Written Exercises, Pages 180–182

1. 12, 12 **3.** 4 **5. a.** 40 **b.** 20 **c.** 26 **d.** 34 **7.** D, E **9.** D, F **11.** 6 **13.** 11

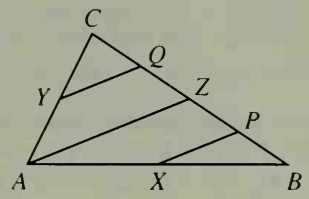
15. 3, 2 **17.** $x = 4, y = 2$ **19.** 1. $\overline{BE} \parallel \overline{MD}$; M is the midpt. of $\overline{AB}$. (Given) 2. D is the midpt. of $\overline{AE}$. (Thm. 5-10) 3. $\overline{DE} \cong \overline{AD}$ (Def. of midpt.) 4. $ABCD$ is a $\square$. (Given) 5. $\overline{AD} \cong \overline{BC}$ (Thm. 5-1) 6. $DE = BC$ (Trans. Prop.)

23. Given: X, Y, and Z are the midpts. of $\overline{AB}$, $\overline{AC}$, and $\overline{BC}$, resp.; P and Q are midpts. of $\overline{BZ}$ and $\overline{CZ}$, resp.

Prove: $PX = QY$

Key steps of proof: 1. $PX = \frac{1}{2}AZ$; $QY = \frac{1}{2}AZ$ (Thm. 5-11, part (2))

2. $PX = QY$ (Subst.)



Self-Test 1, Page 182

1. may be **2.** must be **3.** must be **4.** cannot be **5.** See page 172. **6. a.** If 3 $\parallel$ lines cut off $\cong$ seg. on one trans., then they cut off $\cong$ seg. on every trans. **b.** $x = 6, y = 19$ **7.** 1. $ABCD$ is a $\square$. (Given) 2. $\overline{AC}$ and $\overline{BD}$ bis. each other. (Diags. $\square$ bis. each other.) 3. O is the midpt. of $\overline{BD}$. (Def. of bis.) 4. M is the midpt. of $\overline{AB}$. (Given) 5. $MO = \frac{1}{2}AD$ (Thm. 5-11) **8.** 1. $PQRS$ is a $\square$. (Given) 2. $\overline{SR} \parallel \overline{PQ}$; $\overline{SP} \parallel \overline{RQ}$ (Def. of $\square$) 3. $m\angle QPR = m\angle SRP$ (If lines $\parallel$, alt. int. $\measuredangle \cong$.) 4. $\overline{PX}$ bis. $\angle QPR$; $\overline{RY}$ bis. $\angle SRP$. (Given) 5. $m\angle RPX = \frac{1}{2}m\angle QPR$; $m\angle PRY = \frac{1}{2}m\angle SRP$ ($\angle$ Bis. Thm.) 6. $\frac{1}{2}m\angle QPR = \frac{1}{2}m\angle SRP$ (Mult. Prop. of $=$) 7. $m\angle RPX = m\angle PRY$ (Subst.) 8. $\overline{YR} \parallel \overline{PX}$ (If alt. int. $\measuredangle \cong$, lines $\parallel$.) 9. $RYPX$ is a $\square$. (Def. of $\square$)

Written Exercises, Pages 187–189

1. all **3.** all **5.** all **7.** rhom., sq. **9.** rect., sq. **11.** 25, 65, 65, 90 **13.** 10 **15.** $13\frac{1}{2}$

17. 32, 58, 58 **19.** $\frac{1}{2}$ **21.** (2, 5); no **23.** (4, 6); yes **25.** 15 **27.** 60 **29.** 1. $ABZY$ is a $\square$. (Given) 2. $\overline{BZ} \cong \overline{AY}$ (Thm. 5-1) 3. $\overline{AY} \cong \overline{BX}$ (Given) 4. $\overline{BZ} \cong \overline{BX}$ (Trans. Prop.) 5. $\angle 1 \cong \angle 2$ (Isos. $\triangle$ Thm.) 6. $\overline{BZ} \parallel \overline{AY}$ (Def. of $\square$) 7. $\angle 2 \cong \angle 3$ (If lines $\parallel$, corr. $\measuredangle$ are $\cong$.) 8. $\angle 1 \cong \angle 3$ (Trans. Prop.)

31. 1. $QRST$ is a rect.; $RKST$ and $JQST$ are $\boxdot$. (Given) 2. $\overline{KS} \cong \overline{RT}$; $\overline{JT} \cong \overline{QS}$ (Thm. 5-1) 3. $\overline{RT} \cong \overline{QS}$ (Diags. of rect. $\cong$.) 4. $\overline{JT} \cong \overline{KS}$ (Subst.) **37.** square **39.** 6, 8

Mixed Review Exercises, Page 189

1. 13 **2.** 20 **3.** 11 **4.** 9 **5.** 8.2 **6.** -1.5 **7.** 1 **8.** 3.45 **9. a.** 23 **b.** 2 **c.** 4 **d.** -6

Written Exercises, Pages 192–194

1. 12 **3.** 15 **5.** 9 **7.** 4 **9.** 6 **11.** $x = 10$; 40, 40, 140, 140 **13.** $BE = \frac{1}{2}(AD + CF)$

15. 13, 39 **17.** 9, 15 **19.** $CF = 3 \cdot AD$, but $17 \neq 3 \cdot 5$. **21.** rect. **23.** rhom. **25.** $\square$

27. Given: Trap. $ABXY$ with $\overline{BX} \cong \overline{AY}$

Prove: $\angle 1 \cong \angle 3$; $\angle ABX \cong \angle A$

Key steps of proof: 1. $ABZY$ is a $\square$. (Def. of $\square$) 2. $\angle 1 \cong \angle 2$ (Isos. $\triangle$ Thm.) 3. $\angle 2 \cong \angle 3$ (If lines $\parallel$, corr. $\measuredangle \cong$.) 4. $\angle 1 \cong \angle 3$ (Trans. Prop.) 5. $\angle ABX \cong \angle A$ (Supps. of $\cong$ $\measuredangle$ are $\cong$.) **29. a.** rect. **b.** rect. **33.** rhom. **35. a.** Drawings may vary. **b.** The diags. must be $\cong$.