BC Chapter 8 Study Guide

1. What is the area of the shaded region shown?


$y = 2x^2 + 8$

$y = x^4$

NOT TO SCALE
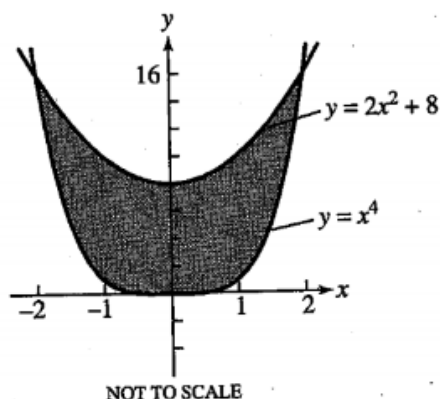
2. What is the area enclosed by $y = \sin x$ and the x-axis for $-2\pi \le x \le 2\pi$?

3. Find the area enclosed by $y = 3\sqrt{x}$, $y = 20 - 2x$, and the x-axis.

   (A) 39.5736   (B) 45.3125   (C) 46.7382
   (D) 49.7318   (E) 54.1402

4. The function $v(t) = 9 - t^2$ is the velocity of a particle moving along the x-axis, where t is measured in seconds ($t \ge 0$) and the velocity is measured in m/sec.

   (a) Determine when the particle is moving to the right, to the left, and stopped.
   (b) Find the particle's displacement for $0 \le t \le 6$.
   (c) Find the total distance traveled by the particle for $0 \le t \le 6$.

5. The graph shows the velocity of a particle moving on the x-axis. The particle starts at $x = -5$ when $t = 0$.

   (a) Find where the particle is at the end of the trip ($t = 6$).
   (b) Find the total distance traveled by the particle.
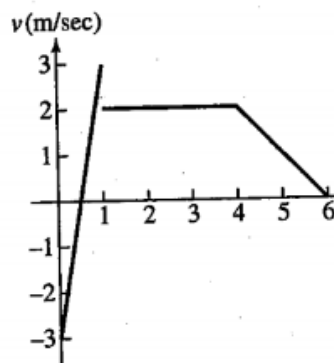
6. The rate of expenditures on public elementary and secondary schools, in billions of dollars per year, in a region of the United States can be modeled by the function $S = 6.81e^{0.082t}$, where t is the number of years after January 1, 1980. What are the total expenditures from January 1, 1980 to January 1, 2005 for this model?

7. What is the volume generated by revolving the shaded region around the x-axis? Use disks.
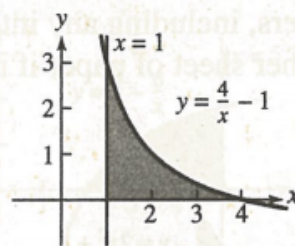
8. A region bounded by $y = \sqrt{36 - x^2}$, $y = 6$, and $x = 6$ is revolved around the y-axis. Use cylindrical shells to find the volume of the solid generated.

9. Find the area of the surface generated by revolving the curve $y = \dfrac{x^3}{9}$, $0 < x < 2$, about the x-axis.

10. A curve is given by $y = (16 - x^{2/3})^{3/2}$ for $1 \le x \le 27$. Find the exact length of the curve analytically by antidifferentiation.