Name_____   Pre-Calc AB

Graphing Art Project   Due Date: WED, MAY 13

Goal: Using graph paper, draw a picture containing graphs of conic sections (i.e., ellipse, parabolas, hyperbolas), and other functions we have studied this year in Pre-calculus.   You must incorporate 10 different equations of these types. (No extra credit for more than 10). You may work with one partner, or you make work independently.

You must include exactly one absolute value graph, at least two parabolas (at least one of these should have a horizontal axis), one circle, one ellipse, and one hyperbola.   The other four are graphs of your choice (but no more than one line). These "artist choice" graphs may be other conics, sinusoids or other trig graphs, polar graphs, exponential, logarithmic or logistic.

Submit for evaluation:

1. The Art: 5 points   Your picture with the required 10 elements outlined in black. Color it appealingly, and add other elements (like freckles, leaves, background shading, etc) of your choice. Give it a title.

1. The Math: 10 points

    a. A graph of *just* the required 10 elements, with coordinate axes. This "skeleton" of the final picture must have the 10 graphs in the exact same location they appear on the picture. **Number all the elements to coincide with the numbered list on the score sheet.**
    b. Using the same numbering system, list the equations for each of the ten elements, and *give the domain and range (see important note below).*

3. The Evaluation: 1 point   Write a few sentences about your thoughts on the project. Rate by interest, educational value, difficulty.
1. The Scoresheet: Include it with your final project

Very important: Say, for example, your picture includes parts of a parabola and an ellipse to create a hat. You must tell the restrictions on the variables that limit your graphs. (See example below).
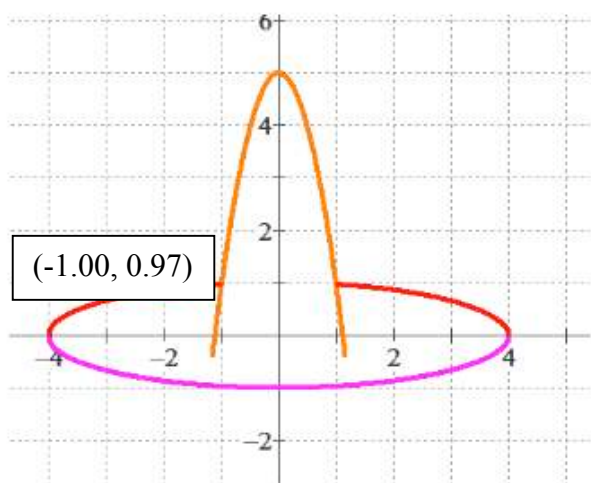
The equation of the parabola is: $y = 5-4x^2$
The domain of a parabola is usually $(-\infty,\infty)$, but here it is restricted to: -1.20 $\leq x \leq$ 1.20. To find the corresponding range, you need to plug in x =1.2 to see what the lowest point on the graph is. It turns out the range is -0.76 $\leq y \leq$ 5.

The equation for the ellipse is $\dfrac{x^2}{16} + y^2 = 1$

The domain of the ellipse is unchanged: $-4 \leq x \leq 4$ For the range, however, the ellipse doesn't actually reach it's highest point because the parabola cuts it off. To find the range, you need figure out the intersection of the parabola and ellipse. It turns out that the range is: $-1 \leq y \leq 0.97$

Name(s)_____   Title _____
Graphing Art Project   *Scoring Checklist - Attach this to project*

The math: 10 equations; with their graphs on the same axes, domains and ranges given, accurately drawn. 10 total points

Domains and ranges must be the ones actually used in the picture.

	Equation Accurate?	Domain Accurate?	Range Accurate?
1. Absolute value (only one)	_____	_____	_____
2. Parabola #1 – horizontal axis	_____	_____	_____
3. Parabola #2	_____	_____	_____
4. Circle	_____	_____	_____
5. Ellipse	_____	_____	_____
6. Hyperbola	_____	_____	_____
7. Artist choice #1:	_____	_____	_____
8. Artist choice #2:	_____	_____	_____
9. Artist choice #3:	_____	_____	_____
10. Artist choice #4:	_____	_____	_____

The art: 5 points total

1. Title   (1)   _____

2. 10 equations are accurately incorporated into the picture,

outlined in black , and neat 0-2   _____

3. Design appeal, creativity, neatness cleverness,

difficulty etc. 0-2   _____

Evaluation (1 point)   **(**Interest, educational value, difficulty)   _____

Late Penalty – 1 point off per school day (not class day) _____

Total Score _____