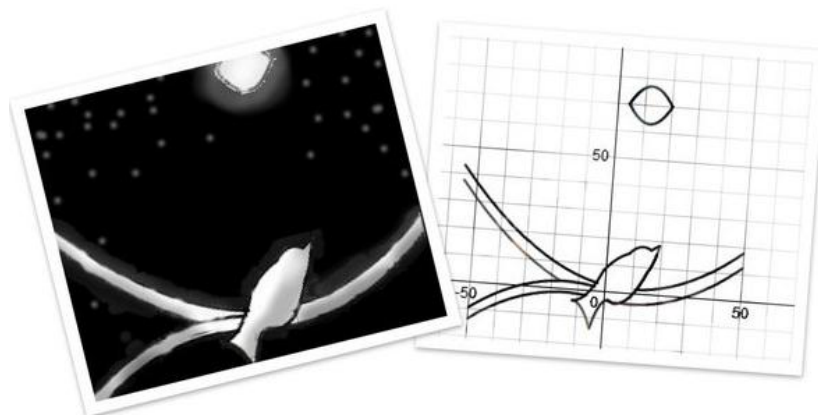# PARABOLIC ART!

Ahlena & Caroline's artwork

- Your task is to create your own "artwork" using **only** parabolas.
- Use your knowledge of transformations to create all of the equations you need.
- This task is due by the end of class on _____
- Start by sketching, on graph paper, what your design will look like with approximate equations. Once this task is accomplished, show it to your teacher and you can then begin with the graphing technology.

You will need to use piecewise functions to create your artwork. These are graphs that are only defined for certain values of *x*. These values are called the domain.

Go to https://www.desmos.com/ and launch the calculator. You will need to create an account in order to be able to save your work and to share it.
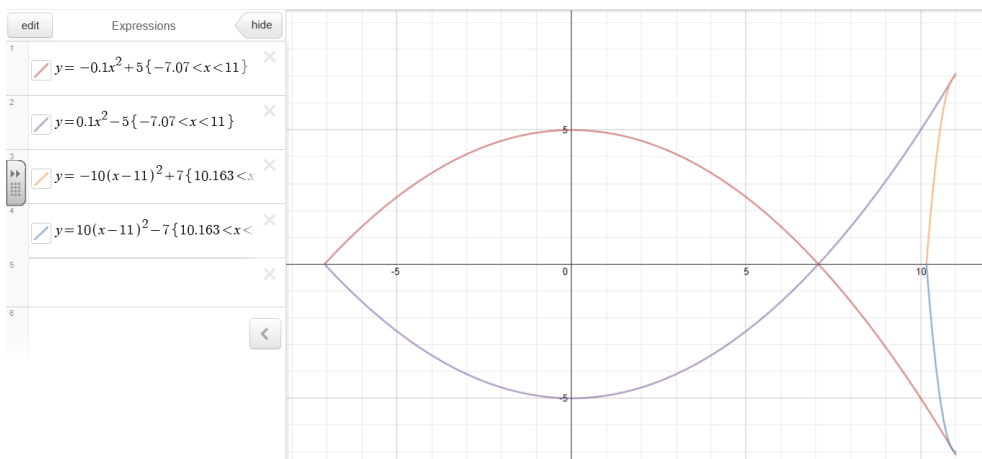
We will draw a simple fish.

1. Graph $y = -0.1x^2 + 5$
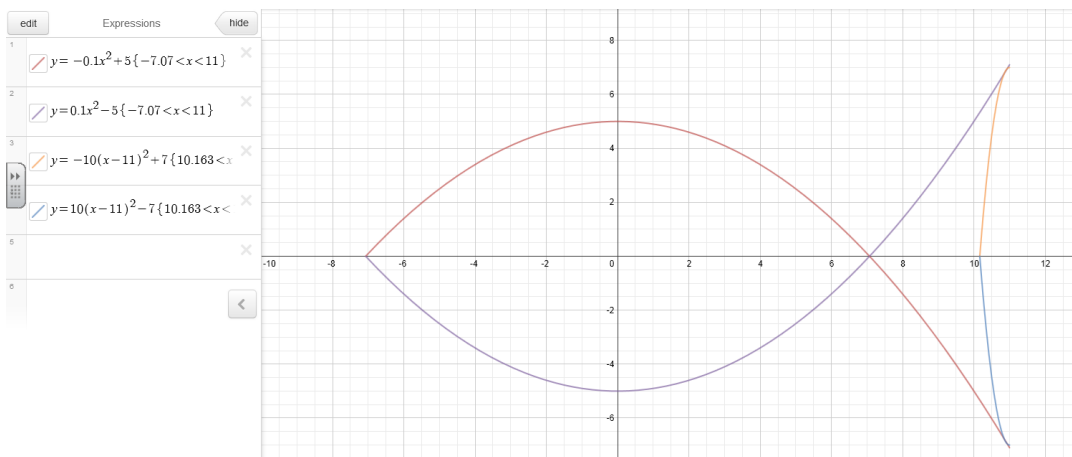
2. Graph $y = 0.1x^2 - 5$
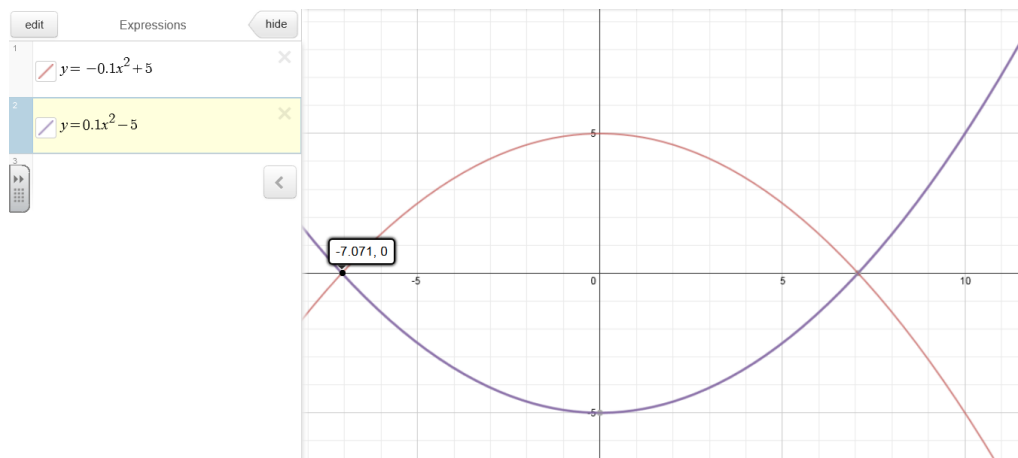
3. Place your cursor on the left intersection point and click so that the coordinates appear.
4. We want to cut the graphs off at approximately *x* = -7.07. We need to add the domain to the end of the equation, in brace (curly) brackets: $y = -0.1x^2 + 5 \{x > -7.07\}$. Repeat for the second equation.
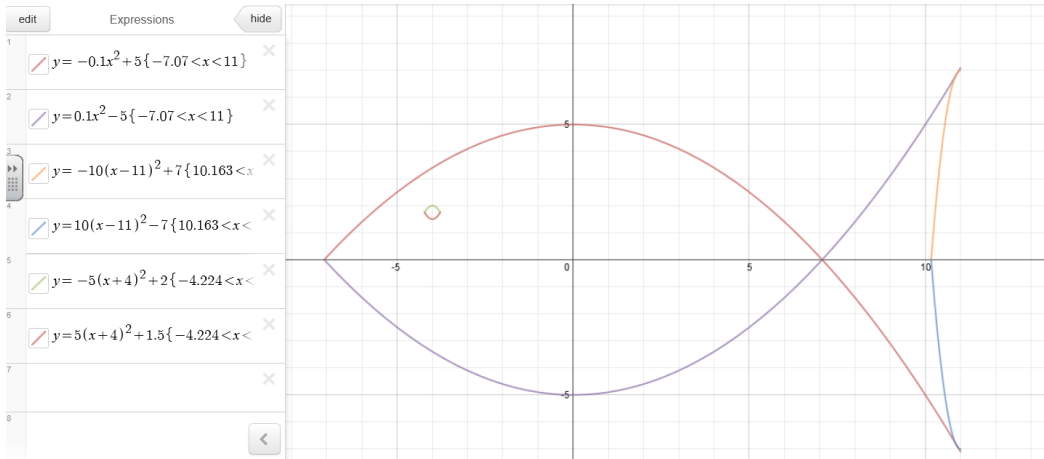
The first graph shows expressions:
- $y = -0.1x^2 + 5\{x > -7.07\}$
- $y = 0.1x^2 - 5\{x > -7.07\}$
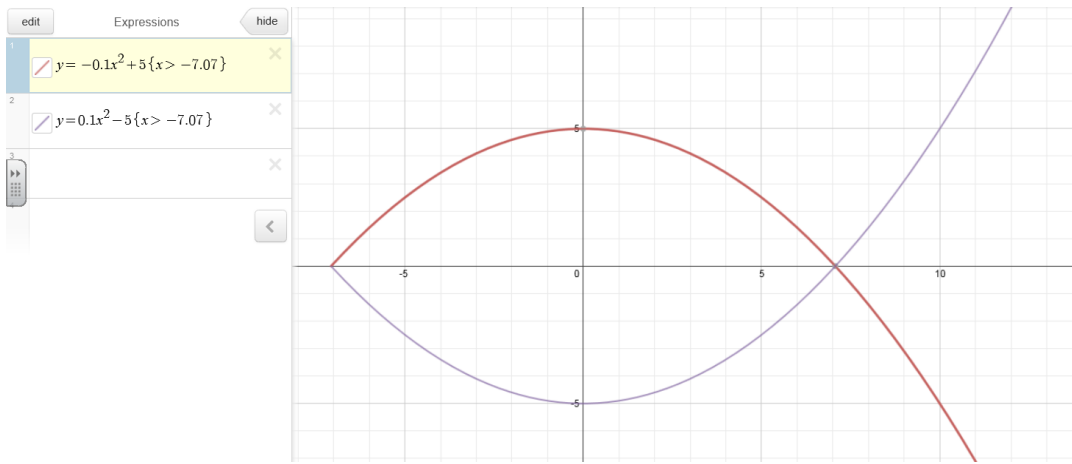
5. Let's change the window so that we can see the tail better. Click on the wrench icon, and change the maximum x-value to 15.

6. I want to cut off the graphs at $x = 11$ to make a tail. We need to change the domain for both equations to $\{-7.07 < x < 11\}$.

Expressions:
- $y = -0.1x^2 + 5\{-7.07 < x < 11\}$
- $y = 0.1x^2 - 5\{-7.07 < x < 11\}$
- $y = -10(x-11)^2 + 7\{10.163 < x$
- $y = 10(x-11)^2 - 7\{10.163 < x <$

7. Add equations for the tail and determine where to cut them off. Notice that if you click "edit" there is a duplicate icon.

Expressions:
- $y = -0.1x^2 + 5\{-7.07 < x < 11\}$
- $y = 0.1x^2 - 5\{-7.07 < x < 11\}$
- $y = -10(x-11)^2 + 7\{10.163 < x$
- $y = 10(x-11)^2 - 7\{10.163 < x <$

8. I added an equations for an eye.

The expressions panel shows:

1. $y = -0.1x^2 + 5\{-7.07 < x < 11\}$
2. $y = 0.1x^2 - 5\{-7.07 < x < 11\}$
3. $y = -10(x-11)^2 + 7\{10.163 < x$
4. $y = 10(x-11)^2 - 7\{10.163 < x <$
5. $y = -5(x+4)^2 + 2\{-4.224 < x <$
6. $y = 5(x+4)^2 + 1.5\{-4.224 < x <$

9. You may wish to remove the axes and grid for the final product. You can also change colours by clicking on "edit".
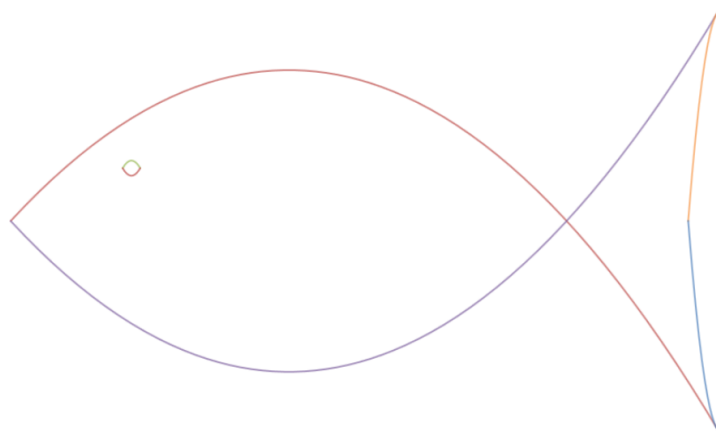
You will be marked on (not equally weighted):

Complexity: number of equations: _____	R	1	2	3	4
Technical Appearance	R	1	2	3	4
Overall Appearance	R	1	2	3	4
Rough Work	R	1	2	3	4