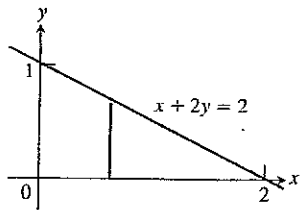
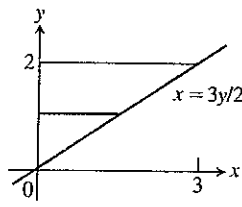


revolving the shaded region about the given axis.

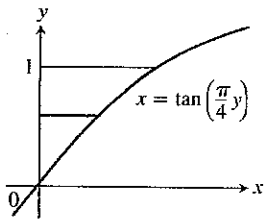
13. about the x -axis



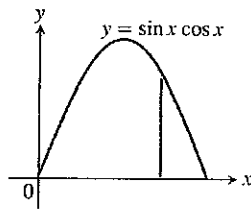
14. about the y -axis



15. about the y -axis



16. about the x -axis



In Exercises 17–26, find the volume of the solid generated by revolving the region bounded by the lines and curves about the x -axis.

17. $y = x^2$, $y = 0$, $x = 2$

18. $y = x^3$, $y = 0$, $x = 2$

19. $y = \sqrt{9 - x^2}$, $y = 0$

20. $y = x - x^2$, $y = 0$

21. $y = x$, $y = 1$, $x = 0$

22. $y = 2x$, $y = x$, $x = 1$

23. $y = x^2 + 1$, $y = x + 3$

24. $y = 4 - x^2$, $y = 2 - x$

25. $y = \sec x$, $y = \sqrt{2}$, $-\pi/4 \leq x \leq \pi/4$

26. $y = -\sqrt{x}$, $y = -2$, $x = 0$

In Exercises 27 and 28, find the volume of the solid generated by revolving the region about the given line.

27. the region in the first quadrant bounded above by the line $y = \sqrt{2}$, below by the curve $y = \sec x \tan x$, and on the left by the y -axis, about the line $y = \sqrt{2}$

28. the region in the first quadrant bounded above by the line $y = 2$, below by the curve $y = 2 \sin x$, $0 \leq x \leq \pi/2$, and on the left by the y -axis, about the line $y = 2$

In Exercises 29–34, find the volume of the solid generated by revolving the region about the y -axis.

29. the region enclosed by $x = \sqrt{5}y^2$, $x = 0$, $y = -1$, $y = 1$

30. the region enclosed by $x = y^{3/2}$, $x = 0$, $y = 2$

31. the region enclosed by the triangle with vertices $(1, 0)$, $(2, 1)$, and $(1, 1)$

$(1, 0)$, and $(1, 1)$

33. the region in the first quadrant bounded above by the parabola $y = x^2$, below by the x -axis, and on the right by the line $x = 2$

34. the region bounded above by the curve $y = \sqrt{x}$ and by the line $y = x$

In Exercises 35–38, work in groups of two or three.

35. Find the volume of the solid generated by revolving the bounded by $y = \sqrt{x}$ and the lines $y = 2$ and $x = 0$:

(a) the x -axis.

(b) the y -axis.

(c) the line $y = 2$.

(d) the line $x = 4$.

36. Find the volume of the solid generated by revolving the triangular region bounded by the lines $y = 2x$, $y = 0$ and $x = 1$ about

(a) the line $x = 1$.

(b) the line $x = 2$.

37. Find the volume of the solid generated by revolving the bounded by the parabola $y = x^2$ and the line $y = 1$ at

(a) the line $y = 1$.

(b) the line $y = 2$.

(c) the line $y = -1$.

38. By integration, find the volume of the solid generated revolving the triangular region with vertices $(0, 0)$, $(b, 0)$, $(0, h)$ about

(a) the x -axis.

(b) the y -axis.

In Exercises 39–42, use the cylindrical shell method to find volume of the solid generated by revolving the region bounded by the curves about the y -axis.

39. $y = x$, $y = -x/2$, $x = 2$

40. $y = x^2$, $y = 2 - x$, $x = 0$, for $x \geq 0$

41. $y = \sqrt{x}$, $y = 0$, $x = 4$

42. $y = 2x - 1$, $y = \sqrt{x}$, $x = 0$

In Exercises 43 and 44, use the cylindrical shell method to find the volume of the solid generated by revolving the shaded region about the indicated axis.

43. (a) the x -axis

(b) the line $y = 1$

(c) the line $y = 8/5$

(d) the line $y = -2/5$

