

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

CHALLENGE

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

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

- Yes, the expressions are equivalent.** Simplify Riley's expression: $7(2x) + 9 = 14x + 9$. It matches Sam's expression.
- 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 .