1. Find the area of the region bounded by the curves $y = \sin x$ and $y = \cos x$, $x = 0$ and $x = \frac{\pi}{2}$.

2. The region enclosed by the curves $x = y$ and $x = y^2$ is rotated about the line $x = -1$. Find the volume of the resulting solid. (Use the washer method 7.2)
3. Use cylindrical shells to find the volume of the solid obtained by rotating the region bounded by $y = 2x^2 - x^3$ and $y = 0$.

4. Find the exact arc length of the curve $x = \frac{1}{8} y^4 + \frac{1}{4} y^{-2}$ from $y = 1$ to $y = 4$. 