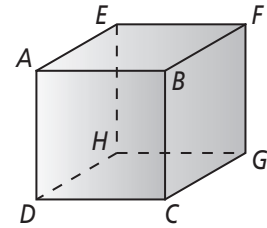


Extra Practice

Chapter 3

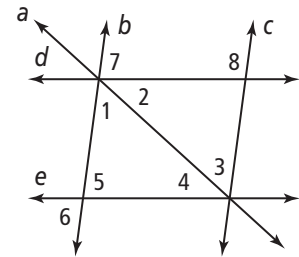
Lesson 3-1

Use the cube to name each of the following.



- all lines that are parallel to \overleftrightarrow{BC} **$\overleftrightarrow{AD}, \overleftrightarrow{EH}, \overleftrightarrow{FG}$**
- a pair of parallel planes **sample answers: plane ABC and plane EFG , or plane AEH and plane BCG**
- two lines that are skew to \overleftrightarrow{AE} **sample answer: $\overleftrightarrow{BC}, \overleftrightarrow{HG}$**

Identify all pairs of each type of angles in the diagram.
Name the two lines and the transversal that form each pair.



- corresponding angles **$\angle 5$ and $\angle 7$; d, e , and b**
- alternate interior angles **$\angle 1$ and $\angle 3$; b, c , and a , $\angle 2$ and $\angle 4$; d, e , and a**
- same-side interior angles **$\angle 7$ and $\angle 8$; b, c , and d**
- alternate exterior angles **$\angle 6$ and $\angle 7$; d, e , and b**

Lesson 3-2

Find $m\angle 1$ and $m\angle 2$. State the theorems or postulates that justify your answers.

- $m\angle 1 = 134$; Same-Side Int. \angle Thm.
 $m\angle 2 = 46$; Alt. Int. \angle Thm.**
- $m\angle 1 = 125$; Corr. \angle Post.
 $m\angle 2 = 55$; Same-Side Int. \angle Thm.**
- $m\angle 1 = 58$; Alt. Int. \angle Thm.
 $m\angle 2 = 122$; Same-Side Int. \angle Thm.**
- $m\angle 1 = 64$; Alt. Int. \angle Thm.
 $m\angle 2 = 116$; Same-Side Int. \angle Thm.**
- $m\angle 1 = 103$; Corr. \angle Post.
 $m\angle 2 = 103$; Alt. Ext. \angle Thm.**
- $m\angle 1 = 82$; Same-Side Int. \angle Thm.
 $m\angle 2 = 82$; Alt. Ext. \angle Thm.**

Find the value of each variable. Then find the measure of each labeled angle.

- $x = 45, x + 15 = 2x - 30 = 60$**
- $x = 62, (3x - 44) = 142, (x - 24) = 38$**
- $x = 17, y = 35$;
 $5x = (3x + 34) = 85$,
 $2y = (3y - 35) = 70$**

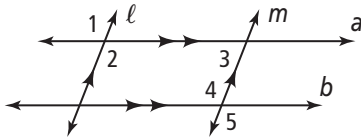
Extra Practice (continued)

Chapter 3

17. Complete the proof.

Given: $\ell \parallel m, a \parallel b$

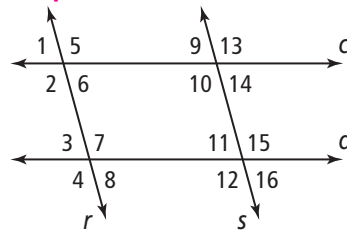
Prove: $\angle 1 \cong \angle 5$



Statements	Reasons
1. $\ell \parallel m, a \parallel b$	1. Given
2. $\angle 1 \cong \angle 2$	a. <u>?</u> Vert. \triangle Thm.
3. $\angle 2$ and $\angle 3$ are supplementary.	b. <u>?</u> Same-Side Int. \triangle Thm.
4. $\angle 3$ and $\angle 4$ are supplementary.	c. <u>?</u> Same-Side Int. \triangle Thm.
5. $\angle 2 \cong \angle 4$	d. <u>?</u> \cong Supplements Thm.
6. $\angle 1 \cong \angle 4$	e. <u>?</u> Trans. Prop. Of \cong
7. $\angle 4 \cong \angle 5$	f. <u>?</u> Vert. \triangle Thm.
8. $\angle 1 \cong \angle 5$	g. <u>?</u> Trans. Prop. Of \cong

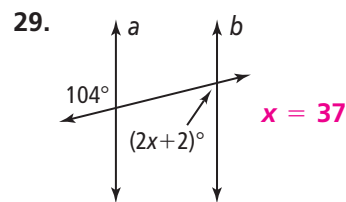
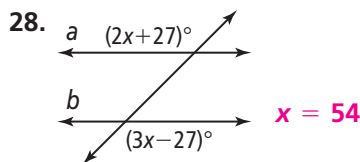
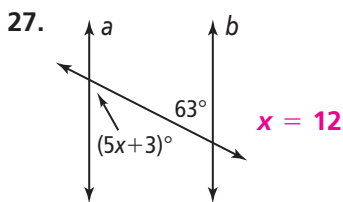
Lesson 3-3

Refer to the diagram at the right. Use the given information to determine which lines, if any, must be parallel. If any lines are parallel, use a theorem or postulate to tell why.



18. $\angle 9 \cong \angle 14$ **none** 19. $\angle 1 \cong \angle 9$ **$r \parallel s$, Conv. of Corr. \triangle Post.**
20. $\angle 2$ is supplementary to $\angle 3$.
 $c \parallel d$, Conv. of Same-Side Int. \triangle Thm.
22. $m\angle 6 = 60, m\angle 13 = 120$
 $r \parallel s$, Vert. \triangle Thm. and Conv. of Same-Side Int. \triangle Thm.
24. $\angle 3$ is supplementary to $\angle 10$. **none** 23. $\angle 4 \cong \angle 13$ **none**
25. $\angle 10 \cong \angle 15$ **$c \parallel d$, Conv. of Alt. Int. \triangle Thm.**
26. $\angle 1 \cong \angle 8$ **$c \parallel d$, Conv. of Alt. Ext. \triangle Thm.**

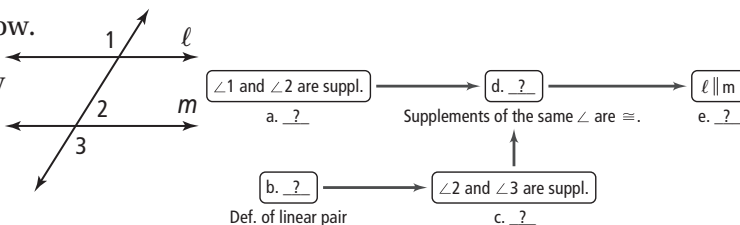
Find the value of x for which $a \parallel b$.



30. Complete the flow proof below.

Given: $\angle 1$ is supplementary to $\angle 2$

Prove: $\ell \parallel m$



- a. Given; b. $\angle 2$ and $\angle 3$ form a linear pair; c. Def. of supplementary \triangle ; d. $\angle 1 \cong \angle 3$
e. Conv. of Alt. Ext. \triangle Thm.

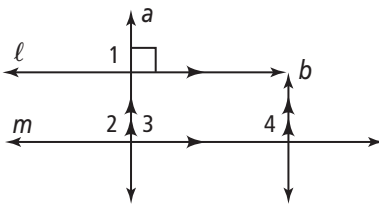
Extra Practice (continued)

Chapter 3

Lesson 3-4

31. Given: $\ell \parallel m, a \parallel b, a \perp \ell$

Prove: $b \perp m$

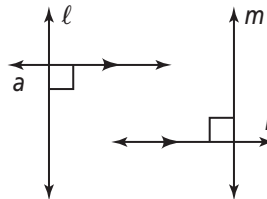


$a \perp \ell$ and $a \parallel b$ means that $\ell \perp b$ since a line \perp to one of two \parallel lines is \perp to the other (Thm. 3-9). $\ell \perp b$ and $\ell \parallel m$ means that $b \perp m$ for the same reason.

32 Write a paragraph proof.

Given: $a \parallel b, a \perp \ell, b \perp m$

Prove: $\ell \parallel m$

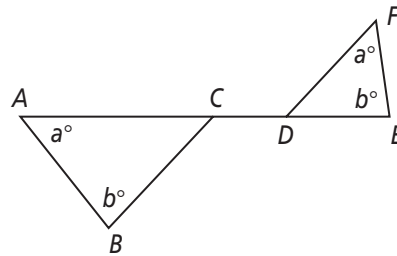


$a \perp \ell$ and $a \parallel b$ means that $\ell \perp b$ since a line \perp to one of two \parallel lines is \perp to the other (Thm. 3-9). $\ell \perp b$ and $b \perp m$ means that $\ell \parallel m$ since two lines \perp to the same line are \parallel to each other (Thm. 3-8).

Lesson 3-5

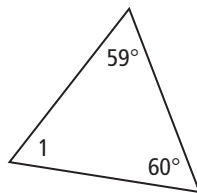
33. Use the figure at the right. What is the relationship between \overleftrightarrow{BC} and \overleftrightarrow{DF} ? Justify your answer.

$\overleftrightarrow{BC} \parallel \overleftrightarrow{DF}$; by the Ext. \angle Thm., $m\angle BCD = a + b$ and $m\angle CDF = a + b$. Thus, $m\angle BCD = m\angle CDF$ by the Trans. Prop. Of =. $\overleftrightarrow{BC} \parallel \overleftrightarrow{DF}$ by the Converse of the Alt. Int. \triangle Thm.



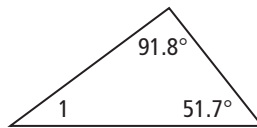
Find $m\angle 1$.

34.



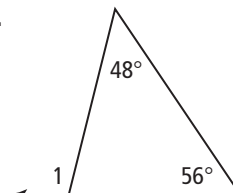
$m\angle 1 = 61$

35.



$m\angle 1 = 36.5$

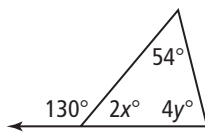
36.



$m\angle 1 = 104$

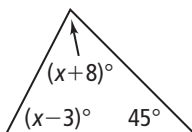
Find the value of each variable.

37.



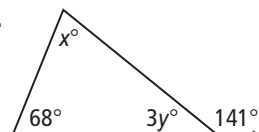
$x = 25; y = 19$

38.



$x = 65$

39.



$x = 73; y = 13$

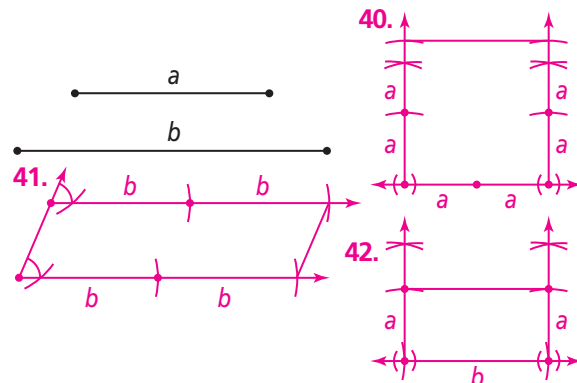
Lesson 3-6

Use the segments for each construction.

40. Construct a square with side length $2a$.

41. Construct a quadrilateral with one pair of parallel sides each of length $2b$.

42. Construct a rectangle with sides b and a .



Extra Practice (continued)

Chapter 3

Lesson 3-7

Use the given information to write an equation of each line.

43. slope -4 , y -intercept 6 $y = -4x + 6$ 44. slope 7 , passes through $(1, -2)$
 $y + 2 = 7(x - 1)$ or $y = 7x - 9$

Write an equation in point-slope form of the line that contains the given points.

45. $A(4, 2), B(6, -3)$ 46. $C(-1, -1), D(1, 1)$ 47. $F(3, -5), G(-5, 3)$
 $y - 2 = -\frac{5}{2}(x - 4)$ or $y + 1 = (x + 1)$ or $y + 5 = -1(x - 3)$ or
 $y + 3 = -\frac{5}{2}(x - 6)$ $y - 1 = (x - 1)$ $y - 3 = -1(x + 5)$

Write an equation in slope-intercept form of the line through the given points.

48. $M(-2, 4), N(5, -8)$ 49. $P(0, 2), Q(6, 8)$ 50. $K(5, 0), L(-5, 2)$
 $y = -\frac{12}{7}x + \frac{4}{7}$ $y = x + 2$ $y = -\frac{1}{5}x + 1$

Lesson 3-8

Without graphing, tell whether the lines are parallel, perpendicular, or neither. Explain.

51. $y = 4x - 8$ 52. $13y - x = 7$ 53. $y = -\frac{4}{3}x + 2$
 $y = 4x - 2$ $7 - \frac{y}{2} = x$ $\frac{4}{3}y = x - 1$
||; same slope **neither; not same slope and $m_1 \cdot m_2 \neq -1$** **⊥; $m_1 \cdot m_2 = -1$**
54. $2x + 3y = 5$ 55. $y = -2x + 7$ 56. $5x - 3y = 0$
 $5x - 10y = 30$ $x - 2y = 8$ $y = \frac{5}{3}x + 2$
neither **perpendicular** **parallel**

Write an equation for the line parallel to the given line through the given point.

57. $y = x - 7, (0, 4)$ 58. $y = \frac{1}{2}x + 3, (6, 3)$ 59. $y = -\frac{1}{5}x, (5, -8)$
 $y - 4 = x$ or $y = x + 4$ $y - 3 = \frac{1}{2}(x - 6)$ or $y = \frac{1}{2}x$ $y + 8 = -\frac{1}{5}(x - 5)$ or
 $y = -\frac{1}{5}x - 7$

Write an equation for the line perpendicular to the given line through the given point.

60. $y = x + 2, (3, 2)$ 61. $y = -2x, (4, 0)$ 62. $y = \frac{1}{3}x - \frac{2}{5}, (5, -1)$
 $y - 2 = -1(x - 3)$ $y = \frac{1}{2}(x - 4)$ or $y + 1 = -3(x - 5)$ or
or $y = -x + 5$ $y = \frac{1}{2}x - 2$ $y = -3x + 14$

63. On a city map, Washington Street is straight and passes through points at $(7, 13)$ and $(1, 5)$. Wellington Street is straight and passes through points at $(3, 24)$ and $(9, 32)$. Do Washington Street and Wellington Street intersect? How do you know? **No; the slopes of the lines are equal and the y -intercepts are different.**