

Expression Switch Lab

Use operation properties to rewrite expressions.

GRADE 6 • 6.PAR.6.5

6.PAR.6.5 "Apply the properties of operations to identify and generate equivalent expressions."

NAME _____

DATE _____

MOVE, GROUP, AND DISTRIBUTE

The distributive property lets you multiply a factor by every term inside parentheses. You can also reverse the process by factoring out a common factor. The commutative and associative properties let you reorder or regroup terms without changing the value.

WORKED EXAMPLE

Write an equivalent expression for $7(x + 13)$.

1. Start with $7(x + 13)$.
2. Multiply 7 by x to get $7x$.
3. Multiply 7 by 13 to get 91.
4. Write $7x + 91$.

Answer: $7x + 91$

PRACTICE 6 problems

- 1** Write an equivalent expression for $4(x + 6)$.

ANSWER _____

- 2** Write $9x + 45$ as a product by factoring out the greatest common factor.

ANSWER _____

- 3** Use the commutative property to write an equivalent expression for $12 + 5x$.

ANSWER _____

- 4** Simplify: $2(3x + 8) + x$

ANSWER _____

- 5** Simplify: $6(x + 4) + 2x$

ANSWER _____

- 6** Write $15x - 20$ as a product by factoring out the greatest common factor.

ANSWER _____

APPLY IT Show your work

- 1** A game creator makes 8 prize bags. Each bag has x trading cards and 3 stickers. Write two equivalent expressions for the total number of items in all the bags.

WORK SPACE

ANSWER _____

- 2** A robotics team has $18x$ connector pieces and 30 sensors. They want to pack the supplies into 6 identical kits. Write the total number of supplies as a factored expression that shows 6 equal kits.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Are $4(2x + 9) + 3x$ and $11x + 36$ equivalent expressions? Explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Write an equivalent expression for $4(x + 6)$.	$4x + 24$
2	Write $9x + 45$ as a product by factoring out the greatest common factor.	$9(x + 5)$
3	Use the commutative property to write an equivalent expression for $12 + 5x$.	$5x + 12$
4	Simplify: $2(3x + 8) + x$	$7x + 16$
5	Simplify: $6(x + 4) + 2x$	$8x + 24$
6	Write $15x - 20$ as a product by factoring out the greatest common factor.	$5(3x - 4)$

PART 2 • APPLY IT

- $8(x + 3)$ and $8x + 24$** There are 8 groups of $x + 3$ items, so the total is $8(x + 3)$. Distribute 8 to get $8x + 24$.
- $6(3x + 5)$** Factor 6 from both terms: $18x + 30 = 6(3x + 5)$. Each kit has $3x + 5$ supplies.

CHALLENGE

Yes. Distributing gives $8x + 36 + 3x$, which simplifies to $11x + 36$.

Accept equivalent expressions with terms written in a different order. For items that ask students to factor, the expression must show the requested greatest common factor.