

Algebraic Proofs Reasons

Name Key Dayz
Period _____ Date _____

	<u>Name of Property</u>	<u>Statement of Property</u>	<u>In my own words</u>	<u>Examples</u>
Most Helpful	Addition Property of Equality	If $a = b$, then $a + c = b + c$	Adding a # to both Sides will keep it equal	$3x - 2 = 10$ $\quad + 2 \quad + 2$ $3x = 12$
	Subtraction Property of Equality	If $a = b$, then $a - c = b - c$	Subtracting a # from both Sides will keep it equal	$x + 5 = 20$ $\quad - 5 \quad - 5$ $x = 15$
	Multiplication Property of Equality	If $a = b$, then $ac = bc$	Multiplying by the same # on both sides \rightarrow equal	(a) $\frac{1}{2}x = 4$ (a) $x = 8$
	Division Property of Equality	If $a = b$ and $c \neq 0$, then $a / c = b / c$	Dividing by the same # on both sides \rightarrow equal	$3x = 9$ $\frac{3}{3}x = \frac{9}{3}$ $x = 3$
	Distributive Property of Equality	For any real numbers a , b , and x : $a(b + c) = ab + ac$	Multiply outside by both inside terms.	$5(x + 2)$ $5x + 10$
	Simplify (Combine Like Terms)	For any real numbers a , b , and x : $ax + bx = (a + b)x$	Add / Subtract coefficients on same variables	$2x^2 + 4x^2$ $6x^2$
	Symmetric Property of Equality	If $a = b$, then $b = a$	Change order, means something	$2x = 4$ $4 = 2x$
Sometimes Helpful	Reflexive Property of Equality	For any real number a : $a = a$	Something = itself	$3 = 3$
	Transitive Property of Equality	If $a = b$ and $b = c$, then $a = c$	Skip the middle	$x = 12$, $y = 12$ $x = y$
	Substitution Property of Equality	If $a = b$, then a can be substituted for b in any expression or	plug in a value.	$x = 3$ $2x = 2(3) = 6$

Algebraic Proofs Practice

Name _____

Period _____ Date _____

1. Solve $48 = 5(2x - 7) + 3$.
Justify each step. You may not use all the rows in the proof.

Statement	Reason
$48 = 5(2x - 7) + 3$	Given
$48 = 10x - 35 + 3$	Distributive Property
$48 = 10x - 32$	Simplify
$80 = 10x$	Addition Property
$8 = x$	Division Property
$x = 8$	Symmetric Property

Name: Key

Date: _____

Period: _____

GSE Algebra 1

Day 02 - Algebraic Proofs Notes

1.

$55z - 3(9z + 12) = -64$	Given
$55z - 27z - 36 = -64$	Distributive Property
$28z - 36 = -64$	Combine Like Terms/Simplify
$28z = -28$	Additive Property
$z = -1$	Division Property

2.

$\frac{n+5}{3} = -9$	Given
$3\left(\frac{n+5}{3}\right) = 3(-9)$	Multiplication Property
$n+5 = -27$	Simplify
$n = -32$	Subtraction Property

3.

$7 - 4t = 3t$	Given
$7 = 7t$	Additive Property
$1 = t$	Division Property
$t = 1$	Symmetric Property

4.

$3(x+1) = 15$	Given
$3x + 3 = 15$	Distributive Property
$3x = 12$	Subtraction Property
$x = 4$	Division Property