

## Desmos Artwork Project

Grade 8 Mathematics

*Mr. Lass/Mr. Buck*

### Task:

You will create a piece of art using graphs of a variety functions and equations. As you develop your masterpiece, you will need to take the following into consideration:

- Which equations works best at providing you with best approximation of the lines or curves you need?
- How can you modify a *parent* equation to translate (move up/down, left/right) a particular line or curve?
- How can you modify a parent equation to rotate or reflect a particular line or curve?
- How can you modify a parent equation to dilate (stretch and/or shrink) a particular line or curve?
- How do I need to limit the domain or range of a particular function/equation so that a line or curve segment is the correct length?

### Requirements:

The goals of this project require you to:

- Create your *own* design. You may refer to the collection of student artwork on Desmos for ideas, but ultimately the creation must come from your own imagination and experimentation.
- Use a minimum of 30 equations
- Use at least 3 different types functions and/or equations. See list below.
- SIGN IN to Desmos, and save your art project in the following format:

Last name\_first initial\_desmosartwork2020

Share your finished project to [eric\\_lass@psbma.org](mailto:eric_lass@psbma.org) via google drive.

Complete the finished project by Friday, June 12th

### Assessment:

The following criteria will be used to assess your work:

- Accuracy
- Appropriate challenge
- Appearance
- Engagement/Effort

## Selected Parent Functions and Equations

Relation /Function Type	Parent	Standard/Transformed	Graph
<b>Linear</b>	$y = x$	$y = mx + b$ Or $y - k = m(x - h)$	
<b>Quadratic (parabola)</b>	$y = x^2$	$y - k = a(x - h)^2$	
<b>Rotated Quadratic</b>	$x = y^2$	$a(x - h) = (y - k)^2$	
<b>Cubic</b>	$y = x^3$	$y = a(x - h)^3 + k$	
<b>Exponential</b>	$y = a^x$	$y = a^{x-h} + k$	

<b>Logarithmic (Rotated exponential)</b>	$x = a^y$	$x - h = a^{y-k}$	
<b>Circle</b>	$x^2 + y^2 = r^2$	$(x - h)^2 + (y - k)^2 = r^2$	
<b>Ellipse</b>	$\frac{x^2}{a} + \frac{y^2}{b} = 1$	$\frac{(x - h)^2}{a} + \frac{(y - k)^2}{b} = 1$	
<b>Sine</b>	$y = \sin x$	$y = A \sin (Bx + C) + D$	

### Useful Desmos Features

1. Restricting the domain:
  - a.  $\{x > -3\}$  - includes only the part of the graph for values of  $x > -3$ .
  - b.  $\{1 \leq x \leq 6\}$  - includes only the part of the graph for values of  $x$  between (and including) 1 and 6
  - c. The range can be limited in a similar way, using  $y$  instead of  $x$ .
2. Shading
3. Folders
4. Colored lines
5. Dotted/dashed lines
6. Thick(er) line