1. Find the volume obtained by revolving around the $x$-axis the small region bounded above by $y = x(1-x)$ and below by the $x$-axis.

2. The curves $y = x^{1/4}$ and $y = x^4$ intersect at $(0, 0)$ and $(1, 1)$. Find the volume obtained by revolving the small region between these two curves around the $x$-axis.