

**Pop Quiz.**

**Place everything under your desk except a pencil.**

1. Through any two points there exists \_\_\_\_\_.
2. If two planes intersect, then their intersection is a \_\_\_\_\_.
3. A line contains \_\_\_\_\_.
4. If two points lie in a plane, then the \_\_\_\_\_  
\_\_\_\_\_ lies in the plane.
5. If two lines intersect, then their intersection is \_\_\_\_\_  
\_\_\_\_\_.
6. Through any three noncollinear points there exists  
\_\_\_\_\_.
7. A plane contains \_\_\_\_\_.

## Bellwork

### 09/14/2011

1. Decide whether the statement "Two planes can intersect in exactly one point R" is true or false. If false, give a reason.

## Geometry

### 2.5 Reason Using Properties from Algebra Standard(s): 7

#### Vocabulary:

1. **Equation:** Two expressions separated by an equal sign.
2. **To Solve an Equation:** Using the algebraic properties to isolate a variable.

#### KEY CONCEPT

*For Your Notebook*

##### Algebraic Properties of Equality

Let  $a$ ,  $b$ , and  $c$  be real numbers.

<b>Addition Property</b>	If $a = b$ , then $a + c = b + c$ .
<b>Subtraction Property</b>	If $a = b$ , then $a - c = b - c$ .
<b>Multiplication Property</b>	If $a = b$ , then $ac = bc$ .
<b>Division Property</b>	If $a = b$ and $c \neq 0$ , then $\frac{a}{c} = \frac{b}{c}$ .
<b>Substitution Property</b>	If $a = b$ , then $a$ can be substituted for $b$ in any equation or expression.

#### THEOREMS

*For Your Notebook*

##### THEOREM 2.1 Congruence of Segments

Segment congruence is reflexive, symmetric, and transitive.

<b>Reflexive</b>	For any segment $AB$ , $\overline{AB} \cong \overline{AB}$ .
<b>Symmetric</b>	If $\overline{AB} \cong \overline{CD}$ , then $\overline{CD} \cong \overline{AB}$ .
<b>Transitive</b>	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$ , then $\overline{AB} \cong \overline{EF}$ .

*Proofs:* p. 137; Ex. 5, p. 121; Ex. 26, p. 118

##### THEOREM 2.2 Congruence of Angles

Angle congruence is reflexive, symmetric, and transitive.

<b>Reflexive</b>	For any angle $A$ , $\angle A \cong \angle A$ .
<b>Symmetric</b>	If $\angle A \cong \angle B$ , then $\angle B \cong \angle A$ .
<b>Transitive</b>	If $\angle A \cong \angle B$ and $\angle B \cong \angle C$ , then $\angle A \cong \angle C$ .

*Proofs:* Ex. 25, p. 118; Concept Summary, p. 114; Ex. 21, p. 137

#### KEY CONCEPT

*For Your Notebook*

##### Distributive Property

$a(b + c) = ab + ac$ , where  $a$ ,  $b$ , and  $c$  are real numbers.

#### KEY CONCEPT

*For Your Notebook*

##### Reflexive Property of Equality

<b>Real Numbers</b>	For any real number $a$ , $a = a$ .
<b>Segment Length</b>	For any segment $AB$ , $AB = AB$ .
<b>Angle Measure</b>	For any angle $A$ , $m\angle A = m\angle A$ .

##### Symmetric Property of Equality

<b>Real Numbers</b>	For any real numbers $a$ and $b$ , if $a = b$ , then $b = a$ .
<b>Segment Length</b>	For any segments $AB$ and $CD$ , if $AB = CD$ , then $CD = AB$ .
<b>Angle Measure</b>	For any angles $A$ and $B$ , if $m\angle A = m\angle B$ , then $m\angle B = m\angle A$ .

##### Transitive Property of Equality

<b>Real Numbers</b>	For any real numbers $a$ , $b$ , and $c$ , if $a = b$ and $b = c$ , then $a = c$ .
<b>Segment Length</b>	For any segments $AB$ , $CD$ , and $EF$ , if $AB = CD$ and $CD = EF$ , then $AB = EF$ .
<b>Angle Measure</b>	For any angles $A$ , $B$ , and $C$ , if $m\angle A = m\angle B$ and $m\angle B = m\angle C$ , then $m\angle A = m\angle C$ .

## Write Reasons for Each Step

Solve  $3x+8=-4x-34$ . Write a reason for each step.

$$3x+8 = -4x-34$$

$$3x+8+4x = -4x-34+4x$$

$$7x+8 = -34$$

$$7x+8-8 = -34-8$$

$$7x = -42$$

$$\frac{7x}{7} = \frac{-42}{7}$$

$$x = -6$$

Given

Add. Prop. of =  
Simplify

Subtraction prop.  
of =

Simplify

Division Prop. of =  
Simplify

Solve  $14x+3(7-x)=-1$ . Write a reason for each step.

$$14x+3(7-x) = -1$$

$$14x+21-3x = -1$$

$$11x+21 = -1$$

$$11x+21-21 = -1-21$$

$$11x = -22$$

$$\frac{11x}{11} = \frac{-22}{11}$$

$$x = -2$$

Given

Distributive Prop.  
Simplify

Subtraction Prop. of =  
Simplify

Division Prop. of =  
Simplify

## Use Properties

Substitution Property of Equality: If  $a = 20$ , then  $5a = \underline{\quad? \quad}$ .  
 $5(20) = 100$

Symmetric Property of Equality: If  $AB = CD$ , then  $CD = \underline{\quad? \quad}$ .  
 $AB$

Addition Property of Equality: if  $RS = TU$ , then  $RS + 20 = \underline{\quad? \quad}$ .  
 $TU + 20$

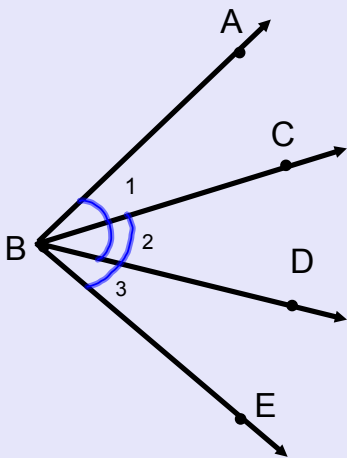
Multiplication Property of Equality: If  $m \angle 1 = m \angle 2$ , then  $3m \angle 1 = \underline{\quad? \quad}$ .  
 $3m \angle 2$

Reflexive Property of Equality: If  $x$  is a real number, then  $x = \underline{\quad? \quad}$ .  
 $x$

Transitive Property of Equality: If  $m \angle E = m \angle F$  and  $m \angle F = m \angle G$ , then  $\underline{\quad? \quad}$ .  
 $m \angle E = m \angle G$

## Use Properties of Equality

In the diagram  $m\angle ABD = m\angle CBE$ . Show that  $m\angle 1 = m\angle 3$ .



$$m\angle ABD = m\angle CBE$$

Given

$$[m\angle 1 + m\angle 2] = m\angle ABD$$

∠ add.  
pos.

$$[m\angle 2 + m\angle 3] = m\angle CBE$$

$$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$$

Substitution  
Prop. of =

$$m\angle 1 + m\angle 2 - m\angle 2 = m\angle 2 + m\angle 3 - m\angle 2$$

Subtraction  
prop. of =

$$m\angle 1 = m\angle 3$$

Simplify

## Complete Logical Arguments

Complete the logical argument by giving a reason for each step.

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

$$5x - 15 = 4x + 8$$

$$x - 15 = 8$$

$$x = 23$$

**Given**

a.     ?

Distributive Prop.

b.     ?

Subtraction  
Prop. of =

c.     ?

Addition  
Prop. of =

# Homework Assignment

## Worksheet 2.5B



