GROUP WORK 2, SECTION 11.2

You Gotta Have Heart

Consider the parametric curve $x = (\cos t)\,(1 + \cos t)$, $y = (\sin t)\,(1 + \cos t)$, $0 \le t \le 2\pi$.

1. Draw a graph of this curve.

2. Set up an integral to find the surface area formed by rotating the portion of the curve in the first quadrant about the x-axis.

3. Show that your first integral can be simplified to $\int_0^{\pi/2} 2\sqrt{2}\pi\,(1 + \cos t)^{3/2} \sin t\,dt$. Compute this integral to find the surface area.

4. Explain the title of this exercise.