Name:_____ Date:_____ Period:_____

L3 Algebraic Properties WS

For 1-10: Match each of the following properties to the description and the example. You will use each property twice, once for a definition and once for an example. WRITE LETTER ANSWERS ONLY

A. Commutative Property of Addition	B. Commutative Property of Multiplication	C. Associative Property of Addition	D. Associative Property of Multiplication	E. Distributive Property

1. _____ Multiply a number or expression outside of parentheses by each term inside the parentheses.

2. _____ Numbers can be added in any order without changing the value of the expression.

3. _____ If three numbers are added together, they may be grouped in any order and will still have the same sum.

4. _____ If three numbers are multiplied together, they may be grouped in any order and will still have the same product.

5. _____ Numbers can be multiplied in any order without changing the value of the expression.

Match the definition to its property (use the same properties from above-LETTER ONLY):

6. _____ $a + b = b + a$	7. _____ $5(x + 3) = 5x + 15$	8. _____$(2 + 3) + 1 = 2 + (3 + 1)$
9. _____ $7 * 10 = 10 * 7$	10. _____$2 * (9 * 5) = (2 * 9) * 5$	

Use the following table to complete questions 11-15.

$x + y = y + x$	$7(x - 1) = 7x - 7$	$8 * 2 = 2 * 8$
$ab + c = c + ab$	$(a + b) + c = a + (b + c)$	$(2 * 45) * 9 = 2 * (45 * 9)$
$x(y + z) = (y + z)x$	$5(x + 8) = 5x + 40$	$m + n = n + m$

11. Circle each equation above that shows the **commutative property of addition.**

12. Underline each equation above that shows the **commutative property of multiplication.**

13. Star each equation above that shows the **associative property of addition**.

14. Cross out each equation above the shows the **distributive property.**

15. You should still have one equation that you have not marked. What property is this equation showing?

Combine like terms and simplify:

16. $5x - 8 + 9x$	17. $x + 7 + 2x - 8$	18. $3x - 1 - 7x + 3$
19. $x + 5 + -3x - 8$	20. $x - 1 - 7x + 1$	21. $x^2 - 3x + 2x - 1$
22. $x^2 + 5x - 10x^2 - 9 + x$	23. $2xy + 10xy - 3x + z$	24. $a + b + 4b - 9a + 2a + a^2$

Preview: Solve each of the following equations (this should be review from last year!)

25. $x + 4 = 9$	26. $4x = 32$	27. $x - 9 = 10$
28. $2x = 26$	29. $x + 30 = 72$	30. $5x = 50$