NAME _____ DATE _____ PERIOD _____

2-1 Practice

Inductive Reasoning and Conjecture

Make a conjecture about the next item in each sequence.

1. 

2. 5, −10, 15, −20

3. $-2, 1, -\frac{1}{2}, \frac{1}{4}, -\frac{1}{8}$

4. 12, 6, 3, 1.5, 0.75

Determine whether each conjecture is *true* or *false*. Give a counterexample for any false conjecture.

9. If S, T, and U are collinear and $ST = TU$, then T is the midpoint of $\overline{SU}$.

10. If $\angle 1$ and $\angle 2$ are adjacent angles, then $\angle 1$ and $\angle 2$ form a linear pair.

11. If $\overline{GH}$ and $\overline{JK}$ form a right angle and intersect at P, then $\overline{GH} \perp \overline{JK}$.

12. **ALLERGIES** Each spring, Rachel starts sneezing when the pear trees on her street blossom. She reasons that she is allergic to pear trees. Find a counterexample to Rachel's conjecture.

LESSON 2.1

NAME _____ DATE _____

Practice A

For use with pages 71–78

Identify the hypothesis and the conclusion.

1. If the weather is warm, then we should go swimming.
2. If you want good service, then take your car to Joe's Service Center.
3. If you like purple, you'll love this sweater.
4. $2x - 12 = 40$ only if $x = 26$.
5. If the groundhog sees its shadow, then there will be six more weeks of winter.

Rewrite the conditional statement in if-then form.

6. Today is Monday if yesterday was Sunday.
7. An object measures 12 inches if it is one foot long.
8. A number is divisible by 4 if it is divisible by 8.
9. An acute angle is an angle that measures less than 90°.
10. All students taking geometry are in tenth grade.

Decide whether the statement is *true* or *false*. If false, provide a counterexample.

11. The equation $2x - 7 = 5 + x$ has exactly one solution.
12. If $x^2 = 16$, then x must equal 8 or -8.
13. February 14 is Valentine's Day.
14. If you visited the Statue of Liberty, then you've been to New York.
15. A point may lie on at most two lines.

Write the converse of each statement.

16. If you like tennis, then you play on the tennis team.
17. If x is odd, then $2x$ is even.
18. If $m\angle P = 45°$, then $\angle P$ is acute.

NAME _____ DATE _____

Practice A

For use with pages 79–85

Rewrite the biconditional statement as a conditional statement and its converse.

8. Two segments are congruent if and only if they have the same measure.
9. Three points are collinear if and only if they lie on the same line.
10. Four points are coplanar if and only if they lie in the same plane.
11. You may go to the movies Friday night if and only if you clean your room.
12. You may become president of the United States if and only if you are 35 years old.

Give a counterexample that demonstrates that the converse of the statement is false.

13. If you live in Detroit, then you live in Michigan.
14. If an angle measures 30°, then it is acute.
15. If an animal is a leopard, then it has spots.
16. If the month is September, then there are 30 days in the month.
17. If two angles are vertical angles, then they are not adjacent.

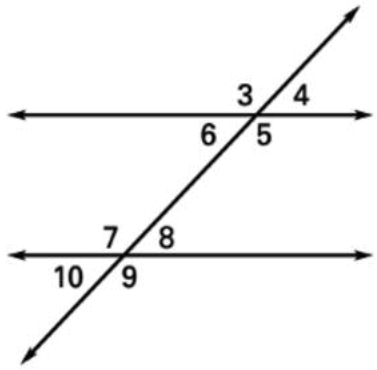
LESSON 3.1

NAME _____ DATE _____

Practice A

For use with pages 129–134

Complete the statement with *corresponding, alternate interior, alternate exterior,* or *consecutive interior.*



9. $\angle 3$ and $\angle 7$ are ___?___ angles.

10. $\angle 4$ and $\angle 10$ are ___?___ angles.

11. $\angle 5$ and $\angle 8$ are ___?___ angles.

12. $\angle 8$ and $\angle 6$ are ___?___ angles.

13. $\angle 9$ and $\angle 5$ are ___?___ angles.

14. $\angle 5$ and $\angle 7$ are ___?___ angles.

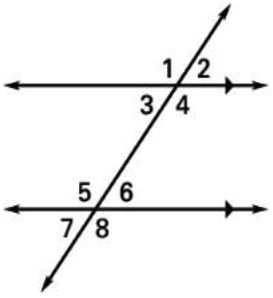
LESSON 3.3

NAME _____ DATE _____

Practice A

For use with pages 143–149

State the postulate or theorem that justifies the statement.



7. $\angle 3 \cong \angle 7$

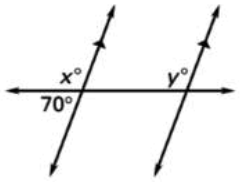
8. $\angle 3 \cong \angle 6$

9. $\angle 2 \cong \angle 7$

10. $m\angle 4 + m\angle 6 = 180^\circ$

Find the values of x and y.

11.



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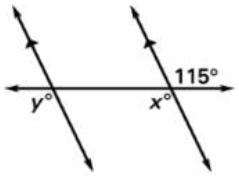

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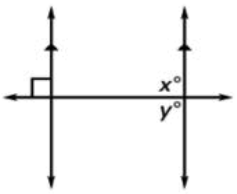

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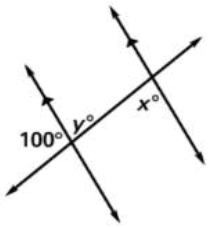

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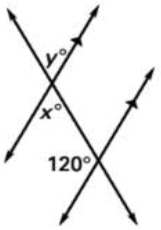

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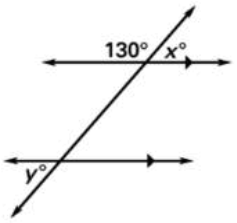
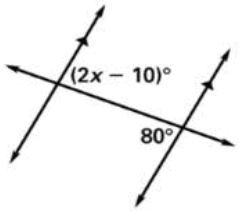


Find the value of x.

17.



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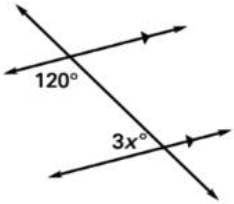

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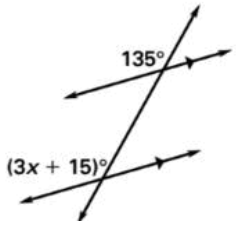
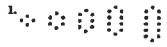


NAME _____ DATE _____ PERIOD _____

Practice

Inductive Reasoning and Conjecture

Make a conjecture about the next item in each sequence.

1. 

2. 5, −10, 15, −20 **25**

3. $-2, 1, -\frac{1}{2}, \frac{1}{4}, -\frac{1}{8}$ $\frac{1}{16}$

4. 12, 6, 3, 1.5, 0.75 **0.375**

Make a conjecture about each value or geometric relationship. 5–8. Sample answers are given.

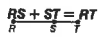
5. $\angle ABC$ is a right angle.

   $\overrightarrow{BA} \perp \overrightarrow{BC}$

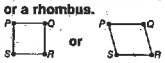
6. Point S is between R and T.

   $RS + ST = RT$

7. P, Q, R, and S are noncollinear and $\overline{PQ} \cong \overline{QR} \cong \overline{RS} \cong \overline{SP}$.

   The segments form a square or a rhombus.

8. $ABCD$ is a parallelogram.

   $AB = CD$ and $BC = AD$.

Determine whether each conjecture is *true* or *false*. Give a counterexample for any false conjecture.

9. If S, T, and U are collinear and $ST = TU$, then T is the midpoint of $\overline{SU}$. **true**

10. If $\angle 1$ and $\angle 2$ are adjacent angles, then $\angle 1$ and $\angle 2$ form a linear pair.

    False; $\angle 1$ and $\angle 2$ could each measure 60°.

11. If $\overline{GH}$ and $\overline{JK}$ form a right angle and intersect at P, then $\overline{GH} \perp \overline{JK}$. **true**

12. **ALLERGIES** Each spring, Rachel starts sneezing when the pear trees on her street blossom. She reasons that she is allergic to pear trees. Find a counterexample to Rachel's conjecture.

    Sample answer: Rachel could be allergic to other types of plants that blossom when the pear trees blossom.

2.1

Practice A

1. The weather is warm; we should go swimming.

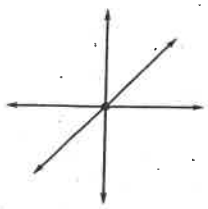
2. You want good service; take your car to Joe's Service Center. **3.** You like purple; you'll love this sweater. **4.** $2x - 12 = 40$; $x = 26$

5. The groundhog sees its shadow; there will be six more weeks of winter. **6.** If yesterday was Sunday, then today is Monday. **7.** If an object measures one foot, then it is 12 inches long.

8. If a number is divisible by 8, then it is divisible by 4. **9.** If an angle is acute, then it measures less than 90°.

10. If a student is taking geometry, then the student is in the tenth grade. **11.** true **12.** false; $x = \pm 4$ **13.** true **14.** true

15. false;



16. If you play on the tennis team, then you like tennis; If you don't play on the tennis team, then you don't like tennis. **17.** If $2x$ is even, then x is odd; If $2x$ is not even, then x is not odd. **18.** If $\angle P$ is acute, then $m\angle P = 45°$; If $\angle P$ is not acute, then $m\angle P \neq 45°$. **19.** Through any three noncollinear points there exists exactly one plane. **20.** Through any two points there exists exactly one line. **21.** If two planes intersect, then their intersection is a line. **22.** If two points lie in a plane, then the line containing them lies in the plane.

2.2

Practice A

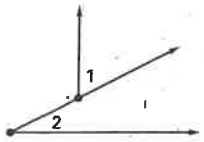
1. false **2.** true **3.** true **4.** false **5.** true

6. false **7.** true **8.** If two segments are congruent, then they have the same measure; If two segments have the same measure, then they are congruent. **9.** If three points are collinear, then they lie on the same line; If three points lie on the same line, then they are collinear. **10.** If four points are coplanar, then they lie in the same plane; If four points lie in the same plane, then they are coplanar. **11.** If you want to go to the movies Friday night, then you have to clean your room; If you clean your room, then you may go to the movies Friday night. **12.** If you are allowed to become president of the United States, then you must be 35 years old; If you are 35 years old, then you may become president of the United States. **13.** Lansing, MI **14.** 20°

2.2 Continued

15. Dalmatian **16.** June

17.



18. A saxophone that has a frequency of 104 cycles per second to 622 cycles per second is called a B-flat tenor saxophone.

19. A saxophone that has a frequency of 138 cycles per second to 831 cycles per second is called a E-flat alto saxophone.

3.1 Practice A

9. corresponding **10.** alternate exterior

11. consecutive interior **12.** alternate interior

13. corresponding **14.** alternate interior

3.3 Practice A

7. Corresponding Angles Postulate **8.** Alternate Interior Angles Theorem **9.** Alternate Exterior Angles Theorem

10. Consecutive Interior Angles Theorem

11. $x = 110, y = 110$ **12.** $x = 115, y = 115$

13. $x = 90, y = 90$ **14.** $x = 80, y = 80$

15. $x = 60, y = 60$ **16.** $x = 50, y = 50$

17. $x = 45$ **18.** $x = 20$ **19.** $x = 40$