LESSON MAKER PRO

# Match the Expressions

*Simplify both sides to test whether they always match.*

**GRADE 7 · MA.7.AR.1.2**

**MA.7.AR.1.2** "Determine whether two linear expressions are equivalent."

NAME _____ DATE _____

## THE BIG IDEA

Two linear expressions are equivalent when they have the same value for every value of x. Simplify each expression by distributing and combining like terms, then compare the results.

## WORKED EXAMPLE

Are $5(x + 6) - x$ and $4x + 30$ equivalent?

1. Distribute: $5(x + 6) - x = 5x + 30 - x$.
2. Combine like terms: $5x + 30 - x = 4x + 30$.
3. The simplified expression matches the second expression.

**Answer: Yes, the expressions are equivalent.**

## PRACTICE 6 problems

**1** Are $9x + 12$ and $8x + x + 12$ equivalent?

**ANSWER** _____

**2** Are $7(x + 8)$ and $7x + 54$ equivalent?

**ANSWER** _____

**3** Are $8(2x - 9)$ and $16x - 72$ equivalent?

**ANSWER** _____

**4** Are $21x - 17$ and $21x + 17$ equivalent?

**ANSWER** _____

**5** Are $13(x - 7)$ and $13x - 91$ equivalent?

**ANSWER** _____

**6** Are $(x + 18)/9$ and $x/9 + 2$ equivalent?

**ANSWER** _____

## APPLY IT Show your work

**1** At an esports tournament, each round gives a player 14 points. After x rounds, the player also gets a 9-point bonus. Sam writes 14x + 9. Riley writes 7(2x) + 9. Are their expressions equivalent? Explain.

WORK SPACE

**ANSWER** _____

**2** Jada is saving for wireless headphones. She saves $14 each week for x weeks and receives a $9 gift card. Jada writes 14x + 9. Her cousin writes 7(2x + 9). Are their expressions equivalent? Explain.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

Without plugging in a value for x, decide whether 16(3x - 8) + 9x and 57x - 128 are equivalent. Explain your reasoning.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Match the Expressions

**GRADE 7 · MA.7.AR.1.2**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Are 9x + 12 and 8x + x + 12 equivalent? | **Yes, both simplify to 9x + 12.** |
| 2 | Are 7(x + 8) and 7x + 54 equivalent? | **No. 7(x + 8) simplifies to 7x + 56.** |
| 3 | Are 8(2x - 9) and 16x - 72 equivalent? | **Yes, both simplify to 16x - 72.** |
| 4 | Are 21x - 17 and 21x + 17 equivalent? | **No. The constant terms are different.** |
| 5 | Are 13(x - 7) and 13x - 91 equivalent? | **Yes, both simplify to 13x - 91.** |
| 6 | Are (x + 18)/9 and x/9 + 2 equivalent? | **Yes, because (x + 18)/9 = x/9 + 18/9 = x/9 + 2.** |

## PART 2 · APPLY IT

1. **Yes, the expressions are equivalent.** Simplify Riley's expression: 7(2x) + 9 = 14x + 9. It matches Sam's expression.
2. **No, the expressions are not equivalent.** Simplify the cousin's expression: 7(2x + 9) = 14x + 63. This does not match 14x + 9.

## CHALLENGE

**Yes. 16(3x - 8) + 9x = 48x - 128 + 9x = 57x - 128, so the expressions are equivalent.**

Accept any correct simplification that shows whether both expressions become the same expression. For explanations, students should use distribution and combining like terms rather than testing only one value of x.