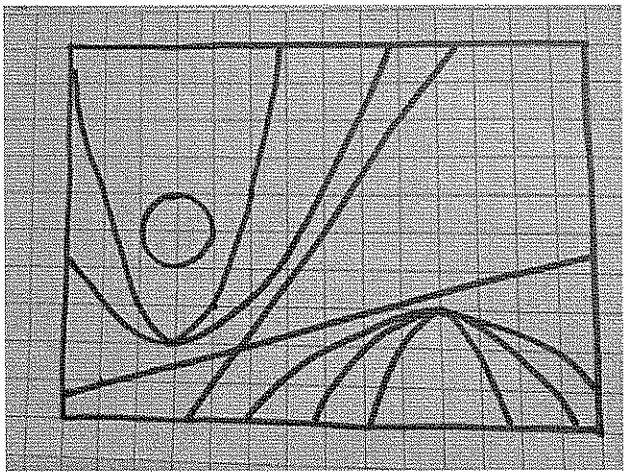
1. $(x+5)^2+(y-5)^2=1$
2. $y=(x+5)^2+2$
3. $y=\frac{1}{4}(x+5)^2+2$
4. $y-8=\left(\frac{10}{7}\right)(x-1)$
5. $y-5=\left(\frac{4}{15}\right)(x-8)$
6. $y=\frac{1}{9}(x-2)^2+3$
7. $y=\frac{1}{4}(x-2)^2+3$
8. $y=(x-2)^2+3$

Your Graph

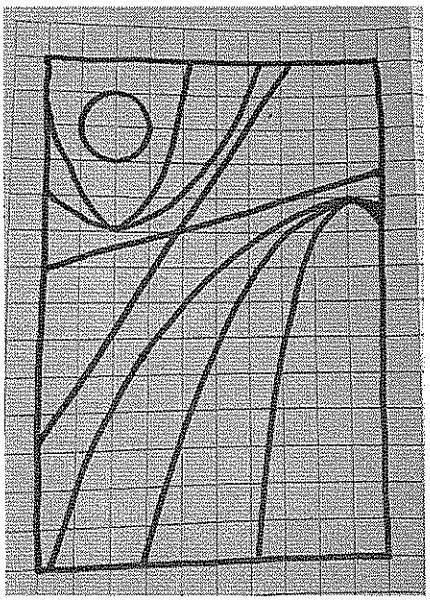
Once you have decided which system you will be using, you need to decide what portion of the system you would like to use. The canvases are approximately 5" x 7" and have a half inch grid. Choose a portion of your graph that is fourteen squares by ten squares. The selection can be horizontal or vertical.



*The Same system can produce many different paintings by using different regions*



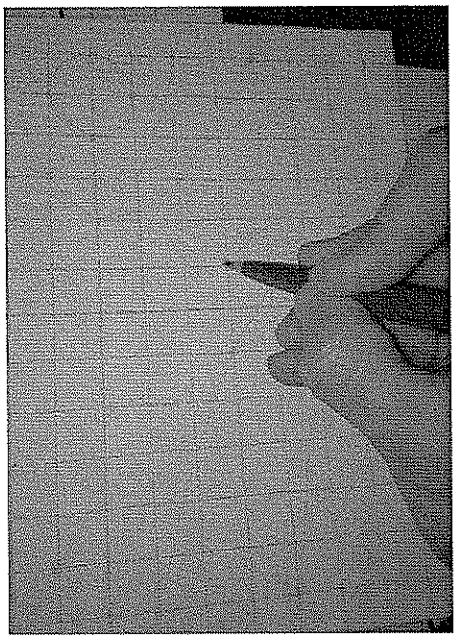
*A horizontal region*



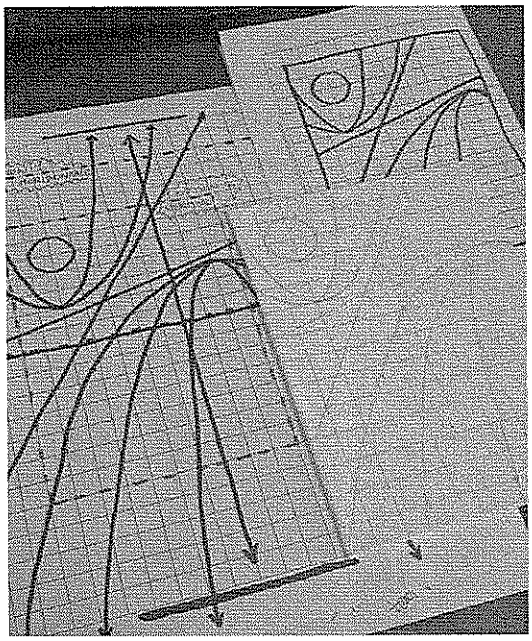
*A vertical region*

You can choose the section that you like the best. (Personally, I like the vertical one, here.)

Using your original graph and the grid on the canvas, transfer the functions onto the canvas. (It may help you to plot points first and then connect them to represent the functions.)

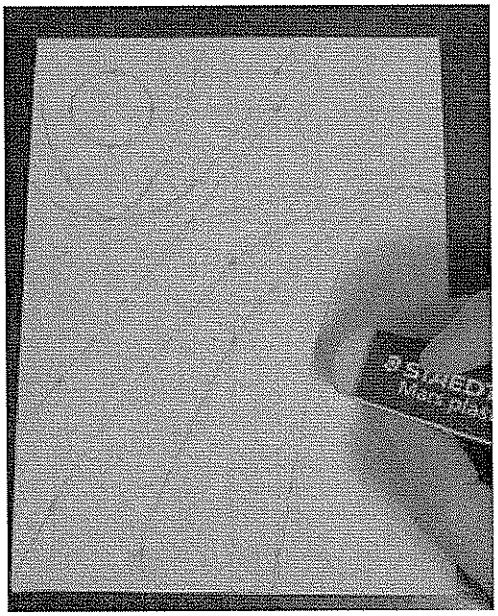


*Transferring the system*

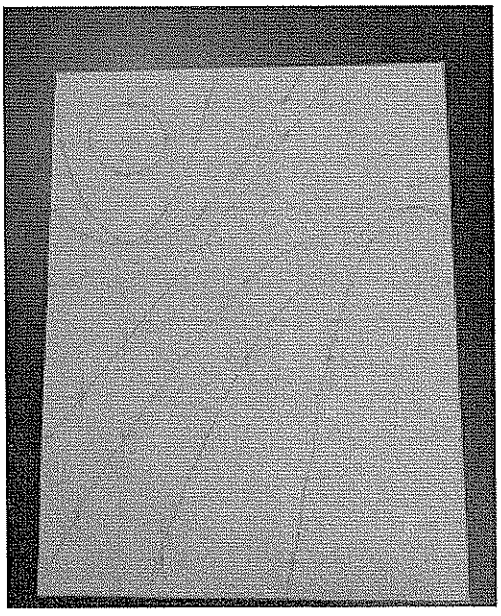


*The finished system on the canvas*

Once you have transferred the functions and double checked them for accuracy, you may erase the grid lines on the canvas. Afterwards you should be left with just the lines representing the functions.

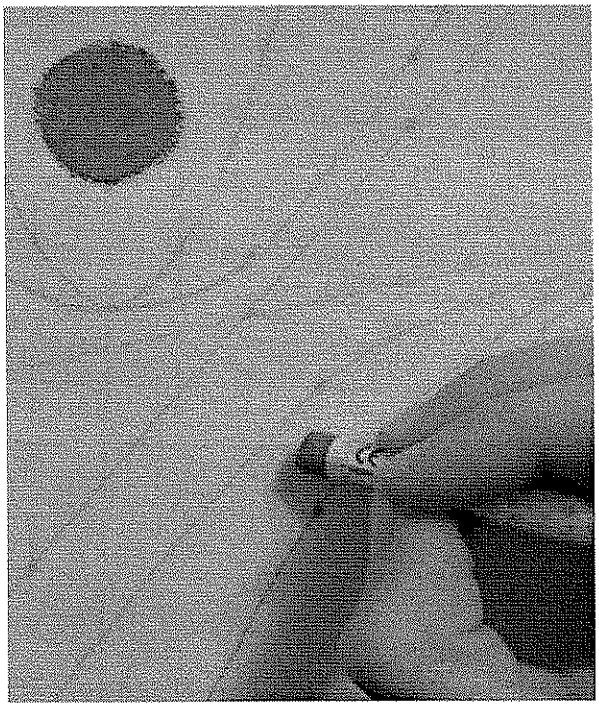


*Erasing the grid-lines*



*It's OK if you can't erase ALL of the grid-lines*

Now comes the fun part: coloring! Choose colors for each section of the canvas. You may use as many or as few colors as you would like. You may want to do light colors first and then dark colors to reduce the chance of them smearing together.



Make a plan before you begin coloring your canvas. In these pictures I am using craypas (oil pastels) and mini canvas boards. For our project today you are using sharpies and canvas boards. However, you may have different materials such as lots of extra markers, watercolors, or acrylic paints. This doesn't have to be fancy; use what you have, be creative and have fun.

The possibilities and outcomes for this project are endless. I encourage you to come up with your own versions that will fit with your units, enhance your students' creativity, and connect them to mathematical topics in ways that they never thought possible.