GEO 13 #3/4 Sketch

LESSON 2.4

NAME _____ DATE _____

Reteaching with Practice

For use with pages 96–101

GOAL **Use properties from algebra and use properties of length and measure to justify segment and angle relationships**

VOCABULARY

Algebraic Properties of Equality
Let a, b, and c be real numbers.

Addition Property If $a = b$, then $a + c = b + c$.

Subtraction Property If $a = b$, then $a - c = b - c$.

Multiplication Property If $a = b$, then $ac = bc$.

Division Property If $a = b$ and $c \neq 0$, then $a \div c = b \div c$.

Reflexive Property For any real number a, $a = a$.

Symmetric Property If $a = b$, then $b = a$.

Transitive Property If $a = b$ and $b = c$, then $a = c$.

Substitution Property If $a = b$, then a can be substituted for b in any equation or expression.

EXAMPLE 1 Writing Reasons

Solve $10 - 2x = 3(x - 2) + 4$ and write a reason for each step.

SOLUTION

$10 - 2x = 3(x - 2) + 4$	Given
$10 - 2x = 3x - 6 + 4$	Distributive property
$10 - 2x = 3x - 2$	Simplify.
$12 - 2x = 3x$	Addition property of equality
$12 = 5x$	Addition property of equality
$\frac{12}{5} = x$	Division property of equality

Exercises for Example 1

Solve the equation and write a reason for each step.

1. $2x + 3 = 7x$

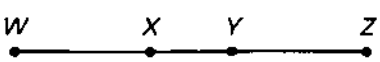
2. $4 + 2(3x + 5) = 11 - x$

3. $6x - 2 = -4(x - 1)$

4. $\frac{1}{5}x + 4 = 2x + \frac{3}{5}$

EXAMPLE 2 Using Properties of Length and Measure

In the diagram, $WY = XZ$. Show that $WX = YZ$.



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Practice C

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In Exercises 1–6, use the property to complete the statement.

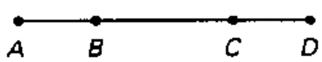
1. Multiplication property of equality: If $BD = 6$, then $\underline{\quad ? \quad}$ $(BD) = 2$.
2. Transitive property of equality: If $m\angle ABC = m\angle DEF$ and $\underline{\quad ? \quad} = m\angle STO$, then $\underline{\quad ? \quad}$.
3. Addition property of equality: If $m\angle STJ = 42°$, then $17° + m\angle STJ = \underline{\quad ? \quad}$.
4. Reflexive property of equality: $HS = \underline{\quad ? \quad}$.
5. Substitution property of equality: If $RL = 7.5$ and $LT = 10 - RL$, then $\underline{\quad ? \quad}$.
6. Symmetric property of equality: If $m\angle MCS = m\angle DBA$, then $\underline{\quad ? \quad}$.

Complete the argument, giving a reason for each step.

7.
$-2(3x - 4) = 3x + 12$	Given
$-6x + 8 = 3x + 12$	**a.** ?
$-9x + 8 = 12$	**b.** ?
$-9x = 4$	**c.** ?
$x = -\frac{4}{9}$	**d.** ?

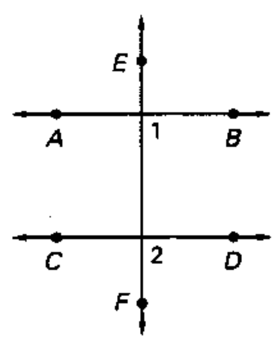
8.
$9 = 4x - 3(x - 2)$	Given
$9 = 4x - 3x + 6$	**a.** ?
$9 = x + 6$	**b.** ?
$3 = x$	**c.** ?
$x = 3$	**d.** ?

9.
$AB = CD$	Given
$BC = BC$	**a.** ?
$AB + BC = CD + BC$	**b.** ?
$AB + BC = AC$	**c.** ?
$CD + BC = BD$	**d.** ?
$AC = BD$	**e.** ?



In Exercises 10 and 11, give an argument for the statement, including a reason for each step.

10. If $\overleftrightarrow{AB} \perp \overleftrightarrow{EF}$, $\overleftrightarrow{CD} \perp \overleftrightarrow{EF}$, then $m\angle 1 = m\angle 2$.



11. If $m\angle 1 = 40°$ and $m\angle 2 = 50°$, then the angles are complementary.

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Exercises

SET I

In each of the following deductions, tell whether or not the third statement necessarily follows if the first two statements are accepted as true. If it does, write *valid* and, if it does not, name the error (*converse* error or *inverse* error) that would be made if the argument were accepted as correct.

1. If you see spots in front of your eyes, you're looking at a leopard.
   You're looking at a leopard.
   Therefore, you see spots in front of your eyes.

2. If you see strands in front of your eyes, your hair is too long.
   You don't see strands in front of your eyes.
   Therefore, your hair is not too long.

3. If you forgot your pencil, you may borrow one of mine.
   You forgot your pencil.
   Therefore, you may borrow a pencil from me.

4. If you brush your teeth with Brylcreem, you misunderstood the commercial.
   You didn't misunderstand the commercial.
   Therefore, you don't brush your teeth with Brylcreem.

5. All moths are attracted to candle flames.
   This insect is not a moth.
   Therefore, this insect is not attracted to candle flames.

6. All carbonated soft drinks contain bubbles.
   You are drinking something that is bubbly.
   Therefore, it is a carbonated soft drink.

7. No graduate of the White Elephant Memory School ever forgets.
   Eloise is very forgetful.
   Therefore, Eloise did not graduate from the White Elephant Memory School.

8. The students will stop paying attention if the class is boring.
   The class isn't boring.
   Therefore, the students will pay attention.

SET II

In each of the following exercises, two statements are given that are to be accepted as true. If possible, write a third statement that can be deduced from these statements. Otherwise, write "no deduction possible."

1. If I have reached the party to whom I am speaking, then I have dialed correctly.
   I have indeed reached the party to whom I am speaking.

2. If the Jolly Green Giant started turning blue, he should put on a sweater.
   The Jolly Green Giant has not started to turn blue.

3. If there is a fly in your soup, then you shouldn't be too quick to swallow each spoonful.
   You may swallow each spoonful quickly.

4. If I had a chimp for a nephew, then I'd be a monkey's uncle.
   I'm a monkey's uncle.

5. All Polaroid cameras take self-developing pictures.
   That camera is not a Polaroid.

6. All night owls hoot it up.
   Fred never gives a hoot.

7. No flying saucer can travel faster than the speed of light.
   The object hovering overhead is not a flying saucer.

8. His name ends in "o" if he is one of the Marx brothers.
   Groucho's name ends in "o."

SET III

The first sentence of the ad on the next page is a conditional statement that most people would probably accept as true. Compare it with the last sentence of the ad. Assuming that "you know just what to do" means that you will decide to buy a Volkswagen station wagon, is the ad's logic valid? Does this conclusion follow logically from what has been said before? Explain.