Desmos Drawing Art Project

Task

- You task is to re-create a piece of artwork (painting, picture, cartoon, logo, etc.) using only graphs of functions, and plotted points. As you "draw," you will need to think strategically about which form of each equation will be easiest to fit to the curve or line you need, and how each equation transforms your graph from its parent function. Consider the characteristic shape of each kind of function, and which one might best approximate the curve you want. **You will likely need to include 100 or more functions to complete the piece.**

Steps (Pay attention to the deadlines below)

- **You need to have your artwork cleared by the teacher.** Once you have been given the okay, you can start re-creating the piece in Desmos.
- Complete the Desmos Art Activity (Code – 9QAHGN) prior to beginning your project for some practice. I also suggest you complete the Winking Boy Desmos Activity (Code – KF2RGX) as well.
- Afterwards, begin by sketching the major curves of your piece on graph paper. Write some equations based on key points of these outline curves. (They will not be exact, but will act as a guide for the rest of your project). Your equations may change when you put them into Desmos, but this is an important learning step.
- Once you've made your sketches, begin creating your graph in Desmos*****. **Save your graph in this format: "First Initial_Last Name_Desmos Drawing" example: A_McDonald_Desmos Drawing.** Graphs labeled without this format will not be accepted. (*You should log into Desmos using your school email.)
- Add detail until you are satisfied that your graph matches and conveys the original artwork.
- **Share your graph with the teacher by clicking the "Share Graph via email" button**
- **Complete a written reflection (3 paragraphs)**, which articulates your personal choices, and demonstrates understanding of the mathematical nuances of your graph. (See the Reflections Guide below). Share this reflection via email to Ms. McDonald.

Assessment

You will be assessed on the following criteria. See the rubric for details.

- Accuracy
- Appropriate Challenge
- Appearance
- Engagement
- Reflection

Deadlines (Starred deadlines count as homework assignments.)

Friday, October 12, 2018

- Share your artwork idea, and get the OK from the teacher to move forward

Wednesday, October 31, 2018

- Complete Desmos Art Activity (Code – 9QAHGN)
- Complete Winking Boy Desmos Activity (Code – KF2RGX)

Friday, November 30, 2018

- Share your in-progress graph for peer and teacher feedback
- Complete a draft reflection

Wednesday, January 2, 2019

- Print, mount, and hang your work
- Turn in finished reflection

Reflection Guide

Some suggested mathematical vocabulary for you to include as you reflect on this learning experience:

- Parent Functions (linear, quadratic, cubic, absolute value, square root, reciprocal, exponential, logarithmic, sine, cosine, tangent)
- Domain
- Range
- Equation
- Symmetry
- Vertex Form
- Standard Form
- Factored Form
- Factor
- Slope
- Slope Intercept Form
- Point Slope Form
- y-intercept
- x-intercept
- Axis/Axes
- Coordinate Plane
- Parent Function
- Cartesian Coordinates
- Intervals of increasing or decreasing
- Positive
- Negative
- Vertex
- Minimum
- Maximum
- Line of Symmetry
- Graph
- Function
- Coefficient
- Transformation
- Asymptote
- End behavior

Fill in **at least 10** of the blanks below to help you to reflect on your Desmos art project, and use these to help you to complete your reflection.

1. So far, _____ has been the hardest part of creating my Desmos art project.
2. I chose _____ as the subject for my project because _____.
3. Learning about _____ has changed the way that I see _____.
4. I found that my understanding of quadratic (or exponential, power, etc.) equations really improved during my work on this project.
5. At first, _____ didn't make sense to me, but now I feel like I really understand _____.
6. I found that the process of _____ was an important tool in my learning.
7. One of the big concepts that I take away from this project is _____.
8. I am fascinated by _____.

9. I was really surprised by _____.
10. I am especially proud of _____.
11. _____ demonstrates a strength of mine as a mathematical thinker.
12. _____ demonstrates a challenge of mine as a mathematical thinker.
13. I had trouble _____ but I was able to _____.
14. One detail that I'm proud of is _____.
15. Although I was having trouble understanding _____, I kept trying until I was happy with _____.
16. I used different forms of _____ to help me to make my graphs.
17. Using _____ form of a quadratic (or exponential, power, etc.) equation helped me to figure out _____.
18. _____ helped me to translate and quantify my ideas.
19. I found that Desmos was a good tool for me to express _____ because _____.
20. I was able to be really precise in my math model. One example of this was _____.
21. (Free Space) _____.

Project Rubric[++]

	A (100 points)	B (50 points)	C (25 points)
Accuracy (30%) *How closely does your graph match your intention?*	• Equations **match the original artwork perfectly or nearly so** • Graph conveys both the image and the nuances of design from the original work • **All details** from the original work are included	• Equations **mostly match the original artwork, but may have slight differences** • **Most details** from the original work are included	• **Recognizable** (you can tell that it came from the original artwork) • **Some details** from the original work are included
Appropriate Challenge (20%) *Students are expected to produce work that is commensurate with the level of the course.*	• Graph **makes clear and logical use of** ALL Parent Function Equations or Inequalities discussed • Demonstrated effort and detail • Subject choice was **highly challenging**	• Graph **makes good use of** MOST parent function equations or inequalities discussed • Subject choice was **challenging**	• Graph **makes adequate use of** SOME parent function equations discussed • Subject choice was **challenging** enough for the level of the course
Appearance (20%) *Students are expected to polish and produce finished work so viewers can engage with the math concepts*	• **Exceptional and clean** presentation **with attention to detail** (Including mounting and hanging on the Math wall)	• Good presentation. **Clean with some attention to detail** (Including mounting and hanging on the Math wall)	• **Completed presentation, but little attention to detail** (Including mounting and hanging on the Math wall)
Engagement (20%) *This criterion assesses the extent to which the student engages with the exploration and makes it his or her own. Personal engagement may be recognized in different attributes and skills. These include thinking independently and/or creatively, addressing personal interest, and presenting mathematical ideas in their own way.*	• Student demonstrates that he or she has chosen a project that they care about • There is **abundant evidence of outstanding personal engagement** • **Thoroughly creative use of equations**	• There is **evidence of significant personal engagement** • Demonstrates **some creativity**	• There is **evidence of some personal engagement.** • Demonstrates **little creativity**
Reflection (10%) *This criterion assesses how the student reviews, analyses and evaluates the exploration. Although reflection may be seen in the conclusion to the exploration, it may also be found throughout the exploration.*	• There is **substantial evidence of thorough and detailed critical reflection.** • Written reflection is polished, printed, thoughtful, and **includes appropriate mathematical vocabulary** • The reflection is **coherent, well organized, concise and complete**	• There is **evidence of meaningful reflection** • Written reflection is printed and includes some mathematical vocabulary • The reflection is **coherent and well organized**	• There is **evidence of limited or superficial reflection** • Written reflection is printed but **includes little mathematical vocabulary** • The reflection has **some coherence and shows some organization.**

++ It is possible to receive 0 points is a criterion if your project DO NOT meet the minimum requirement.