Read each question carefully and be sure to SHOW ALL WORK. Correct answer without proper justification will not receive a "Complete" grade. Paç fat! Good luck!

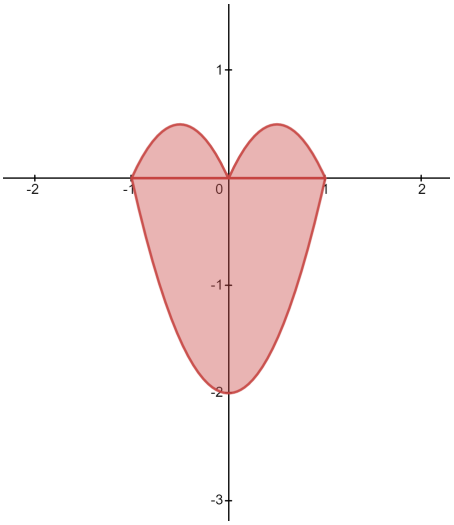
Name: _____

LO 6. Area [CORE]. I can use the "divide and conquer strategy" to find areas.

Criteria for Success: I can

- use the divide and conquer method to slice a region vertically or horizontally, find the area of a general slice, and setup the corresponding Riemann sum and definite integral
- solve questions related to computing areas or average values of functions

Question: A student came up with the following graph of a heart for Valentine's day: `https://www.desmos.com/calculator/l7sj2ribee`, given by the equations $y = -2x(x+1)$ on the interval $[-1, 0]$ and $y = -2x(x-1)$ on the interval $[0, 1]$ for the top part of the heart and $y = 2(x^2-1)$ on the interval $[-1, 1]$ for the bottom part of the heart. Find the exact area of the heart using two different methods. Check to make sure the answers match and are reasonable.



LO 9. Volume and Mass/Weight [CORE]. I can use the divide and conquer strategy to find the volume, mass or weight of an object.

Criteria for Success: I can

- use the divide and conquer method to slice a shape, find the volume or mass/weight of a general slice using similar figures, or the Pythagorean Theorem, and setup the corresponding Riemann sum and definite integral
- use the divide and conquer method to slice a shape of revolution, find the volume of a general slice by discs/washers or tubes/shells, and setup the corresponding Riemann sum and definite integral

Question: What is the volume of the shape created by rotating the heart in the previous question about the y-axis. Show the application of Divide and Conquer method by filling out the following blanks. **Setup but do not solve the definite integral.**

Volume of slice: Riemann Sum:

Sketch of slice: Definite Integral: