Questions

1. Find the arc length of each of the following curves from $x = 0$ to $x = s$:

   (a) $f(x) = \cos(x)$

   (b) $f(x) = \ln(x + 1)$

   (c) $f(x) = \sqrt{4 - x^2}$

   Find the volume of the solid of revolution around the $x axis$:

   (a) $f(x) = x^3$ from $x = 0$ to $x = 1$

   (b) $f(x) = \sin$ from $x = 0$ to $x = \pi$.

2. Find the volume of the solid of revolution around the y axis for $f(x) = x^3$.

3. Find the volume of the solid of revolution between $f(x) = x$ and $g(x) = x^3$ around the x axis from $x = 0$ to $x = 1$.

4. Graph (approximately) each of the following polar curves:

   1. $r(\theta) = \frac{1}{2}\theta$

   2. $r(\theta) = \ln(e + \theta/2\pi)$

   3. $r(\theta) = \cos(\theta)$

   4. $r(\theta) = 1 + \sin(\theta)$

   Compute each of the following:

   1. The arc length of the spiral $(\theta) = \theta$ from $\theta = 0$ to $\theta = 2\pi$.

   2. The area of the first petal of $r(\theta) = 3\sin(2\theta)$.

   3. The spiraling area between $r(\theta) = \theta + 1$ from $\theta = 0$ to $\theta = 2\pi$.