Solids of Revolution

1. The following region is given by the graph of $\sin(x)$ on the interval $[0, \pi]$.

If you rotate this region about the $x$-axis, what shape do you get? What is its volume? How about if we rotate the region around the line $y = -1$?

2. Find the volume of the solid obtained by rotating about the $x$-axis the region under the curve $y = \sqrt{x}$ on the interval $[0, 1]$.
3. Find the volume of the solid obtained by rotating about the $x$-axis the region enclosed by the curves $y = \sqrt{x}$, $y = \frac{1}{10}x$ and $x = 4$.

4. Find the volume of the solid obtained by rotating about the line $x = -1$ the region enclosed by the curves $y = \sqrt{x}$ and $y = \frac{1}{2}x$. 