# Chapter 8

### Written Exercises, Pages 288–290

**1.** $2\sqrt{3}$ **3.** $3\sqrt{5}$ **5.** $20\sqrt{2}$ **7.** $18\sqrt{10}$ **9.** $6\sqrt{5}$ **11.** $\frac{\sqrt{21}}{7}$ **13.** $6\sqrt{3}$ **15.** $\frac{\sqrt{3}}{9}$ **17.** 9 **19.** $10\sqrt{10}$ **21.** $11\sqrt{10}$ **23.** 9 **25.** $3\sqrt{5}$ **27.** 9 **29.** 3 **31.** $x = 10, y = 2\sqrt{29}, z = 5\sqrt{29}$ **33.** $x = \frac{\sqrt{2}}{6}, y = \frac{\sqrt{3}}{6}, z = \frac{\sqrt{6}}{6}$ **35.** $x = 5.4, y = 9.6, z = 7.2$ **37.** $x = \sqrt{2}, y = 2, z = \sqrt{2}$ **39.** $x = 4, y = 2\sqrt{5}, z = 3\sqrt{5}$ **41. a.** $cd, ce$ **b.** $a^2 + b^2 = cd + ce = c(d + e) = c^2$ **43.** Key steps of proof: 1. $\triangle PST \sim \triangle TRQ$ (SAS~) 2. $m\angle PTS = m\angle TQR$ (Corr. $\measuredangle$ of $\sim$ $\triangle$ are $\cong$.) 3. $m\angle QTR + m\angle TQR = 90$ (Thm. 3-11 Cor. 4) 4. $m\angle PTS + m\angle QTR = 90$ (Subst.) 5. $m\angle PTQ + m\angle PTS + m\angle QTR = 180$ and $m\angle PTQ = 90$ ($\angle$ Add. Post.)

### Written Exercises, Pages 292–294

**1.** 5 **3.** 8 **5.** $10\sqrt{3}$ **7.** 8 **9.** 25 **11.** $8\sqrt{2}$ **13.** 3 **15.** $4\sqrt{2}$ **17.** 68 **19.** 3 **21.** $3\sqrt{5}$ **23.** 12 **25.** 10 **27.** 17 **29.** 20 **31. a.** 5 **b.** 4.8 **33.** 13 **35.** $e\sqrt{3}$ **37.** 12 **39.** 12

### Mixed Review Exercises, Page 294

**1.** $AC$ **2.** $>, A$ **3.** $>$ **4.** $\overline{AB}$ **5.** $B, C$ **6.** $AB$ **7.** $BX, CX$

### Written Exercises, Pages 297–298

**1.** acute **3.** rt. **5.** obt. **7. a.** rt. **b.** rt. **9.** $(ST)^2 = 13^2 - 12^2 = 25$; $(ST)^2 = (RS)^2 + (RT)^2 = 25$. By the conv. of the Pythag. Thm., $\triangle RST$ is a rt. $\triangle$. **11.** acute **13.** obt. **15.** $12 < x \leq 16$ **17.** $\overline{RM}$; $\angle RST$ is obt. and $\angle STU$ is acute, so $RT > SU$. **19. a.** is greater than the sum of the squares of the other 2 sides, then the $\triangle$ is an obt. $\triangle$. **b.** 1. $n^2 = j^2 + k^2$ (Pythag. Thm.) 2. $l^2 > j^2 + k^2$ (Given) 3. $l^2 > n^2$ and $l > n$ (Subst.) 4. $m\angle S > m\angle V = 90$ (SSS Ineq. Thm.) 5. $\triangle RST$ is obt. $\triangle$. (Def. of obt. $\triangle$)

### Written Exercises, Pages 302–303

**1.** 4; $4\sqrt{2}$ **3.** $\sqrt{5}$; $\sqrt{10}$ **5.** $3\sqrt{2}$; $3\sqrt{2}$ **7.** $4\sqrt{2}$; 8 **9.** $7\sqrt{3}$; 14 **11.** 5; 10 **13.** 5; $5\sqrt{3}$ **15.** $\sqrt{3}$; $2\sqrt{3}$ **17.** $12\sqrt{2}$ **19.** 36 **21.** $x = 4, y = \frac{4\sqrt{3}}{3}$ **23.** $x = 6\sqrt{2}, y = 12$ **25.** $x = 8\sqrt{2}$, $y = 4\sqrt{6}$ **27.** $OB = \sqrt{2}, OC = 2, OD = 2\sqrt{2}, OE = 4$ **29.** 16, $16\sqrt{3}$ **31.** A $30°-60°-90°$ $\triangle$ with hyp. 2 has legs 1 and $\sqrt{3}$. Any $\triangle$ with sides in ratio $1:\sqrt{3}:2$ is $\sim$ to this $30°-60°-90°$ $\triangle$ and thus is a $30°-60°-90°$ $\triangle$. **33.** $GH = GI = 6, JG = 6\sqrt{3}, HI = 6\sqrt{2}, JH = 12$ **35. a.** $4\sqrt{2} + 4\sqrt{6}$ **b.** $(1 + \sqrt{3}):2$ **37.** $\frac{3j + j\sqrt{3}}{4}$ **39.** $4\sqrt{2}$

### Self-Test 1, Page 304

**1.** $3\sqrt{5}$ **2. a.** 4 **b.** $2\sqrt{5}$ **c.** $4\sqrt{5}$ **3. a.** rt. **b.** acute **c.** obtuse **4.** $4\sqrt{5}$ **5.** $20\sqrt{2}$ cm **6.** $6\sqrt{3}$ cm **7.** 12

### Written Exercises, Pages 308–310

**1.** 13.7 **3.** 48.3 **5.** 55.4 **7.** 57° **9.** 27° **11.** 31° **13.** $w = 60, z \approx 54$ **15.** $w = 75$, $z \approx 89$ **17.** $w = 160, z \approx 117$ **19.** about 4° **21.** 65° **23.** 174 cm **25. a.** 0.7002, 0.4663, 1.1665 **b.** 60°, 1.7321 **c.** No **d.** No **27. a.** 5 **b.** 22° **29.** about 136 ft

### Written Exercises, Pages 314–316

**1.** $x \approx 21, y \approx 28$ **3.** $x \approx 89, y \approx 117$ **5.** $x \approx 28, y \approx 10$ **7.** $v° \approx 26°$ **9.** $x \approx 9, v° \approx 63°$ **11.** $v° \approx 37°, w° \approx 106°$ **13. a.** $\sqrt{115}$ **b.** $y \approx 40, x \approx 10.7$ **c.** Yes; $\sqrt{115} \approx 10.7$ **15.** about 149 m **17.** 0.4 m **19. a.** $AB = AC \approx 16$ **b.** $\approx 15$ **21.** length $\approx$ 17 cm, width $\approx$ 5 cm **23.** about 12 cm

### Written Exercises, Pages 318–320

**1.** about 32 m **3.** about 50 m **5.** about 2.3 km **7.** Heidi; $\approx$ 63 cm longer **9.** about 440 m **11.** $\approx 14°$ **13. a.** $\angle A$ **b.** $A$; a player at $A$ has a wider $\angle$ over which to aim at the goal.