Key Concepts

Summary — **Properties of Equality**

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 $a \cdot c = b \cdot c$.
Division Property	If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$.
Reflexive Property	$a = a$
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 b can replace a in any expression.

You also assume that other properties from algebra are true.

Key Concepts

Property — **The Distributive Property**

$a(b + c) = ab + ac$

IXL #5 - I.2 & I.3 due Friday, Oct. 5th!

Key Concepts

Summary — **Properties of Congruence**

Reflexive Property	$\overline{AB} \cong \overline{AB}$ $\angle A \cong \angle A$
Symmetric Property	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$. If $\angle A \cong \angle B$, then $\angle B \cong \angle A$.
Transitive Property	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$. If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$.

Name each property being used.

1. $\overline{AB} \cong \overline{AB}$

Refl. Prop of Cong.

2. If x = 2 and x = y, then y = 2.

Transitive Prop. of Eq.

3. If $x = 3$ and $2x + 7 = 4y$, then $2(3) + 7 = 4y$.

Subst. prop of eq.

4. If $\angle A \cong \angle B$, then $\angle B \cong \angle A$

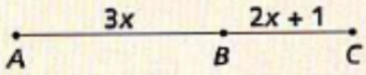
Symm. prop of cong.

5. Which of the following is an example of the Reflexive Property of Equality?

- If $x = -2$, then $x + 4 = -2 + 4$.
- $x - 2 = x - 2$
- If $y = x + 4$, then $x + 4 = y$.
- If $x - 2 = y$ and $y = 4$, then $x - 2 = 4$.

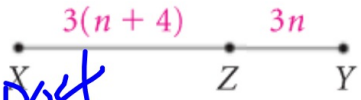
6. Fill in the missing information in the proof below.

Given: $AC = 36$



Statements	Justifications
1. $AB + BC = AC$	1. Seg. add post.
2. $3x+2x+1=36$	2. Substitution
3. $5x + 1 = 36$	3. Combine like terms
4. $5x=35$	4. Subtraction Property of Equality
5. $x = 7$	5. Division prop. of Eq.

1.) Solve for n.



Given: $XY = 42$

$XZ + ZY = XY$	**a.** Seg. Add post.
$3(n + 4) + 3n = 42$	**b.** subst prop. of eq.
$3n + 12 + 3n = 42$	**c.** Dist. Prop.
$6n + 12 = 42$	**d.** combine like terms
$6n = 30$	**e.** Subtr. prop of eq.
$n = 5$	**f.** Division prop. of eq.

2.) **Algebra** **Give a reason for each step.**

$\frac{1}{2}x - 5 = 10$	Given
$2\left(\frac{1}{2}x - 5\right) = 20$	**a.** mult. prop. of eq
$x - 10 = 20$	**b.** Dist. prop of eq.
$x = 30$	**c.** Add. prop of eq.

3.)

$5(x + 3) = -4$	Given	
$5x + 15 = -4$	a. Dist. prop.	
$5x = -19$	b. Subt. prop.	
$x = -\frac{19}{5}$	c. Division prop.	

Use the given property to complete each statement.

4.) Addition Property of Equality

If x = 5, then x + 3 = 8

5+3

5.) Division Property of Equality

If $\frac{2(AX)}{2} = \frac{4(BY)}{2}$, then AX = 2BY

6.) Distributive Property

2(4x + 5) = 8X + 10

7.) Transitive Property of Congruence

If $\angle B \cong \angle T$ and $\angle B \cong \angle Y$, then $\angle T \cong \angle Y$