LESSON MAKER PRO

Show It Differently

Rewrite expressions to reveal what they mean.

GRADE 8 · 8A.AF.A

8A.AF.A "Expressions can be rewritten in equivalent forms by using algebraic properties, including properties of addition, multiplication, and exponentiation, to make different characteristics or features visible."

NAME _____ DATE _____

EQUIVALENT EXPRESSIONS

To remove parentheses, multiply each term inside by the number outside. Then combine terms with the same variable part. The new expression has the same value for every x.

WORKED EXAMPLE

Simplify 7(x + 11) + 13x.

1. Distribute: 7x + 77 + 13x
2. Group like terms: (7x + 13x) + 77
3. Combine: 20x + 77

Answer: 20x + 77

PRACTICE 6 problems

1 Rewrite 4(x + 3) without parentheses.

ANSWER _____

2 Rewrite 5(2x - 6) without parentheses.

ANSWER _____

3 Simplify 3(x + 8) + 2x.

ANSWER _____

4 Simplify 6x + 2(9 - x).

ANSWER _____

5 Factor 8x + 24 using the greatest common factor.

ANSWER _____

6 Simplify 3(2x - 4) - 2(x + 5).

ANSWER _____

APPLY IT Show your work

1 Three friends each pay $6 to enter a gaming café and $4 per game. Each friend plays x games. Write two equivalent expressions for their total cost: one showing each friend's cost and one showing the group's entry and game costs.

WORK SPACE

ANSWER _____

2 An amusement park charges $18 for entry and $6 for each ride. If you take x rides, rewrite your total cost, 18 + 6x, as a product. What does the constant inside parentheses represent?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Are 2(3x + 8) + 4(x - 3) and 5(2x + 1) - 1 equivalent for every x? Rewrite both expressions to explain your answer.

WORK SPACE AND ANSWER

ANSWER KEY

Show It Differently

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Rewrite 4(x + 3) without parentheses.	**4x + 12**
2	Rewrite 5(2x - 6) without parentheses.	**10x - 30**
3	Simplify 3(x + 8) + 2x.	**5x + 24**
4	Simplify 6x + 2(9 - x).	**4x + 18**
5	Factor 8x + 24 using the greatest common factor.	**8(x + 3)**
6	Simplify 3(2x - 4) - 2(x + 5).	**4x - 22**

PART 2 · APPLY IT

1. **3(6 + 4x) and 18 + 12x** Multiply each friend's cost by 3, then distribute to show $18 in entry fees and $12 per round of games played by all three friends.
2. **6(x + 3). The 3 represents the entry fee measured in $6 units.** Factor 6 from both terms. Since 18 ÷ 6 = 3, the entry fee equals the cost of three rides.

CHALLENGE

Yes. 2(3x + 8) + 4(x - 3) = 6x + 16 + 4x - 12 = 10x + 4, and 5(2x + 1) - 1 = 10x + 5 - 1 = 10x + 4.

Accept terms in a different order when the expressions remain equivalent. For the challenge, students must simplify both expressions, not just test one value of x.