LESSON MAKER PRO

Expression Moves

Group, distribute, and evaluate

GRADE 7 · 7.A.4

7.A.4 "Use order of operations and properties of operations to generate and evaluate equivalent numerical and algebraic expressions. Use properties of operations (associative, commutative..."

NAME _____ DATE _____

TWO WAYS TO CALCULATE

Start with the innermost grouping symbols, following the order of operations inside each group. Then evaluate any remaining exponents, multiply or divide from left to right, and add or subtract from left to right. You can also distribute a factor to each term inside a group to make an equivalent expression.

WORKED EXAMPLE

Evaluate $(7/11) \times (22 + 33)$. Check by distributing.

1. First, $22 + 33 = 55$.
2. Then $(7/11) \times 55 = 35$.
3. Check: $(7/11) \times 22 + (7/11) \times 33 = 14 + 21 = 35$.

Answer: 35

PRACTICE 6 problems

1 Evaluate $6 + 4 \times (8 - 3)$.

ANSWER _____

2 Evaluate $(12 - 4)^2 / 8$.

ANSWER _____

3 Evaluate $(3/4) \times (16 - 8) + 2^3$.

ANSWER _____

4 Use the distributive property to rewrite $6 \times (x + 3)$ without parentheses.

ANSWER _____

5 Use the distributive property to evaluate $4 \times (3/2 + 5/4)$.

ANSWER _____

6 Are $2 \times (x - 4) + 3^2$ and $2x + 1$ equivalent? Show one step to explain.

ANSWER _____

APPLY IT Show your work

1 You and 3 friends each buy a $4.50 game add-on. Your group uses one $8 coupon on the total cost and splits the remaining cost equally. Write an expression and find what each person pays.

WORK SPACE

ANSWER _____

2 At an arcade, you earn 4 tickets for each puzzle and 3 tickets for each bonus round. You complete 6 puzzles and 6 bonus rounds, then spend 8 tickets. Write an expression using the distributive property and find how many tickets you have left.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A classmate claims that $3 \times (x + 4)^2 = 3x^2 + 48$ for every x. Is the claim true? If not, give a value of x that disproves it and expand the left side correctly.

WORK SPACE AND ANSWER

ANSWER KEY

Expression Moves

GRADE 7 · 7.A.4

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Evaluate $6 + 4 \times (8 - 3)$.	**26**
2	Evaluate $(12 - 4)^2 / 8$.	**8**
3	Evaluate $(3/4) \times (16 - 8) + 2^3$.	**14**
4	Use the distributive property to rewrite $6 \times (x + 3)$ without parentheses.	**6x + 18**
5	Use the distributive property to evaluate $4 \times (3/2 + 5/4)$.	**11**
6	Are $2 \times (x - 4) + 3^2$ and $2x + 1$ equivalent? Show one step to explain.	**Yes. $2 \times (x - 4) + 3^2 = 2x - 8 + 9 = 2x + 1$.**

PART 2 · APPLY IT

1. **$(4 \times 4.50 - 8) / 4 = \$2.50$ per person** The four add-ons cost $18. Subtract the $8 coupon, then divide the remaining $10 by 4.
2. **$6 \times (4 + 3) - 8 = 34$ tickets** Combine the tickets from one puzzle and one bonus round, then multiply by 6. Subtract the 8 tickets spent.

CHALLENGE

No. At $x = 1$, the left side is 75 and the right side is 51. The correct expansion is $3x^2 + 24x + 48$.

Accept equivalent expressions for the word problems and any valid counterexample for the challenge. For problem 6, require a step showing distribution and simplification.