Math 232 Worksheet 2 - Shell Method

1. Find the volume of the solid obtained by rotating about the y-axis the region bounded by $y = -x^2 + 4x - 3$ and $y = 0$.

2. Find the volume of the solid obtained by rotating about the line $y = 2$ the region bounded by $y = \sqrt{x}$ and $y = x$. Use (1) the washer method; (2) the shell method.

3. Use the shell method to show that the volume of the unit sphere is $\frac{4\pi}{3}$.

Answer keys

1. $\frac{16\pi}{3}$

2. $\frac{\pi}{2}$

3. Hint: use u-substitution to evaluate an integral of the form

$$\int x\sqrt{1-x^2}dx.$$