NAME _____

Lesson 3.1 Mathematical Properties & Equivalent Expressions

Commutative Property: The order in which numbers are added does not change the sum. The order in which numbers are multiplied does not change the product.

$a + b = b + a$
$a \times b = b \times a$

Associative Property: The grouping of addends does not change the sum. The grouping of factors does not change the product.

$a + (b + c) = (a + b) + c$
$a \times (b \times c) = (a \times b) \times c$

Identity Property: The sum of an addend and 0 is the addend. The product of a factor and 1 is the factor.

$a + 0 = a$
$a \times 1 = a$

Properties of Zero: The product of a factor and 0 is 0. The quotient of the dividend 0 and any divisor is 0.

$a \times 0 = 0$
$0 \div a = 0$

Distributive Property: If two addends or the minuend and subtrahend in an equation are being multiplied by the same factor, the equation can be rewritten by factoring out the common factor.

$a \times (b + c) = (a \times b) + (a \times c)$
$a \times (b - c) = (a \times b) - (a \times c)$

Rewrite each expression using the property indicated.

	a	b
1.	associative: $(7 + 6) + y =$	identity: $724 + 0 =$
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2.	commutative: $z \times 8 =$	zero: $61 \times 0 =$
	_____	_____
3.	distributive: $6 \times (a + b) =$	zero: $0 \div 5 =$
	_____	_____
4.	commutative: $7 + y =$	associative: $5 \times (6 \times 3) =$
	_____	_____
5.	identity: $45 \times 1 =$	distributive: $(7 \times 3) + (7 \times 7) =$
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