For each problem make sure that you draw an accurate representation of the region being rotated and that you label the appropriate lengths ($R(x \setminus y)$, $r(x \setminus y)$, $\rho(x \setminus y)$, and/or $h(x \setminus y)$). Use your calculator to evaluate the integral.

1. Use the Disc Method to find the volume of the solid that results from rotating about the line $y = 3$ the region enclosed by the lines $2x - 3y = 1$, $x = 2$, and $y = 3$.

2. Use the Shell Method to find the volume of the solid that results from rotating about the line $y = 3$ the region enclosed by the lines $2x - 3y = 1$, $x = 2$, and $y = 3$.

3. Use the Washer Method to find the volume of the solid that results from rotating about the line $x = 7$ the region enclosed by the lines $2x - 3y = 1$, $x = 2$, and $y = 3$.

4. Use the Shell Method to find the volume of the solid that results from rotating about the line $x = 7$ the region enclosed by the lines $2x - 3y = 1$, $x = 2$, and $y = 3$.

5. Find the volume of the solid that results from rotating about the line $x = 2$ the region enclosed by the curves $y = 3 - 2x$ and $y = x^2 - x - 3$.

6. Find the volume of the solid that results from rotating about the line $y = 9$ the region enclosed by the curves $y = 3 - 2x$ and $y = x^2 - x - 3$.

7. Find the volume of the solid that results from rotating about the line $x = -4$ the region enclosed by the lines $8x + 5y = 14$, $8x - y = 26$, and $y = 6$. Choose the method that enables you to find the volume using only one integral (as opposed to changing the definition of a formula somewhere over the interval of integration).

8. Find the volume of the solid that results from rotating about the line $y = -4$ the region enclosed by the lines $8x + 5y = 14$, $8x - y = 26$, and $y = 6$. Choose the method that enables you to find the volume using only one integral (as opposed to changing the definition of a formula somewhere over the interval of integration).

9. Find the volume of the solid that results from rotating about the line $y = -4$ the region enclosed by the lines $x - y = -2$, $9x - 5y = 6$, and $x = -1$. Choose the method that enables you to find the volume using only one integral (as opposed to changing the definition of a formula somewhere over the interval of integration).

10. Find the volume of the solid that results from rotating about the line $x = -4$ the region enclosed by the lines $x - y = -2$, $9x - 5y = 6$, and $x = -1$. Choose the method that enables you to find the volume using only one integral (as opposed to changing the definition of a formula somewhere over the interval of integration).
11. Use the Shell Method to find the volume of the solid that results from rotating about the line 
   \[ x = \frac{\pi}{2} \] the region between the curves \( y = \sin(x) \) and \( y = \cos(x) \) over the interval \( \left[ 0, \frac{\pi}{4} \right] \).

12. Use the Washer Method to find the volume of the solid that results from rotating about the line 
   \[ x = \frac{\pi}{2} \] the region between the curves \( y = \sin(x) \) and \( y = \cos(x) \) over the interval \( \left[ 0, \frac{\pi}{4} \right] \).

13. Find the volume of the solid that results from rotating about the line \( x = 10 \) the right half of the 
   circle \( x^2 + y^2 = 25 \).

14. Find the volume of the solid that results from rotating about the line \( x = 10 \) the left half of the circle 
   \( x^2 + y^2 = 25 \).

15. Find the volume of the solid that results from rotating about the line \( x = 10 \) the top half of the circle 
   \( x^2 + y^2 = 25 \).

16. Find the volume of the solid that results from rotating about the line \( x = 10 \) the bottom half of the circle 
   \( x^2 + y^2 = 25 \).

Short Answers (more informative solutions appear on pages 3 and 4)

1. Volume = \( 4\pi \)
2. Volume = \( 4\pi \)
3. Volume = \( 24\pi \)
4. Volume = \( 24\pi \)
5. Volume = \( \frac{625}{6}\pi \)
6. Volume = \( \frac{625}{2}\pi \)
7. Volume = \( 272\pi \)
8. Volume = \( 352\pi \)
9. Volume = \( \frac{320}{3}\pi \)
10. Volume = \( \frac{280}{3}\pi \)
11. Volume \( \approx 3.39 \)
12. Volume \( \approx 3.39 \)
13. Volume = \( \frac{250\pi(3\pi - 2)}{3} \)
14. Volume = \( \frac{250\pi(3\pi + 2)}{3} \)
15. Volume = \( 250\pi^2 \)
16. Volume = \( 250\pi^2 \)