Equivalent Expressions

Lesson 6-6

Name: _____ Date: _____ Class: _____

Key Vocabulary Level 1 support

Picture first, then the word, then a plain-language meaning. Say each word out loud.

2x + 4 and 2(x + 2): when x = 3, both = 10; when x = 7, both = 18 — always the same

Equivalent

Expressions that always have the same value.

3x + 2x + 5 simplifies to 5x + 5 — fewer terms, same value

Simplify

To write an expression in a shorter, simpler way.

3x and 7x are like terms (both x); 3x and 3y are NOT (x vs y); 3x and 3x² are NOT (x vs x²)

Like Terms

Terms with the same letter, like 2x and 5x.

4n + 3n = 7n — add the coefficients (4 + 3 = 7) and keep the variable (n)

Combine

To add or subtract terms with the same letter.

In 5x + 3, the coefficient of x is 5 — when x = 2, the 5x part equals 10

Coefficient

The number in front of a letter, like the 3 in 3x.

Key Ideas & Notes

- At the music studio, two producers wrote formulas for the cost of renting equipment.
- Producer A wrote $3x + 2x + 10$, and Producer B wrote $5x + 10$.
- They look different, but are they really?
- Let's check: if $x = 4$, Producer A gets $3(4) + 2(4) + 10 = 30$, and Producer B gets $5(4) + 10 = 30$.
- Sort each expression into the group with its equivalent expression.

Think About It

- Why did both formulas give the same answer?
- What did Producer B do differently from Producer A?
- Would they still match if $x = 10$?

My Notes

Guided Examples

Example 1

Which expression is equivalent to 4x + 3x?

Solution: 4x + 3x = 7x. Combine the coefficients: 4 + 3 = 7.

Answer: A. 7x

Example 2

Which expression is equivalent to 2(m + 5)?

Solution: 2(m + 5) = 2m + 10 using the distributive property.

Answer: A. 2m + 10

Example 3

Which property is shown: 3(x + 7) = 3x + 21?

Solution: Multiplying 3 by each term inside the parentheses is the distributive property.

Answer: A. Distributive

Write About the Math

The Writing Revolution

I can explain my work using the words equivalent, simplify, like terms, and combine.

1. Kernel Sentence

subject + verb

Model: Equivalent is expressions that always have the same value.
Equivalente es expresiones que siempre tienen el mismo valor.

Write a kernel sentence about equivalent. Use a subject and a verb.
Escribe una oración base sobre equivalente. Usa un sujeto y un verbo.

2. Sentence Expansion

because · but · so

Kernel: Equivalent matters in math
Equivalente importa en matemáticas

Expand the kernel three ways. Add a reason, a contrast, and a result.

because *porque*

Equivalent matters in math because ____.
Equivalente importa en matemáticas porque ____.

but *pero*

Equivalent matters in math, but ____.
Equivalente importa en matemáticas, pero ____.

so *entonces*

Equivalent matters in math, so ____.
Equivalente importa en matemáticas, entonces ____.

3. Sentence Types

4 ways to write a math idea

Statement
Afirmación

Tell one true fact about equivalent.
Di un hecho verdadero sobre equivalent.

Equivalent ____.

Question
Pregunta

Ask a question about equivalent.
Haz una pregunta sobre equivalent.

How does ____ ?
¿Cómo ____ ?

Exclamation
Exclamación

Show excitement about equivalent.
Muestra entusiasmo sobre equivalent.

Wow, ____ !
¡Guau, ____ !

Command
Mandato

Tell a partner what to do with equivalent.
Dile a un compañero qué hacer con equivalent.

First, ____ .
Primero, ____ .

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4. Explain Your Reasoning

use a sentence starter

These expressions are equal because ____.
Estas expresiones son iguales porque ____.

I checked by ____.
Lo comprobé al ____.

Rewriting helps when ____.
Reescribir ayuda cuando ____.

Try It

Solve on your own. Check the answer key when you are done.

1. Which property is shown: 3(x + 7) = 3x + 21?

A. Distributive

B. Commutative

C. Associative

D. Identity

Show your work:

2. Simplify: 5n + 2n

A. 7n

B. 10n

C. $7n^2$

D. 52n

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

A student says 2x + 3 and 5x are equivalent because both equal 5 when x = 1. Is the student correct? Explain why testing one value is not enough to prove equivalence, and find a value of x where they give different results.

Sentence starter: The student is ____ because ____. When x = 1: 2(1) + 3 = ____ and 5(1) = ____. But when x = ____: 2(____) + 3 = ____ and 5(____) = ____. To prove equivalence, expressions must be equal for ____ values of x.

Show your work:

Reflect — Exit Ticket

Which expression is equivalent to 6n + 4 + 3n − 1?

A. 9n + 3

B. 9n + 5

C. 63n

D. 18n + 4

Your answer:

Answer Key & Teacher Guide

1. **Try It 1:** A. Distributive — *Multiplying 3 by each term inside the parentheses is the distributive property.*
2. **Try It 2:** A. 7n — *5n + 2n = 7n. Add the coefficients: 5 + 2 = 7. The variable stays as n.*
3. **Exit Ticket:** A. 9n + 3 — *6n + 3n = 9n and 4 − 1 = 3, so the simplified expression is 9n + 3.*

Writing (TWR) — what to look for

- **Kernel sentence:** A complete sentence needs a subject and a verb. Example: Equivalent is expressions that always have the same value.
- **Expansion:** *because* gives a reason, *but* shows a contrast or exception, *so* shows a result. Answers vary; each must keep the kernel idea and add the correct kind of detail.
- **Sentence types:** Statement ends with a period, question with "?", exclamation with "!", and a command starts with an action verb (a "bossy" verb).