Spring 2009 Math 152

Week in Review I

courtesy: Amy Austin

(covering sections 7.1, 7.2, 7.3)

Section 7.1

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

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

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 $y = \sin x$, $y = \cos x$, $x = -\dfrac{\pi}{2}$ and $x = \dfrac{\pi}{2}$.

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 $y = 3x^2$, $0 \le x \le 2$, $y = 12$ 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.) $y = \dfrac{1}{x^2}$, $x = 2$, $x = 4$, $y = 0$ 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.