Self-Test 2, Page 465

1. 88; 616 **2.** 81π **3. a.** 6π **b.** 36π **c.** $36\pi - 72$ **4.** 16:49 **5.** 2:3 **6. a.** 4:9 **b.** 3:2 **7.** $64 - 16\pi$ **8.** $36\pi - 27\sqrt{3}$ **9.** $\frac{3}{5}$ **10.** $\frac{\pi}{4}$

Extra, Page 466

Answers may vary in Exs. 1–8. **1.** 55.2 **3.** 39.7 **5.** 75.3 **7.** 178.2

Chapter Review, Page 470

1. 64 **3.** 18 cm^2 **5.** 9 **7.** 7 **9.** $30 + 4\sqrt{2}$; 52 **11.** $9\sqrt{3}$ **13.** 188.4; 2826 **15.** $8\pi\sqrt{2}$; 32π **17.** $24\pi + 9\sqrt{3}$ **19.** 16π **21.** 1:4 **23.** $\frac{9}{25}$

Cumulative Review, Pages 472–473

1. False **3.** False **5.** False **7.** True **9.** True **11.** False **13.** $\parallel$, skew **15.** -45 **17.** 5 **19.** a sphere with ctr. P and radius 4 cm, along with its interior **21.** Key steps of proof: 1. $\triangle ABC \cong \triangle DCB$ (HL) 2. $\angle 1 \cong \angle 2$ (CPCT) 3. $\overline{CE} \cong \overline{BE}$ (Thm. 4-2) 4. $\triangle BCE$ is isos. (Def. isos. $\triangle$) **23.** Assume temp. that there is a $\triangle$ whose sides have lengths x, y, and $x + y$, then the length of the longest side equals the sum of the lengths of the other two sides. This contradicts the $\triangle$ Ineq. Thm., if 2 sides of a triangle have lengths x and y, then the third side must be greater than $x + y$. Therefore, the temp. assumption must be false. It follows that no $\triangle$ has sides of length x, y, and $x + y$. **25.** 5 **27.** 4.5 **29.** 17 **31.** 61 **33.** Const. a seg. of length $2x$. Use Const. 13 with $a = y$, $b = 2x$, and $c = x$ to find a seg. with length t; $\frac{y}{2x} = \frac{x}{t}$; $ty = 2x^2$; $t = \frac{2x^2}{y}$. **35.** $32\sqrt{6}$ **37. a.** 46 **b.** $\frac{1}{4}$

Chapter 12

Written Exercises, Pages 478–480

1. 40; 88; 48 **3.** 3; 54; 90 **5.** 6, 168, 108 **7.** 54; 27 **9.** 10; 600 **11.** 5; 125 **13.** 390 **15.** 4; 8 **17.** 240; $240 + 32\sqrt{3}$; $160\sqrt{3}$ **19.** 252; 372; 420 **21.** 180; 228; 216 **23.** 675 cm^3 **25.** 1.8 kg **27.** 19 kg **29.** $50x^3$; $120x^2$ **31.** 198 cm^2 **33.** ≈ 336 **35.** $V = Bh = \frac{1}{2}aph =$ $\frac{1}{2} \cdot \frac{x\sqrt{3}}{6} \cdot 3x \cdot x = \frac{1}{4}x^3\sqrt{3}$ **39.** 6 cm

Written Exercises, Pages 485–487

1. 6; $\sqrt{34}$ **3.** 25; $\sqrt{674}$ **5.** 3; $\sqrt{41}$ **7.** 36 **9.** 192 **11.** 60; 96; 48 **13.** 260; 360; 400 **15.** 6 cm **17. a.** 15 cm; 13 cm **b.** 384 cm^2 (*V-ABCD* is not reg.) **19.** Vol. pyr. $= \frac{1}{6} \cdot$ vol. rect. solid **21.** 8; $\sqrt{73}$ **23. a.** 3; 6; $6\sqrt{3}$ **b.** $45\sqrt{3}$; $36\sqrt{3}$ **25.** 144; $24\sqrt{39}$ **27.** ≈ 66 cubic units **29.** $\frac{x^3\sqrt{2}}{12}$ **31.** 246

Mixed Review Exercises, Page 487

1. 12π; 36π **2.** 22π; 121π **3.** π; $\frac{\pi}{4}$ **4.** $6\pi\sqrt{3}$; 27π **5.** 5; 25π **6.** 9; 81π **7.** 7; 14π **8.** $\sqrt{15}$; $2\pi\sqrt{15}$ **9. a.** 144π mm^2 **b.** 576 mm^2 **10. a.** 32 **b.** $8\pi\sqrt{2}$

Written Exercises, Pages 492–495

1. 40π; 72π; 80π **3.** 24π; 56π; 48π **5.** 4 **7.** 48π **9.** 5; 20π; 36π; 16π **11.** 5; 156π; 300π; 240π **13.** 12; 9; 324π; 432π **15.** 8; 17; 255π; 480π **17. a.** 1:4 **b.** 1:4 **c.** 1:8 **19.** 1:3 **21.** 24 cm **23.** 25 min **25.** 2 **27. a.** cyl. with $r = 6$, $h = 10$; $V = 360\pi$ **b.** cyl. with $r = 10$, $h = 6$; $V = 600\pi$ **29. a.** $270\sqrt{3}$; $180\sqrt{3}$ **b.** 720; $240\sqrt{2}$ **c.** $540\sqrt{3}$; 360 **31.** cyl. with $r = s$, $h = s$; $V = \pi s^3$ **33.** 16π cm^3 **35.** $18\pi\sqrt{2}$ cm^3 **37.** 60π; $18\sqrt{91}$ **39.** 1200π