

Math 132: Calculus for Physical and Life Sciences 2
Answers for Problem Set 6
Due Friday, March 14, 2008, at the beginning of class.

1. (a) Cross sections are disks with radius $x^2 + 2$. Volume of solid is $\frac{293\pi}{15}$.
(c) The cross-section by a plane $x = c$ is a washer with inner radius $2 - \sin(x)$ and outer radius 2. The volume is $8\pi - \frac{\pi^2}{2}$.
(e) The solid generated rotating around the x -axis is the union of two solids meeting only along the plane $x = \sqrt{2}/2$. The cross-sections of the first are the washers with inner radius x and outer radius $2x$. The cross-sections of the second are also washers with inner radius x and outer radius $1/x$. The total volume is $\frac{4\pi}{3}(\sqrt{2} - 1)$.
(g) The cross-section by a plane $y = d$ is a washer with inner radius $\frac{1}{y}$ and outer radius 2. The volume equals $\frac{49\pi}{4}$.
2. *Answer:* $36\sqrt{3}$.
3. *Answer:* 40000π cubic feet.
4. (a) The graph is a straight line from the point $(3, -2)$ to the point $(11, 4)$. The arclength is 10.
(c) The curve is the arc of a circle with radius 3 and center $(0, 0)$ starting at $(0, 3)$ and proceeding clockwise to $(0, -3)$ (one half of the full circle). The arclength is 3π .
5. Arclength $\doteq 3.343018$.
6. (a) *Answer:* $\frac{-2}{9\pi}$.
8. *Answer:* 3.44 units.