12. 44°, 136°; $m\angle 2 = 136°$ because if two parallel lines are cut by a transversal, then the alternate exterior angles are congruent; $m\angle 1 = 44°$ because it is a linear pair with $\angle 2$.

13. 68°, 112°; $m\angle 1 = 68°$ because if two parallel lines are cut by a transversal, then the alternate interior angles are congruent; $m\angle 2 = 112°$ because it is a linear pair with $\angle 1$.

14. 106°, 106°; $m\angle 1 = 106°$ because if two parallel lines are cut by a transversal, then the corresponding angles are congruent; $m\angle 2 = 106°$ because $\angle 1$ and $\angle 2$ are vertical angles.

19. Yes; if two lines are cut by a transversal so that a pair of consecutive interior angles are supplementary, then the lines are parallel.

20. Yes; if two lines are cut by a transversal so that a pair of consecutive interior angles are supplementary, then the lines are parallel.

21. Yes; if two lines are cut by a transversal so that alternate interior angles are congruent, then the lines are parallel.

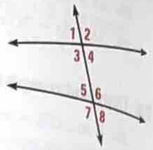
22. Yes; if two lines are cut by a transversal so that a pair of consecutive interior angles are supplementary, then the lines are parallel. Or if two lines are cut by a transversal so that the alternate interior angles are congruent, then the lines are parallel.

23. Yes; if two lines are cut by a transversal so that a pair of ~~consecutive interior angles are supplementary, then the lines are parallel.~~ Alt. interior are ≅

EXTRA PRACTICE

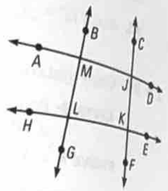
Chapter 3

3.1 Classify the angle pair as *corresponding*, *alternate interior*, *alternate exterior*, or *consecutive interior* angles.



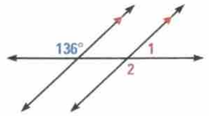
1. $\angle 6$ and $\angle 2$ corresponding
2. $\angle 7$ and $\angle 2$ alternate exterior
3. $\angle 5$ and $\angle 3$ consecutive interior
4. $\angle 4$ and $\angle 5$ alternate interior
5. $\angle 1$ and $\angle 5$ corresponding
6. $\angle 3$ and $\angle 6$ alternate interior

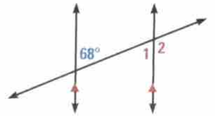
3.1 Copy and complete the statement. List all possible correct answers.

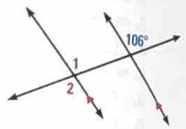


7. $\angle AMB$ and ? are corresponding angles. $\angle HLM$ and $\angle MJC$
8. $\angle AML$ and ? are alternate interior angles. $\angle MLK$
9. $\angle CJD$ and ? are alternate exterior angles. $\angle FKL$ and $\angle AML$
10. $\angle LMJ$ and ? are consecutive interior angles. $\angle MLK$ and $\angle MJK$
11. ? is a transversal of $\overleftrightarrow{AD}$ and $\overleftrightarrow{HE}$. $\overleftrightarrow{BG}$ and $\overleftrightarrow{CF}$

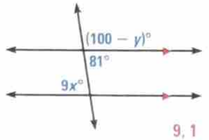
3.2 Find $m\angle 1$ and $m\angle 2$. *Explain* your reasoning. 12–14. See margin.

12.


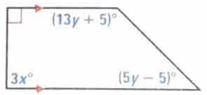
13.


14.


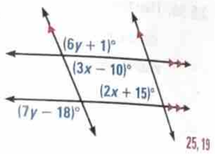
3.2 Find the values of x and y.

15.


9, 1

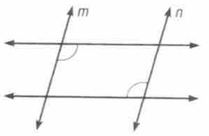
16.


30, 10

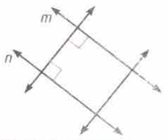
17.


25, 19

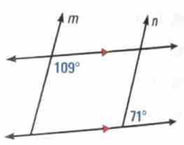
3.3 Is there enough information to prove $m \parallel n$? If so, state the postulate or theorem you would use.

18.


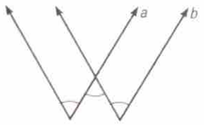
no

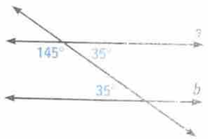
19.


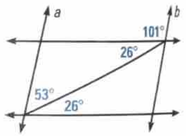
19, 20. See margin.

20.


3.3 Can you prove that lines a and b are parallel? If so, *explain* how. 21–23. See margin.

21.


22.


23.


3.4 Tell whether the lines through the given points are *parallel*, *perpendicular*, or *neither*. *Justify* your answer.

24. Line 1: (7, 4), (10, 5) Line 2: (2, 3), (8, 5) Parallel; the slopes are equal.
25. Line 1: (−3, 1), (−2, 5) Line 2: (−1, −3), (5, −2) 25, 26. See margin.
26. Line 1: (−6, 0), (8, 7) Line 2: (1, 4), (2, 2)

3.4 Tell which line through the given points is steeper.

27. Line 1: (0, −6), (−4, −9) Line 2: (−2, 5), (1, 9) Line 2
28. Line 1: (−1, −5), (−1, 3) Line 2: (−3, 4), (−5, 4) Line 1
29. Line 1: (1, 1), (2, 6) Line 2: (1, 1), (3, 10) Line 1

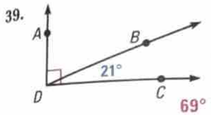
3.5 Write an equation of the line that passes through the given point P and has the given slope m.

30. $P(4, 7)$, $m = 2$ $y = 2x - 1$
31. $P(-3, 0)$, $m = \frac{2}{3}$ $y = \frac{2}{3}x + 2$
32. $P(9, 4)$, $m = -\frac{1}{3}$ $y = -\frac{1}{3}x + 7$

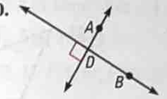
3.5 Write an equation of the line that passes through point P and is parallel to the line with the given equation.

33. $P(1, -2)$, $y = -2x - 6$ $y = -2x$
34. $P(6, 3)$, $y = -\frac{1}{3}x + 12$ $y = -\frac{1}{3}x + 5$
35. $P(-7, 3)$, $y = x + 3$ $y = x + 10$
36. $P(0, 3)$, $y = 4x - 2$ $y = 4x + 3$
37. $P(-9, 4)$, $y = \frac{2}{5}x + 1$ $y = \frac{2}{5}x + \frac{38}{5}$
38. $P(8, -3)$, $y = x - 5$ $y = x - 11$

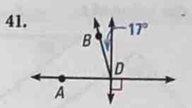
3.6 Find $m\angle ADB$.

39.


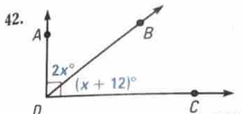
69°

40.


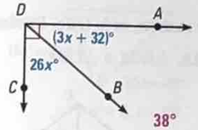
90°

41.


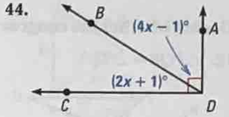
73°

42.


52°

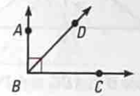
43.


38°

44.


59°

3.6 45. Copy and complete the proof.



GIVEN ▶ $\overrightarrow{BA} \perp \overrightarrow{BC}$, $\overrightarrow{BD}$ bisects $\angle ABC$.

PROVE ▶ $m\angle ABD = 45°$

STATEMENTS	REASONS
1. $\overrightarrow{BA} \perp \overrightarrow{BC}$	1. ? Given
2. ? $\angle ABC$ is a right angle.	2. Definition of perpendicular lines
3. $m\angle ABC = 90°$	3. ? Definition of right angle
4. ? $\overrightarrow{BD}$ bisects $\angle ABC$.	4. Given
5. $m\angle ABD = m\angle DBC$	5. ? Definition of angle bisector
6. $m\angle ABC = $? $+$? $m\angle ABD$, $m\angle DBC$	6. Angle Addition Postulate
7. $m\angle ABD + m\angle DBC = 90°$	7. ? Transitive Property of Equality
8. $m\angle ABD +$? $= 90°$ $m\angle ABD$	8. Substitution Property of Equality
9. $2(m\angle ABD) = 90°$	9. ? Simplify.
10. $m\angle ABD = 45°$	10. ? Division Property of Equality

EXTRA PRACTICE

25. Neither; the slopes are not equal and they are not opposite reciprocals.

26. Perpendicular; the slopes are opposite reciprocals.