We have considered only solids of revolution in which a region is rotated about the x-axis. The formula we used would need some adjustment if the region were rotated about some other horizontal line, since the radius of revolution would be represented by some expression other than $f(x)$. Such solids of revolution will not be considered in this course.

7.6 EXERCISES

PRACTICE

Find the volume of the solid generated when the region bounded by the graphs of the given equations and the x-axis is rotated about the x-axis.

1. $y = x,\ x = 0,\ x = 2$

2. $y = 3x,\ x = 1,\ x = 3$

3. $y = 2\sqrt{x},\ x = 0,\ x = 4$

4. $y = \sqrt[3]{x},\ x = 0,\ x = 8$

5. $y = e^{x},\ x = -1,\ x = 2$

6. $y = e^{-x},\ x = -1,\ x = 2$

7. $y = 1 + e^{-x},\ x = 0,\ x = 3$

8. $y = x^{3} + 1,\ x = 0,\ x = 2$

9. $y = 6 - x^{2},\ x = -1,\ x = 2$

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

11. $y = 1 - x^{2},\ x = -1,\ x = 1$

12. $y = 4 - x^{2},\ x = -2,\ x = 2$

13. $y = \left(16 - x^{2}\right)^{\frac{1}{2}},\ x = 0,\ x = 4$

14. $y = \sqrt{3 - x^{2}},\ x = 0,\ x = 1$

15. $y = \sqrt{9 - x^{2}},\ x = 0,\ x = 3$

16. $y = \dfrac{4}{x},\ x = 1,\ x = 3$

17. $y = \dfrac{2}{x},\ x = 1,\ x = 2$

18. $y = \dfrac{1}{\sqrt{x}},\ x = 1,\ x = 6$

19. $y = \dfrac{2}{\sqrt{x}},\ x = 1,\ x = 5$

20. $y = x + \sqrt{x},\ x = 1,\ x = 4$

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

22. $y = 16\left(x - x^{3}\right),\ x = 0,\ x = 1$

23. $y = 2 + x + x^{2},\ x = 0,\ x = 1$

24. $y = \left(5 - x\right)e^{0.5x},\ x = 0,\ x = 2$

25. Determine the volume, if finite, of the solid of revolution formed when the region between $y = 12e^{-3x}$ and the x-axis on the interval $[0, +\infty)$ is revolved about the x-axis.