Answers for Lesson 11-5, pp. 634–636 Exercises

1. about 233,333 ft^3

2. 200 cm^3

3. 1296 $in.^3$

4. 50 m^3

5. about 443.7 cm^3

6. 300 $in.^3$

7. 2048 m^3

8. about 363.6 m^3

9. about 3714.5 mm^3

10. about 562.9 ft^3

11. $\frac{16}{3}\pi$ ft^3; 17 ft^3

12. $\frac{22}{3}\pi$ $in.^3$; 23 $in.^3$

13. 36.75π $in.^3$; 115 $in.^3$

14. about 66.4 cm^3

15. about 4.7 cm^3

16. 123 $in.^3$

17. 312 cm^3

18. 10,368 ft^3

19. They are equal; both volumes are $\frac{1}{3}\pi r^2 h$.

20. **a.** 6,312,000 ft^3

b. 284 ft

21. 6

22. 3

23. $3\sqrt{2}$

24. 73 cm^3

25. B

26. cube: 8 $units^3$, cone: $\frac{2}{3}\pi$ $units^3$, pyramid: $\frac{8}{3}$ $units^3$

27. **a.** 120π ft^3

b. 60π ft^3

c. 240π ft^3

28. cone: 234.6 $in.^3$; prism: 240 $in.^3$; pyramid: 256 $in.^3$

29. cone with $r = 4$ and $h = 3$; 16π

30. cone with $r = 3$ and $h = 4$; 12π

31. cylinder with $r = 4, h = 3$, with a cone of $r = 4$, $h = 3$ removed from it; 32π

32. cone with $r = 4, h = 5\frac{1}{3}$, with a cone of $r = 1, h = 1\frac{1}{3}$ cut off the top, and a cylinder of $r = 1, h = 4$ cut out of its center; 24π

33. a. The frustum has vol. $V = \frac{1}{3}\pi R^2H - \frac{1}{3}\pi r^2h = \frac{1}{3}\pi(R^2H - r^2h)$. Now if $h_1 = H - h$ is the frustum's height, $V = \frac{1}{3}\pi(R^2(h_1 + h) - R^2h) = \frac{1}{3}\pi(R^2h_1 + h(R^2 - r^2))$. By similar $\triangle$s, $\frac{h}{r} = \frac{h_1 + h}{R}$, or $h = \frac{rh_1}{R - r}$. Simplifying, $V = \frac{1}{3}\pi h_1(r^2 + rR + R^2)$.

b. about 784.6 in.^3

34. a. about 47.1 m

b. about 176.7 m^2

c. about 389.6 m^3

35. about 16.2 cm

36. about 8.8 cm