# **Chapter 3 Answers**

### Practice 3-1

1. corresponding angles 2. alternate interior angles **3.** same-side interior angles **4.** alternate interior angles 5. same-side interior angles **6.** corresponding angles **7.**  $\angle 1$  and  $\angle 5$ ,  $\angle 2$  and  $\angle 6$ ,  $\angle 3$  and  $\angle 8$ ,  $\angle 4$  and  $\angle 7$ **8.**  $\angle 4$  and  $\angle 6$ ,  $\angle 3$  and  $\angle 5$ **9.**  $\angle 4$  and  $\angle 5$ ,  $\angle 3$  and  $\angle 6$ **10.**  $m \angle 1 = 100$ , alternate interior angles;  $m \angle 2 = 100$ , corresponding angles or vertical angles **11.**  $m \angle 1 = 75$ , alternate interior angles;  $m \angle 2 = 75$ , vertical angles or corresponding angles **12.**  $m \angle 1 = 135$ , corresponding angles;  $m \angle 2 = 135$ , vertical angles **13.**  $x = 103;77^{\circ}$ , **14.**  $x = 24; 12^{\circ}, 168^{\circ}$ **15.**  $x = 30; 85^{\circ}, 85^{\circ}$ 103° **16a.** Alternate Interior Angles Theorem 16b. Vertical angles are congruent. **16c.** Transitive Property of Congruence

#### Practice 3-2

1c.  $\overrightarrow{TS}$ 1b.  $\overrightarrow{QR}$ **1a.** same-side interior **1d.** same-side interior **1e.** Same-Side Interior Angles 1f. TS**1g.** 3-5 2. *l* and *m*, Converse of Same-Side **4.**  $\overline{BC}$  and  $\overline{AD}$ , Interior Angles Theorem **3.** none Converse of Same-Side Interior Angles Theorem **5**. *RT* and  $\overline{HU}$ , Converse of Corresponding Angles Postulate **6.**  $\overline{BH}$  and  $\overline{CI}$ . Converse of Corresponding Angles Postulate 7. *a* and *b*, Converse of Same-Side Interior Angles Theorem 8. 43 9.90 **10.** 38 **11.** 100 **12.** 70 **13**. 48

#### Practice 3-3

**1.** 125 **2.** 69 **3.** 143 **4.** 129 **5.** 140 **6.** 136 **7.** x = 35; y = 145; z = 25**8.** a = 55; b = 97; c = 83**9.** v = 118; w = 37; t = 62**10.** 50 **11.** 88 **12.**  $m \angle 3 = 22; m \angle 4 = 22; m \angle 5 = 88$ **13.** 57.1 **15.**  $m \angle 1 = 33; m \angle 2 = 52$ **14.** 136 **16.** isosceles **17.** obtuse scalene **18.** right scalene 19. obtuse isosceles **20.** equiangular equilateral

#### Practice 3-4

**1.** x = 120; y = 60**2.**  $n = 51\frac{3}{7}$ **3.** a = 108; b = 72**4.** 109 **5.** 133 **6.** 129 **7.** 129 **8.** 47 9. 127 **10.** 30 **11.** 150 **12.** 6 **13.** 5 **14.** 8 **15.** *BEDC* **16.** ∠*FAE* **17.**  $\angle FAE$  and  $\angle BAE$ **18.** *ABCDE* 19. 20

### Practice 3-5

11.  $v = \frac{1}{2}x + 2_6$ 12. 246 X 6-4-246 6-4-2 13. 14. = 2x - 7 = 2x - 3 6 4 2 246 X 15. 16. + 5 246 x -6 17. 18. = 5x + 4 246 X 19. 20. = - 2 x 246 X 2, 246 X 22. 21. 246 X 246 23. 24. x = 2.5 v =46 x 4-2, **25.** y = -3x + 13**26.** y = x + 4**27.**  $y = \frac{1}{2}x - 3$ **28.**  $y = -\frac{1}{2}x - \frac{1}{2}$ **29.** y = 2x + 4**30.**  $v = \frac{1}{2}x + 4$ 

**31.**  $y = -\frac{1}{5}x - \frac{6}{5}$  **32.** y = -6x + 45 **33.** x = 2; y = -11 **34.** x = 0; y = 2 **35.** x = -4; y = -4**36.** x = -1; y = 837. 38. (-2, 0) (4, 0) (0, -12)39. 40. (0, 6) 0)2(0, 2) 246 x 4 (6, 0) 41. 42. 6 4 (0, 1) (8, 0) (4, 0)2468 43. 44. (0, 6) 12 (0, 12) (9, 0) 2468 246 x

**45a.** m = \$0.10 **45b.** the amount of money the worker is paid for each box loaded onto the truck **45c.** b = \$3.90**45d.** the base amount the worker is paid per hour **46.**  $y = -\frac{2}{5}x + 8$ 

### Practice 3-6

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**1.** neither;  $3 \neq \frac{1}{3}$ ,  $3 \cdot \frac{1}{3} \neq -1$  **2.** perpendicular;  $\frac{1}{2} \cdot -2 = -1$  **3.** parallel;  $-\frac{2}{3} = -\frac{2}{3}$  **4.** parallel; -1 = -1 **5.** perpendicular; y = 2 is a horizontal line, x = 0 is a vertical line **6.** parallel;  $-\frac{1}{2} = -\frac{1}{2}$  **7.** neither;  $1 \neq \frac{1}{8}$ ,  $1 \cdot \frac{1}{8} \neq -1$  **8.** parallel;  $-\frac{2}{3} = -\frac{2}{3}$  **9.** perpendicular;  $-1 \cdot 1 = -1$  **10.** neither;  $\frac{1}{2} \neq -\frac{5}{3}$ ,  $\frac{1}{2} \cdot -\frac{5}{3} \neq -1$  **11.** neither;  $-\frac{2}{3} \neq -\frac{7}{12}$ ,  $-\frac{2}{3} \cdot -\frac{7}{12} \neq -1$  **12.** neither;  $6 \neq -\frac{1}{5}$ ,  $6 \cdot -\frac{1}{5} \neq -1$  **13.** neither;  $\frac{9}{2} \neq 4$ ,  $\frac{9}{2} \cdot 4 \neq -1$  **14.** parallel;  $\frac{1}{2} = \frac{1}{2}$  **15.**  $y = \frac{2}{3}x$  **16.**  $y = -\frac{4}{3}x + 24$  **17.** y = -x - 3 **18.**  $y = \frac{3}{5}x + 6$  **19.** y = 0 **20.** y = 2x - 4**21.** y = 2x





**10.** Sample:



**11.** Sample:













1c.–1d. Sample:



**2.** 110 **3.** 70 **4.** 110 **5.** 110 **6.** 70 **7.** 70 **8.** 110

#### **Reteaching 3-2**



# Reteaching 3-3

**1.**  $\triangle ABD: m \angle ABD = 120, m \angle ADB = 30; \triangle CBE: m \angle CBE = 120, m \angle CEB = 30, m \angle BCE = 30; \triangle BDE: m \angle BDE = 60, m \angle DBE = 60, m \angle BED = 60$ **2.**  $\triangle DBE$  and  $\triangle ABC$  are acute, equiangular, and equilateral;  $\triangle ABD$  and  $\triangle CBE$  are isosceles and obtuse;  $\triangle ACE, \triangle ADE, \triangle CED$ , and  $\triangle CAD$  are right and scalene. **3.**  $\triangle PQT: m \angle PTQ = 45, m \angle PQT = 90; \triangle PQR: m \angle PQR = 90, m \angle QPR = 45, m \angle QRP = 45; \triangle RQS: m \angle RQS = 90, m \angle QSR = 45; \triangle SQT: m \angle SQT = 90, m \angle QST = 45, m \angle SQT = 90, m \angle QST = 45, m \angle SQT = 90, m \angle QST = 45, m \angle SQT = 28 \text{ mm}$ **5.**  $\triangle PQT, \triangle PQR, \triangle RQS, \triangle SQT, \triangle PRS, \triangle PTS, \triangle PRT, and \triangle RST$  are right and isosceles.

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Geometry Chapter 3

# **Reteaching 3-4**

**1.**  $\angle 1$  and  $\angle 2$  are interior angles;  $\angle 3$  and  $\angle 4$  are exterior angles. **2.**  $m \angle 1 = 135; m \angle 2 = 90; m \angle 3 = 45;$  $m \angle 4 = 90$  **3.**  $\angle 1$  is an interior angle;  $\angle 2$  and  $\angle 4$  are exterior angles;  $\angle 3$  is neither. **4.**  $m \angle 1 = 60; m \angle 2 = 120;$  $m \angle 3 = 60; m \angle 4 = 120$ 

# **Reteaching 3-5**

Check students' graphs. 1. y = 2x - 6 2.  $y = \frac{1}{3}x$  3. y = -x - 34.  $y = \frac{5}{6}x + 2$  5.  $y = -\frac{1}{2}x + 1$  6. y = 17.  $y = -\frac{7}{2}x + 10$  8. y = -x + 1 9.  $y = \frac{2}{5}x + 1$ 10. y = 1 11. y = -2x - 6 12. x = -313. y = -3x + 10 14. y = 3x - 1015.  $y = \frac{1}{4}x + \frac{1}{2}$  16.  $y = -\frac{3}{4}x + 4$ 17. y = -x + 1 18. y = 1

## **Reteaching 3-6**



# 6a. y = 3x + 7 6b. $y = -\frac{1}{3}x - 3$ 6c. 4y-4 -2 0 2 4 x -4 -2 0 2 4 x

**7.**  $m_{JK} = -1; m_{LM} = -1;$  parallel **8.**  $m_{JK} = \frac{2}{3}; m_{LM} = -\frac{3}{2};$  perpendicular **9.**  $m_{JK} = -\frac{1}{6}; m_{LM} = -\frac{1}{5};$  neither **10.**  $m_{JK} = -\frac{3}{2}; m_{LM} = \frac{4}{5};$  neither **11.**  $m_{JK} = 2; m_{LM} = -\frac{1}{2};$  perpendicular **12.**  $m_{JK} = \frac{1}{5}; m_{LM} = 5;$  neither **13.**  $m_{JK} = \frac{1}{4}; m_{LM} = -\frac{1}{4};$  parallel **14.**  $m_{JK}$  undefined;  $m_{LM} = 0;$  perpendicular

## **Reteaching 3-7**



**2.–4.** Check students' work.

# **Enrichment 3-1**

**1.**  $\overrightarrow{OE}$  is  $\perp$  to  $\overrightarrow{AB}$ . **2.** 3, 5, 1, 4, 2, 6 or 4, 5, 1, 3, 2, 6;  $\overrightarrow{OE}$  is  $\perp$  to  $\overrightarrow{AB}$ ; if two angles are congruent and supplementary, then each measures 90°. **3.**  $\angle 1 \cong \angle 2$ ; Law of Reflection **4.**  $\angle 2 \cong \angle 3$ ; Alternate Interior Angles Theorem **5.**  $\angle 3 \cong \angle 4$ ; Law of Reflection **6.**  $\angle 1 \cong \angle 4$ ; Transitive Property of Congruence

# **Enrichment 3-2**

**1.** x = 11 **2.** 106 **3.** 33 **4.** 41 **5.** Sample: Because  $m \angle BAC = 41, m \angle CAF = 180 - 41 = 139$ ;  $l \parallel m$  because a pair of alternate interior angles are congruent. **6.**  $\overline{CD}$  and  $\overline{EF}$ ;  $\overline{AK}$  **7.** Sample:  $\angle CAB$  and  $\angle IGH$  are corresponding angles related to parallel segments  $\overline{AB}$  and  $\overline{GH}$ .  $\overline{AK}$  is the related transversal. **8.** Sample:  $\angle A, \angle ADE$ , and  $\angle AED$  form a triangle, so 180 - (43 + 76) = 61, so

#### Answers

 $m \angle AED = 61$ . Because  $\angle AED$  and  $\angle C$  are congruent corresponding angles,  $\overline{DE} \parallel \overline{BC}$  by the Converse of the Corresponding Angles Postulate.

### **Enrichment 3-3**

**1.** 48 **2.** 2880 **3.** 4320 **4.** Angles have measures of  $20,70, \text{ or } 90; \overline{AC} \parallel \overline{MD} \parallel \overline{LE} \parallel \overline{KF} \parallel \overline{JG}; \overline{BM} \parallel \overline{CH} \parallel \overline{NK};$  $\overline{AH} \parallel \overline{PG}; \overline{CM} \parallel \overline{DL} \parallel \overline{EK} \parallel \overline{JF} \parallel \overline{JG}.$ 

### **Enrichment 3-4**

Ι.	2 <b>2.</b> 5	3	. 9	4	<b>1.</b> 14	4	5.	20	6	. 27
7.	Number of sides	3	4	5	6	7	8	9		n
	Total degree measure	180	360	540	720	900	1080	1260		(n – 2)180
	Number of diagonals	0	2	5	9	14	20	27		$\frac{n(n-3)}{2}$

### **Enrichment 3-5**



#### RENE DESCARTES

#### **Enrichment 3-6**



### **Enrichment 3-7**





2. scalene, acute triangle
5. No; refer to the answer to Exercises 1, 3, and 4.
6. \



7. isosceles, obtuse triangle

# **Chapter Project**

**Activity 1: Paper Folding** 

5; all triangles are right isosceles; yes.

**Activity 2: Exploring** 



#### quadrilaterals











#### **Activity 3: Analyzing**



#### Activity 4: Modeling



# Checkpoint Quiz 1

1. Converse of Corresponding Angles Postulate **2.** Alternate Interior Angle Theorem 3. Same-Side Interior Angles Theorem 4. Corresponding Angles Postulate **5.** Converse of Alternate Interior Angle **6.** Vertical Angles Theorem 7. Converse Theorem of Corresponding Angles Postulate **8.** Corresponding 9. Converse of Same-Side Interior Angles Postulate Angles Theorem **10.** x = 50, y = 30, z = 65

### ✔ Checkpoint Quiz 2



7. Parallel; slopes are the same.
8. neither
9. Perpendicular; the product of the slopes is -1.
10. neither

#### Chapter Test, Form A

1. true **2.** true **3.** false 4. false 5. true **7.** true **6.** false **8.** true 9. Answers may vary. Sample:  $m \angle 1 = 125$ , Same-Side Interior Angles Theorem;  $m \angle 2$ = 55, Alternate Interior Angles Theorem **10.** Answers may vary. Sample:  $m \angle 1 = 60$ , Corresponding Angles Postulate then Angle Addition Postulate;  $m \angle 2 = 60$ , Same-Side Interior Angles Theorem **11.** Answers may vary. Sample:  $m \angle 1 = 85$ , Alternate Interior Angles Theorem;  $m \angle 2 = 95$ , Same-Side Interior Angles Theorem **12.** Answers may vary. Sample:  $m \angle 1 = 75$ , Corresponding Angles Postulate;  $m \angle 2 = 105$ , Angle Addition Postulate **13.** Answers may vary. Sample:  $m \angle 1 = 91$ , Corresponding Angles Postulate and Same-Side Interior Angles Theorem;  $m \angle 2 = 89$ , Corresponding Angles **14.** Answers may vary. Sample:  $m \angle 1 = 60$ , Postulate Alternate Interior Angles Theorem;  $m \angle 2 = 115$ , Same-Side Interior Angles Theorem



**17.**  $\overline{WA}$  and  $\overline{XB}$ **18.** none **19.**  $\overline{WZ}$  and  $\overline{AB}$ **22.**  $\overline{WZ}$  and  $\overline{AB}$ :  $\overline{AX}$ **20.** none **21.**  $\overline{WZ}$  and  $\overline{AB}$ and  $\overline{BY}$ **23.** x = 22; y = 120**24.** x = 70; y = 60;**25.** x = 35; y = 35; z = 55z = 120**26.** 5940 **27.** 18 **28.** perpendicular **29.** neither **30.** parallel **31.** y = 6x + 23**32.**  $y = -\frac{1}{2}x + 3$ **33.**  $y = \frac{1}{3}x + 2$ 

#### Chapter Test, Form B

**1.** false **2.** false **3.** false **4.** true 5. false 6. false 7. false **8.** true 9. Answers may vary. Sample:  $m \angle 1 = 120$ , Corresponding Angles Postulate;  $m \angle 2 = 120$ , Alternate Interior Angles Theorem **10.** Answers may vary. Sample:  $m \angle 1 = 90$ , Same-Side Interior Angles Theorem;  $m \angle 2 = 90$ , Vertical Angles Theorem **11.** Answers may vary. Sample:  $m \angle 1 = 75$ , Alternate Interior Angles Theorem;  $m \angle 2 = 80$ , Same-Side Interior Angles Theorem **12.** Answers may vary. Sample:  $m \angle 1 = 80$ , Corresponding Angles Postulate;  $m \angle 2 = 100$ , Same-Side Interior Angles Theorem **13.** Answers may vary. Sample:  $m \angle 1 = 88$ , Corresponding Angles Postulate;  $m \angle 2 = 92$ , Same-Side Interior Angles Theorem **14.** Answers may vary. Sample:  $m \angle 1 = 150$ , Corresponding Angles Postulate and Angle Addition Postulate;  $m \angle 2 = 91$ , Corresponding Angle Postulate and Vertical Angles Theorem 15.



**17.** *AB* and *ED* **18.** *AE* and *BD* **19.** *EB* and *DC* **20.** none **21.** none **22.** *AE* and *BD*; *EB* and *DC* **23.** x = 70; y = 70; z = 110 **24.** x = 33; y = 33; z = 114 **25.** x = 90; y = 25; z = 50 **26.** 4500 **27.** 15 **28.** parallel **29.** neither **30.** perpendicular **31.** y = 4x + 17 **32.**  $y = -\frac{1}{3}x - 4$  **33.**  $y = -\frac{2}{3}x$ 

#### Alternative Assessment, Form C

TASK 1: Scoring Guide a.

$$\begin{array}{c} 1/2 \\ 4/3 \\ 5/8 \\ 6/7 \end{array} b$$

**b.** Sample:  $\angle 8 \cong \angle 2$ ;  $\angle 8 \cong \angle 4$ ;  $\angle 8$  and  $\angle 3$  are supplementary. **c.**  $m \angle 2 = 75$ ;  $m \angle 3 = 105$ ,  $m \angle 4 = 75$ ,  $m \angle 5 = 105$ ,  $m \angle 6 = 75$ ,  $m \angle 7 = 105$ ,  $m \angle 8 = 75$ 



**3** Student draws an accurate diagram and supplies correct answers and a complete and accurate flow proof.

**2** Student draws a figure or gives answers that contain minor errors.

**1** Student draws a figure or gives answers that contain significant errors or omissions.

**0** Student makes little or no attempt.

#### **TASK 2: Scoring Guide**

Sample:



**3** Student constructs an accurate figure.

**2** Student constructs a figure that contains minor errors or omissions.

**1** Student constructs a figure that contains significant errors or omissions.

**0** Student makes little or no attempt.

# TASK 3: Scoring Guide



**a.** For the figure given, y = x and y = x + 3. The lines are parallel because both lines have a slope of 1.

**c.** For  $\triangle ABC$ , the sum of the three angles is  $\approx 180^{\circ}$ . Minor discrepancies are the result of measurement error and rounding error.

**d.** For the figure given, *ABDC* is not regular. By the distance formula, the sides are not congruent.

**3** Student draws the figure accurately, writes correct equations, and reasons logically.

**2** Student draws a figure, gives arguments, and writes equations that are mainly correct but may contain minor errors.

- 1 Student presents work with significant errors.
- **0** Student makes little or no attempt.

#### **TASK 4: Scoring Guide**





**3** Student draws an accurate diagram.

**2** Student draws a diagram that contains minor errors or omissions.

**1** Student draws a diagram that contains significant errors or omissions.

**0** Student makes little or no attempt.

#### **Cumulative Review**

1. D 7. A	2. B 8. A	3. C 9. C	4. A 10. D	5. D 11. D	6. D 12. D
<b>13.</b> B	<b>14.</b> B	15. (	C <b>16.</b>	В <b>17</b> .	С
<b>18.</b> Giv	ven <b>19</b>	. Same-S	Side Inter	ior Angles	Theorem
<b>20.</b> Co	rrespondi	ng Angles	s Postulate	e 21. (	Corresponding
Angles	Postulate	<b>22.</b> s	substitutio	n <b>23.</b>	Check students'
work.	<b>24.</b> Sk	etches ma	ay vary. Th	ie right an	gle must be
between	1 the equa	l sides.	<b>25.</b> No	; a triangle	e cannot have
two side	es equal a	nd no sid	es equal a	t the same	time.

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