



Objective 2 TEKS A.4.B Review

A.4.B Use the commutative, associative, and distributive properties to simplify algebraic expressions.

The properties listed below are true for all real numbers a , b , and c . Study the examples in the table to see how you can use the properties to write equivalent algebraic expressions.

Property name	Property statement	Example
Commutative Property	Of addition: $a + b = b + a$ Of multiplication: $ab = ba$	$3 + 4 = 4 + 3$ $3(4) = 4(3)$
Associative Property	Of addition: $(a + b) + c = a + (b + c)$ Of multiplication: $(ab)c = a(bc)$	$(3 + 4) + 5 = 3 + (4 + 5)$ $(3 \times 4)5 = 3(4 \times 5)$
Distributive Property	$a(b + c) = ab + bc$ $a(b - c) = ab - ac$	$3(4 + 5) = (3 \times 4) + (3 \times 5)$ $3(4 - 5) = (3 \times 4) - (3 \times 5)$

EXAMPLE What is the simplified expression for $7(a + 2) + 3(2 - a)$?

Expression	Property
$7(a + 2) + 3(2 - a) = 7a + 14 - 6 + 3a$	<i>Distributive property</i>
$= 7a + 3a + 14 - 6$	<i>Commutative property of addition</i>
$= (7a + 3a) + (14 - 6)$	<i>Associative property of addition</i>
$= (7 + 3)a + (14 - 6)$	<i>Distributive property</i>
$= 10a + 8$	<i>Simplified expression</i>

The simplified expression is $10a + 8$.

YOU DO IT What are the missing expressions or properties that allow you to simplify $5 - 2(5 - c) + 6c + 10$?

Expression	Property
$5 - 2(5 - c) + 6c + 10 = 5 - 10 + 2c + 6c + 10$	<u>Distributive</u>
$= 2c + 6c + 5 - 10 + 10$	<u>property</u>
$= (2 + 6)\underline{\mathbf{c}} + 5 - 10 + 10$	<u>Commutative</u>
$= \underline{\mathbf{8c}} + 5 - 10 + 10$	<u>property of addition</u>
$= \underline{\mathbf{8c + 5}}$	<i>Distributive property</i>
	<i>Simplify.</i>
	<i>Simplified expression</i>