

Name: \_\_\_\_\_ Date: \_\_\_\_\_

HW: Justifying Equations with Properties

Solve each equation and justify each step

<b>1) <math>4x = 12x + 32</math></b>	
1.	1. Given
2. $4x - 12x = 12x + 32 - 12x$	2.
3. $-8x = 32$	3.
4. $\frac{-8x}{-8} = \frac{32}{-8}$	4.
5.	5. Substitution Property

<b>3) <math>60x + 153 = 9x + 51</math></b>	
1.	1.
2.	2. Subtraction property
3. $51x + 153 = 51$	3.
4. $51x + 153 - 153 = 51 - 153$	4.
5.	5. Substitution Property
6. $\frac{51x}{51} = \frac{-102}{51}$	6.
7. $x = -2$	7. Substitution Property

<b>5) <math>-3(x + 2) = 16 - x</math></b>	
1.	1.
2. $-3x - 6 = 16 - x$	2.
3. $-3x - 6 + 3x = 16 - x + 3x$	3.
4.	4. Substitution Property
5.	5. Subtraction Property
6. $-22 = 2x$	6.
7.	7. Division Property
8.	8. Substitution

<b>2) <math>28 + 12x = 8x - 4</math></b>	
1.	1.
2. $28 + 12x + 4 = 8x - 4 + 4$	2.
3.	3. Substitution Property
4.	4. Subtraction Property
5. $32 = -4x$	5.
6.	6. Division Property
7. $-8 = x$	7.

<b>4) <math>-4x + 10 = -5x + 18</math></b>	
1.	1.
2. $-4x + 10 + 5x = -5x + 18 + 5x$	2.
3. $x + 10 = 18$	3.
4. $x + 10 - 10 = 18 - 10$	4.
5. $x = 8$	5.

<b>6) <math>-x - 2(9 - 8x) = 12</math></b>	
1.	1.
2.	2. Distributive Property
3.	3. Substitution
4. $-18 + 15x + 18 = 12 + 18$	4.
5. $15x = 30$	5.
6. $\frac{15x}{15} = \frac{30}{15}$	6.
7. $x = 2$	7.

7) $6(x - 6) = x(16 - 7)$	
1.	1.
2.	2. Distributive Property
3.	3. Substitution Property ←
4.	4. Addition Property
5.	5. Subtraction Property
6.	6. Division Property
7.	7. Substitution Property

Hint: do  
you see  
like  
terms?

8) $\frac{1}{4}x + 10 = 2$	
1.	1.
2.	2. Subtraction Property
3.	3. Substitution Property
4.	4. $4\left(\frac{1}{4}x\right) = 4(-8)$
5.	5. Substitution Property

Now solve the following equations. You do not need to follow proof format.

9.  $8x - 5 = 2x + 1$

13.  $6 = 1 - 2x + 5$

10.  $-8 = -2(x + 4)$

14.  $-3(4x + 3) + 4(6x + 1) = 43$

11.  $-18 - 6k = 6(1 + 3k)$

15.  $-(7 - 4x) = 9$

12.  $-20 = -4x - 6x$

16.  $3n - 5 = -8(6 + 5n)$