Warm Up

1. Solve: $6x + 2 = -3x - 16$

2. Solve: $-4(x - 8) = -16$

$-4x + 32 = -16$
$-32 \quad -32$
$-4x = -48$
$x = 12$

3. Solve for w: $P = 2L + 2w$

2-5 Reason using Algebra Properties

Algebraic Properties of Equality:

Addition Property $x - 5 = 8$ $+5 \quad +5$

Subtraction Property

Multiplication Property

Division Property

Reflexive Property

Symmetric Property $5 = x$ $x = 5$

Transitive Property

Substitution Property

Distributive Property

Ex 1 Solve the equation for x. Give a reason for each step.

Statements	Reasons
$3x + 8 = -4x - 34$	Given
$+4x \quad +4x$	Addition Prop. of Eq.
$7x + 8 = -34$	
$-8 \quad -8$	Sub. prop. of Eq.
$\frac{7x}{7} = \frac{-42}{7}$	Div. prop. of Eq.
$x = -6$	

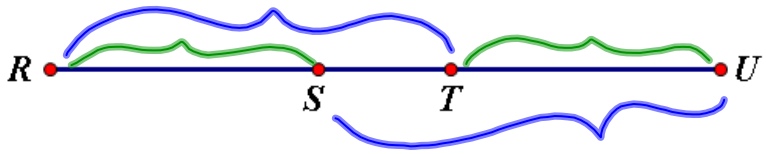
Ex 2 Solve the equation for x. Give a reason for each step.

$60 = -3(8x - 4)$	Given
$60 = -24x + 12$ $-12 \quad -12$	Dist. Prop.
$\frac{48}{-24} = \frac{-24x}{-24}$	Sub. prop. of Eq.
$-2 = x$	Div. Prop. of Eq.
$x = -2$	Sym. Prop. of Eq.

Ex 3 Solve the equation for x. Give a reason for each step.

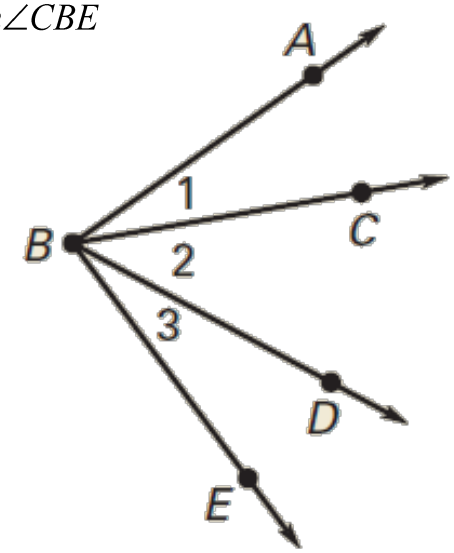
$2x + 7 = 5(x - 4)$	Given
$2x + 7 = 5x - 20$ $-2x \quad -2x$	Dis. P
$7 = 3x - 20$ $+20 \quad +20$	Subt. P Add. P
$\frac{27}{3} = \frac{3x}{3}$	Div. P
$9 = x$ $x = 9$	Symmetric Prop.

Ex 4 If $RT = SU$, prove that $RS = TU$



Statements	Reasons
$RT = SU$	Given
$RS + ST = RT$	Seg. Add. Post.
$ST + TU = SU$	
$RS + ST = ST + TU$	Substitution
$RS = TU$	Subtraction Prop. of Eq.

Ex. 5 In the diagram, $m\angle ABD = m\angle CBE$
Prove that $m\angle 1 = m\angle 3$



Ex. 6 Use the property to complete the statement.

Substitution Property of Equality:

If $x = 5$, then $x + y =$ $5 + y$

Transitive Property of Equality:

If $AB = CD$ and $CD = EF$, then $AB = EF$

Ex. 7 Use the property to complete the statement.

Symmetric Property of Equality:

If $AB = 5$, then $5 = AB$

Addition Property of Equality:

If $AB = CD$, then $AB + 5 = CD + 5$