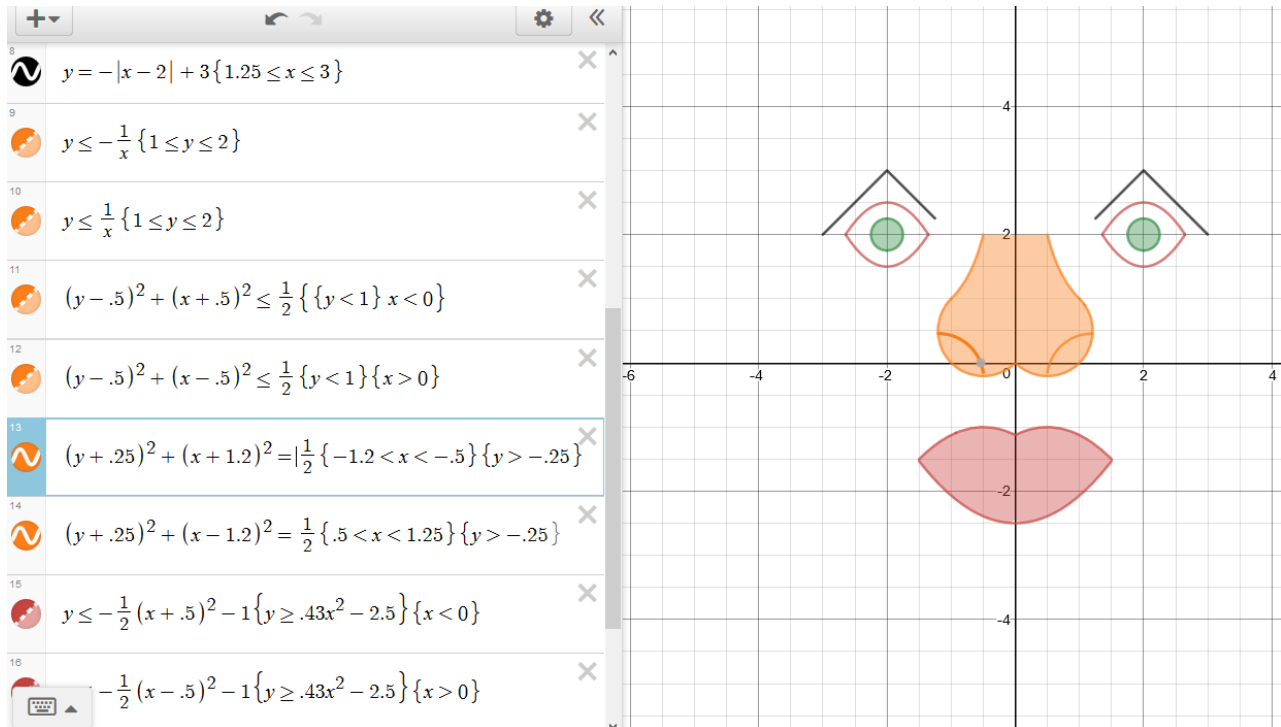


# Algebra 2: Functions Picture Project

## Reviewing Various Functions

In this project, you are going to create an image using the types of functions we have seen so far and your knowledge of transforming functions. I encourage you to help each other, but you are responsible for your own individual project!

Here is an example of an image that I created using quadratic, rational, and absolute value functions along with circles and inequalities.



**Step 1 DESIGN:** You're going to design an image that can be created with basic forms (rational, square root, exponential, linear, quadratic, absolute-value, sine, cosine and tangent functions and circles). You must present the design to me to ensure that it is appropriate and achievable. Your image must include **at least 15 segments**, be visually attractive, and include **the minimum requirements of the function types as outlined in the rubric**. **Each person's design needs to be sufficiently unique from the others. Be creative!**

**Step 2 DRAWING ON GRAPH PAPER:** Once the design looks unique and achievable and has been checked off, transfer it to a sheet of graph paper, centered roughly at the origin (0, 0), and make sure that your design can align with identifiable coordinates for ease of creating the necessary equations.

**Step 3 CREATING THE EQUATIONS AND DOMAIN/RANGE RESTRICTIONS:** Create the equations and inequalities in your picture, and include domain restrictions for them. This work should be done in advance of entering the data into DESMOS to expedite that effort. **This work will be turned in as part of your final grade**, so you should be neat as you go along.

**Step 4 DESMOS DRAWING:** Create an account on DESMOS.com and select START CALCULATOR. Enter the equations in the left panel. There is a video on portal and my webpage to provide the basic tools necessary for you to complete this portion. You may find that you have to tweak some of your equations as you start entering them. You may choose to embellish your original design when you see how cool some of this stuff can be. Just remember that every equation you

use MUST be recorded on your equations sheet to show each line/shading and how you created it. **SAVE** your drawing in your DESMOS account so that you can get back to it later.

**Step 5 PREPARE THE FINAL DRAWING FOR YOUR POSTER:** DESMOS has controls to allow you to make the lines thicker by selecting Projector Mode in the settings. It also allows you to turn off the grid lines. I will want two versions of your drawing, one with grid lines and one without. The one without grid lines will be used for your poster. **If you need me to print your drawing for your poster, you must submit the drawing 2 calendars early to allow plenty of time for me to print them.**

**Step 6 EQUATIONS SHEET:** Separately, type out your equations with domain restrictions, and accompany each equation with appropriate descriptions of transformations caused by the values within the equation. For example:

Equation with stated domain	Description of parameters / transformations
$y \leq -\frac{1}{x} \{1 \leq y \leq 2\}$	This builds the left side of the bridge of the nose. To shade in the nose, the range had to be limited.
$y \leq -\frac{1}{2}(x+.5)^2 - 1 \{y \geq .43x^2 - 2.5\}\{x < 0\}$	This creates the left side of the upper part of the lip and its shading. The range is limited to the equation of the parabola that creates the bottom of the lip. The domain also must be limited to so that it will stop at the center of the face. The vertex of the parabola is (.5, -1). It has a negative coefficient to turn it upside down. The coefficient is also less than 1 to flatten it out more like a pair of lips.

**Step 7 SUBMIT YOUR WORK:** The poster must be no larger than 10" x 14" so you will have to trim a small poster board to meet these limitations. Your drawing must be printed as large as possible on a regular sheet of paper and attached neatly to your poster. You should give your drawing a title and explain something about your drawing. The title can be hand written (NEATLY), but the explanation must be typed! You can embellish your poster as long as it does not overshadow your DESMOS drawing. Your drawing with grid lines must be submitted with the equations sheet. These are not to be attached to the poster.

Task	Due Date	Points for Submission
Step 1 DESIGN: Hand in a copy of your design	11 Nov	10
Step 2 DRAWING ON GRAPH PAPER: Hand in a copy of your drawing on graph paper	14 Nov	10
Step 3 CREATING THE EQUATIONS AND DOMAIN/RANGE RESTRICTIONS: Hand in a copy of your equations and restrictions to make sure you are on track.	17 Nov	10
Step 4 DESMOS DRAWING: Email preliminary drawing to ensure you are on track.	30 Nov	15
Step 5 PREPARE THE FINAL DRAWING FOR YOUR POSTER: Email final (almost final) drawings to ensure that you are on track.	7 Dec	15
Step 7 SUBMIT YOUR WORK: Hand in poster, equations sheet and drawing with grid lines	12 Dec	See rubric