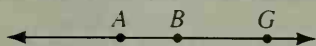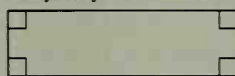# Chapter 2

Written Exercises, Page 35

1. H: $3x - 7 = 32$. C: $x = 13$ **3.** H: you will. C: I'll try **5.** H: $a + b = a$. C: $b = 0$ **7.** B is between A and C if and only if $AB + BC = AC$. **9.** If points are collinear, then they all lie in 1 line. If points lie in 1 line, then they are collinear. Answers may vary in Exs. 11–15. **11.** $a = 1, b = -1$
13.

15.

17. True. If $|x| = 6$, then $x = -6$; false. **19.** True. If $5b > 20$, then $b > 4$; true. **21.** True. If Pam lives in Illinois, then she lives in Chicago; false. **23.** True. If $a^2 > 9$, then $a > 3$; false. **25.** False. If $n > 7$, then $n > 5$; true. **27.** False. If $DE + EF = DF$, then points D, E, and F are collinear; true. **29.** Two $\triangle$ are $\cong$ if and only if their measures are $=$. **31.** Possible conclusions are: q, not r, s.

Mixed Review Exercises, Page 37

1. $\overline{AM}$; $\overline{MB}$ **2.** $\angle ABX$; $\angle XBC$ **3.** AOB; BOC; AOC **4.** POR; ROQ; 180

Written Exercises, Pages 41–43

1. Given; Add. Prop. of $=$; Div. Prop. of $=$ **3.** Given; Mult. Prop. of $=$; Subtr. Prop. of $=$ **5.** Given; Mult. Prop. of $=$; Dist. Prop.; Add. Prop. of $=$; Div. Prop. of $=$ **7.** 1. $\angle$ Add. Post 2. $\angle$ Add. Post. 3. $m\angle AOD = m\angle 1 + m\angle 2 + m\angle 3$; Substitution Prop. **9.** 1. Given 2. OW, WN; Seg. Add. Post. 3. $DO + OW = OW + WN$ 4. Refl. Prop. 5. $DO = WN$; Subtr. Prop. of $=$ **11.** 1. $m\angle 1 = m\angle 2$; $m\angle 3 = m\angle 4$ (Given) 2. $m\angle 1 + m\angle 3 = m\angle 2 + m\angle 4$ (Add. Prop. of $=$) 3. $m\angle 1 + m\angle 3 = m\angle SRT$; $m\angle 2 + m\angle 4 = m\angle STR$ ($\angle$ Add. Post.) 4. $m\angle SRT = m\angle STR$ (Substitution Prop.) **13.** 1. $RQ = TP$; (Given) 2. $RZ + ZQ = RQ$; $TZ + ZP = TP$ (Seg. Add. Post.) 3. $RZ + ZQ = TZ + ZP$ (Substitution Prop.) 4. $ZQ = ZP$ (Given) 5. $RZ = TZ$ (Subtr. Prop. of $=$) **15.** b

Written Exercises, Pages 46–47

1. Def. of midpt. **3.** Def. of $\angle$ bis. **5.** Def. of midpt. **7.** $\angle$ Add. Post. **9.** 60 **11.** 70
13. a. 12 **b.** 28 **c.** 6 **d.** 22 **15. a.** $\overline{LM}$ and $\overline{MK}$, $\overline{GN}$ and $\overline{NH}$ **b.** Answers may vary; for example, $\overline{LK} \cong \overline{GH}$ **17.** $AC = BD$ **19.** 1. Given 2. Ruler Post. 3. Given 4. Def. of Midpt. 5. Substitution Prop. 6. $a + b$; Add. Prop. of $=$ 7. Div. Prop. of $=$ **21.** Q: $\dfrac{3a + b}{4}$; T: $\dfrac{5a + 3b}{8}$

Self-Test 1, Page 49

1. H: $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect; C: $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect. False **2.** If $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect, then $\overline{AB}$ and $\overline{CD}$ intersect. **3.** $\overline{AB} \cong \overline{CD}$ if and only if $AB = CD$. **4.** Answers may vary; $m\angle A = 95$ **5.** Substitution Prop. **6.** $x = 3$ **7.** 81 **8.** definitions, postulates

Written Exercises, Pages 52–54

1. 70, 160 **3.** $90 - x$, $180 - x$ **5.** 45, 45 **7.** $\angle AFD$ **9.** $\angle AFD$ and $\angle AFB$ **11.** $\angle BFC$ and $\angle EFD$ **13.** 35 **15.** 25 **17.** 60 **19.** 25 **21.** 25 **23.** 1. Vertical $\triangle$ are $\cong$. 2. Given 3. Vert. $\triangle$ are $\cong$. 4. $\angle 1 \cong \angle 4$ **25.** $x = 60$, $m\angle A = 76$, $m\angle B = 104$ **27.** $y = 24$, $m\angle C = 16$, $m\angle D = 74$ **29.** $x = \dfrac{1}{2}(90 - x)$; 30 **31.** $180 - x = 6(90 - x)$; 72; 108; 18
33. $x = 33$, $y = 66$

Written Exercises, Pages 58–60

1. a. $90 - x$ **b.** $180 - x$ **3.** Def. of $\perp$ lines **5.** If the ext. sides of 2 adj. $\triangle$ are $\perp$, then the $\triangle$ are comp. **7.** Def. of $\perp$ lines **9.** 35 **11.** 20 **13.** 1. Given 3. $\angle$ Add. Post. 4. $m\angle AOB + m\angle BOC = 90$ 5. $\angle AOB$ and $\angle BOC$ are comp. $\triangle$. **15.** $180 - y$ **17.** $90 - (x + y)$ **19.** No
21. No **23.** Yes **25.** No **27.** Answers may vary. $m\angle 2 = m\angle 3$; $m\angle DAC = 90$; $m\angle ECA = 90$
29. $\overleftrightarrow{XD} \perp \overleftrightarrow{XF}$

Mixed Review Exercises, Page 60

Answers may vary in Exs. 1–7. **1.** $\angle CBF \cong \angle BCG$ **2.** $AC = BD$ **3.** $\angle 3 \cong \angle 4$ **4.** $m\angle 1 = m\angle 2 = 45$ **5.** $CE = BE$ **6.** $\overleftrightarrow{AB} \perp \overleftrightarrow{BF}$ **7.** $m\angle 5 = 90$