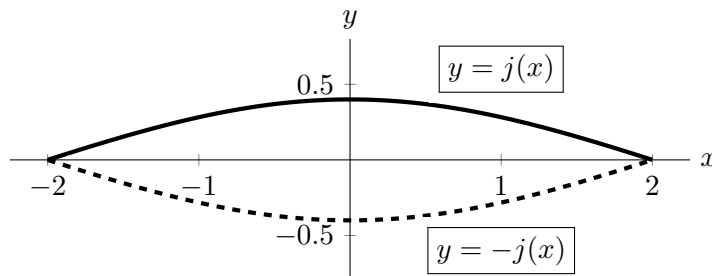


6. [8 points] A rattleback top is a toy that exhibits interesting physical properties. The toy can be modeled by a solid whose base is the region between the graphs of $j(x)$ and $-j(x)$, shown below. The cross sections perpendicular to the x -axis are semicircles.



The graph of $j(x)$ is solid, the graph of $-j(x)$ is dashed, and the units on both axes are centimeters. Both graphs are bounded between the vertical lines $x = -2$ and $x = 2$.

- a. [5 points] Set up, but do **not** evaluate, an expression involving one or more integrals that gives the volume, in cubic centimeters, of the solid rattleback top. Your answer may involve the function name j .
- b. [3 points] In order to make the rattleback top spin like a top, it is made out of plastic that has a mass density given by the function $\delta(x)$ grams per cubic centimeter, where x is the x -coordinate in the diagram above. Set up, but do **not** evaluate, an expression involving one or more integrals that gives the mass, in grams, of the rattleback top. Your answer may involve the function names j and/or δ .