

Name _____

VOLUME Assignment

In problems 1-2, find the volumes generated by revolving the regions bounded by the given lines and curves about the x -axis.

1. $y = -3x - x^2, y = 0$

2. $y = \sec x, x = -\frac{\pi}{4}, x = \frac{\pi}{4}, y = 0$

In problems 3-4, find the volumes generated by revolving the regions bounded by the given lines and curves about the y -axis.

3. $x = 1 - y^2, x = 0$

4. $xy = 1, x = 0, y = 1, y = 2$

5. Find the volume generated by revolving the region bounded by $y = \sqrt{x}$ and the lines $y = 2$ and $x = 0$ about the line $y = 2$.

6. Find the volume generated by revolving the region bounded above by the parabola $y = 3 - x^2$ and below by the line $y = -1$ about the line $y = -1$.

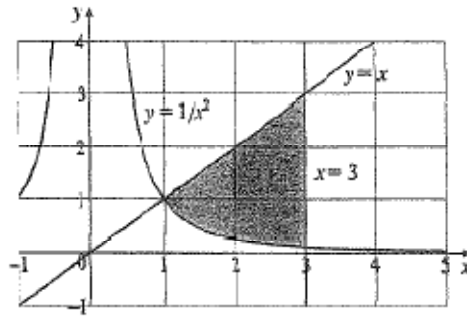
7. Find the volume generated by revolving the region bounded below by the parabola $y = 3x^2 + 1$ and above by the line $y = 4$ about the line $y = 4$.

8. Find the volume generated by revolving the region bounded by the curve $y = x^2$, the line $y = 1$, and the y -axis about the line $y = 1$.

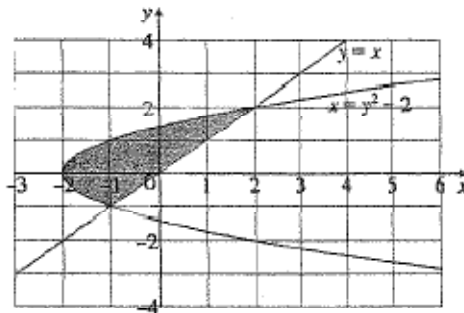
9. Find the volume generated by revolving the region bounded by $y = x^{3/2}$, the x -axis, and the line $x = 1$ about the line $x = 1$.

10. Find the volume generated by revolving the region bounded by $y = \sin x$ and the lines $x = 0, x = \pi$, and $y = 2$ about the line $y = 2$. **Calculator Active**

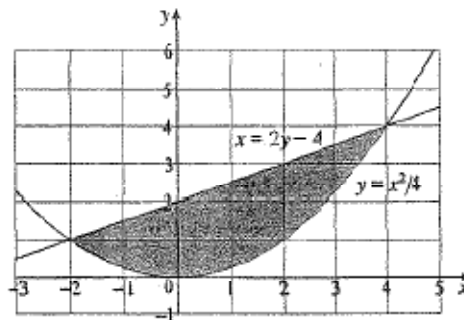
11. Find the area of the shaded region:



12. Find the area of the shaded region:



13. Find the area of the shaded region:



14. A hole of radius 4 is bored through the center of a sphere of radius 5. Find the volume of the remaining portion of the sphere.

15. The volume of a sphere of radius r is $\frac{4}{3}\pi r^3$. Verify this formula by rotating the circle $x^2 + y^2 = r^2$ about the x -axis.

16. Consider the region in the xy -plane between $x = 0$ and $x = \frac{\pi}{2}$, bounded by $y = 0$ and $y = \sin x$. Find the volume of the solid generated by rotating this region about the x -axis.

17. Find the volume of the solid formed when the region bounded by the curves $y = x^3 + 1$, $x = 1$ and $y = 0$ is rotated about the x -axis.

18. Find the volume of the solid generated by rotating about the line $y = -1$ the region bounded by the graphs of the equations $y = x^2 - 4x + 5$ and $y = 5 - x$.