

Section 7.1

1. Find the area bounded by  $y = \cos x$ ,  $y = 0$ ,  
 $x = 0$ ,  $x = \frac{\pi}{3}$ .

2. Find the area bounded by  $y = \sin x$ ,  $y = 0$ ,  
 $x = \frac{\pi}{4}$ ,  $x = \frac{3\pi}{2}$ .

3. Find the area bounded by  $y = x^2$  and  $y = 2x - x^2$ .

4. Find the area bounded by  $y = x - 1$  and  $y^2 = 2x + 6$ .

5. Find the area bounded by  $y = \sin x$ ,  $y = \cos x$ ,  
 $x = -\frac{\pi}{2}$  and  $x = \frac{\pi}{2}$ .

6. Find the area bounded by  $y = |2 - x^2|$ ,  $y = 0$ ,  
 $x = 0$ ,  $x = 2$ .

Section 7.2

7. Find the volume of the solid obtained by revolving the region bounded by  $y = e^x$ ,  $y = 0$ ,  $x = 0$ ,  $x = 1$  about the  $x$ -axis.

8. Find the volume of the solid obtained by revolving the region bounded by  $y = 3x^2$ ,  $0 \leq x \leq 2$ ,  $y = 12$  and  $x = 0$  about the  $y$ -axis.

9. Find the volume of the solid obtained by revolving the region bounded by  $y = x^2$ ,  $y = 4x$ , about the  $x$ -axis, then the  $y$  axis.

10. Find the volume of the solid obtained by revolving the region bounded by  $y = x^2$ ,  $y = 4$ , about the line  $y = 4$ .

11. Find the volume of the solid obtained by revolving the region bounded by  $x = y^2$ ,  $x = 1$ , about the line  $x = 1$ .

12. Find the volume of the solid obtained by revolving the region bounded by  $y = x$ ,  $y = \sqrt{x}$ , about the line  $x = 2$ .

13. Find the volume of the solid  $S$  described here:  
The base of  $S$  is the region bounded by  $y = x^2$   
and  $y = 4$ . Cross-sections perpendicular to the  
 $y$  axis are squares.

14. Find the volume of the solid  $S$  described here:  
The base of  $S$  is the triangular region with vertices  $(0, 0)$ ,  $(3, 0)$  and  $(0, 2)$ . Cross-sections perpendicular to the  $x$  axis are semi-circles.

Section 7.3

15. Find the volume of the solid obtained by rotating the region bounded by the given curve(s) about the specified axis.

a.)  $y = \frac{1}{x^2}$ ,  $x = 2$ ,  $x = 4$ ,  $y = 0$  about the  $y$  axis.

b.)  $y = x^2$ ,  $y = 16$ ,  $x = 0$  about the  $x$ -axis.

c.)  $y = x^2$ ,  $y = 3x$ . Rotate around the  $x$ -axis.  
Now rotate around the  $y$  axis.

d.)  $y = x^3$ ,  $y = 0$ ,  $x = 1$ ,  $x = 2$ . Rotate around the line  $x = -1$ .

e.)  $y = \sqrt{x}$ ,  $x = 0$ ,  $x = 4$ ,  $y = 0$ . Rotate  
around the line  $y = 3$ .

f.)  $y = \ln x$ ,  $y = 0$ ,  $x = 4$  about the  $y$  axis. Do not evaluate the integral.