### Written Exercises, Pages 63–65

**1.** Seg. Add. Post. **3.** Vertical $\measuredangle$ are $\cong$. **5.** Def. of $\angle$ bis. **7.** Def. of $\perp$ lines **9.** Def. of comp. $\measuredangle$ **11.** If 2 lines are $\perp$, then they form $\cong$ adj. $\measuredangle$. **13.** Def. of $\perp$ lines **15.** 1. $\angle 5$ are supplementary; Given 2. Def. of supp. $\measuredangle$ 3. Substitution Prop. 5. Subtr. Prop. of = **17. a.** 1. Given 2. If the ext. sides of 2 adj. acute $\measuredangle$ are $\perp$, then the $\measuredangle$ are comp. 3. Given 4. If 2 $\measuredangle$ are comp. of $\cong \measuredangle$, then the 2 $\measuredangle$ are $\cong$. **b.** Show that $\angle 3$ and $\angle 6$ are supps. of $\cong \measuredangle$. **19.** 1. $\angle 2 \cong \angle 3$ (Given) 2. $\angle 1 \cong \angle 2$ (Vert. $\measuredangle$ are $\cong$.) 3. $\angle 1 \cong \angle 3$ (Substitution Prop.) 4. $\angle 3 \cong \angle 4$ (Vert. $\measuredangle$ are $\cong$.) 5. $\angle 1 \cong \angle 4$ (Trans. Prop.)

**21.** 1. $\overline{AC} \perp \overline{BC}$ (Given) 2. $\angle 2$ is comp. to $\angle 1$. (If the ext. sides of 2 adj. acute $\measuredangle$ are $\perp$, then the 2 $\measuredangle$ are comp.) 3. $\angle 3$ is comp. to $\angle 1$ (Given) 4. $\angle 3 \cong \angle 2$ (If 2 $\measuredangle$ are comp. of the same $\angle$, then the 2 $\measuredangle$ are $\cong$.) **23.** $\overrightarrow{OF}$ bisects $\angle COD$. Proof: 1. $\overrightarrow{OE}$ bisects $\angle AOB$. (Given) 2. $\angle 1 \cong \angle 2$ (Def. of $\angle$ bis.) 3. $\angle 2 \cong \angle 3$ (Vert. $\measuredangle$ are $\cong$.) 4. $m\angle 1 = m\angle 3$ (Trans. Prop.) 5. $m\angle 1 = m\angle 4$ (Vert. $\measuredangle$ are $\cong$.) 6. $m\angle 3 = m\angle 4$ (Substitution Prop.) 7. $\overrightarrow{OF}$ bisects $\angle COD$. (Def. of $\angle$ bis.)

### Self-Test 2, Page 65

**1.** Answers may vary; $90 \leq m\angle HOK < 180$ **2. a.** 15 **b.** 40 **3.** 53; 37; 53 **4.** $m\angle 4 = 90 - t$, $m\angle 5 = t$, $m\angle 6 = 90 - t$ **5.** Def. of $\perp$ lines **6.** Vert. $\measuredangle$ are $\cong$. **7.** If the ext. sides of 2 adj. $\measuredangle$ are $\perp$, then the $\measuredangle$ are comp. **8.** Show that $\angle 1 \cong \angle 2$, so $j \perp k$. **9.** 1. $\angle 1$ is supp. to $\angle 3$; $\angle 2$ is supp. to $\angle 3$ (Given) 2. $\angle 1 \cong \angle 2$ (If 2 $\measuredangle$ are supp. of the same $\angle$, the 2 $\measuredangle$ are $\cong$.) 3. $j \perp k$ (If 2 lines form $\cong$ adj. $\measuredangle$, then the lines are $\perp$.)

### Extra, Page 66

**1.** None of it; one **3.** 2; the result is 2 non-Möbius (2-sided) bands linked together. **5.** The result is a rectangular frame.

### Chapter Review, Pages 67–68

**1.** H: $m\angle 1 = 120$, C: $\angle 1$ is obtuse **3.** Answers may vary; $m\angle 1 = 100$ **5.** Substitution Prop. **7.** Div. Prop. of = **9.** Def. of midpt. **11.** $\angle$ Bis. Thm. **13.** $\angle BOA$ or $\angle DOE$ **15.** Def. of $\perp$ lines **17.** If 2 lines are $\perp$, then they form $\cong$ adj. $\measuredangle$. **19.** Show that $\angle 3$ and $\angle 4$ are supp. of $\cong \measuredangle$.

### Algebra Review, Page 69

**1.** $x = 3, y = 9$ **3.** $x = -16, y = -8$ **5.** $x = 28, y = 4$ **7.** $x = 1, y = 6$ **9.** $x = 5, y = 4$ **11.** $x = -2, y = 3$ **13.** $x = 4, y = 1$ **15.** $x = 6, y = 2$ **17.** $x = 11, y = 16$

### Preparing for College Entrance Exams, Page 70

**1.** C **2.** C **3.** D **4.** E **5.** D **6.** B **7.** E **8.** C

### Cumulative Review, Page 71

**1.** Div. Prop. of = **3.** Def. of $\perp$ lines **5.** Subtr. Prop. of = **7.** If 2 planes int., then their int. is a line. **9.** Seg. Add. Post. **11.** True **13.** False **15.** False; 3 collinear pts. **17.** True **19.** True **21.** $x = 36$ **23.** $x = 10$ **25.** $x = 31$

## Chapter 3

### Written Exercises, Pages 76–77

**1.** alt. int. $\measuredangle$ **3.** s-s. int. $\measuredangle$ **5.** corr. $\measuredangle$ **7.** $\overleftrightarrow{PQ}$, $\overleftrightarrow{SR}$; $\overleftrightarrow{SQ}$ **9.** $\overleftrightarrow{PQ}$, $\overleftrightarrow{SR}$; $\overleftrightarrow{PS}$ **11.** $\overleftrightarrow{PQ}$, $\overleftrightarrow{SR}$; $\overleftrightarrow{QR}$ **13.** corr. $\measuredangle$ **15.** s-s. int. $\measuredangle$ **17.** corr. $\measuredangle$ **19.** Alt. int. $\measuredangle$ are $\cong$. **21. a.** Answers may vary. **b.** Same as $m\angle 1 + m\angle 2$ **c.** Same as $m\angle 1 + m\angle 2$ **d.** When 2 nonparallel lines are cut by trans., the sum of the meas. of s-s. int. $\measuredangle$ is a constant. **23.** $\overleftrightarrow{BH}$, $\overleftrightarrow{CI}$, $\overleftrightarrow{DJ}$, $\overleftrightarrow{EK}$, $\overleftrightarrow{FL}$ **25.** Answers may vary. $\overleftrightarrow{FL}$, $\overleftrightarrow{EK}$, $\overleftrightarrow{DJ}$, $\overleftrightarrow{CI}$, $\overleftrightarrow{GL}$, $\overleftrightarrow{LK}$, $\overleftrightarrow{JI}$, $\overleftrightarrow{IH}$ **27.** $ABHG$, $BCIH$, $CDJI$, $DEKJ$ **29.** If the top and bottom lie in $\parallel$ planes, then $\overline{CD}$ and $\overline{IJ}$ are the lines of intersection of $DCIJ$ with 2 $\parallel$ planes, and are therefore $\parallel$. **31.** sometimes **33.** always **35.** sometimes **37.** always **39.** sometimes

### Written Exercises, Pages 80–82

**1.** $\angle 3$, $\angle 6$, $\angle 8$ **3.** $\angle 4$, $\angle 5$, $\angle 7$, $\angle 10$, $\angle 12$, $\angle 13$, $\angle 15$ **5.** 110, 70 **7.** $x = 60, y = 61$ **9.** $x = 60, y = 18$ **11.** $x = 14, y = 9$ **13.** 1. Given 2. Def. of $\perp$ lines 3. $l \parallel n$ 4. If 2 $\parallel$ lines are cut by a trans., then corr. $\measuredangle$ are $\cong$. 5. $m\angle 2 = 90$ 6. Def. of $\perp$ lines **15.** $x = 70, y = 12, z = 38$