Unit 4, Lesson 1

Writing Equivalent Equations

Let's write equations in new ways.

1.1 Let Me Count the Ways

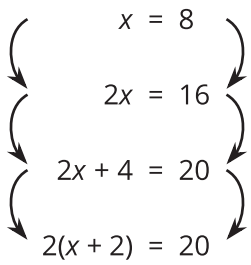
Write as many equivalent expressions for each as you have time.

1. 10

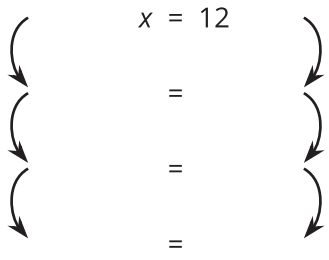
2. $2x$

1.2 What Happens at Each Step?

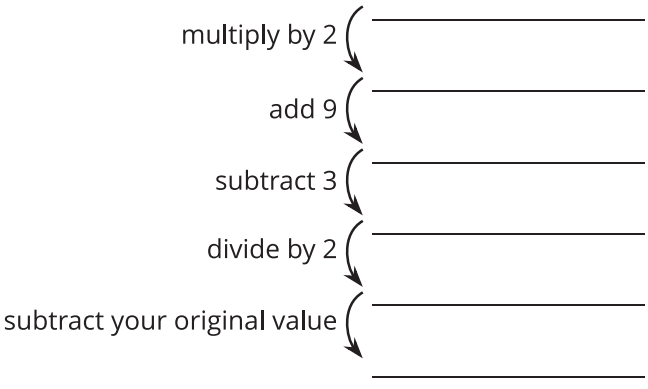
1. Diego writes a sequence of equivalent equations by making one move on each line. Next to each arrow, write what the move is.



2. Write your own sequence of equivalent equations starting from $x = 12$. Use at least 3 different moves and write the moves next to each arrow.



1.3 A Number Puzzle



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Are you ready for more?

Write another number puzzle with at least three steps.

Trade puzzles with a partner and solve theirs. Can you figure out how it works?

Compare your solutions to each puzzle. Did they solve them the same way you did?

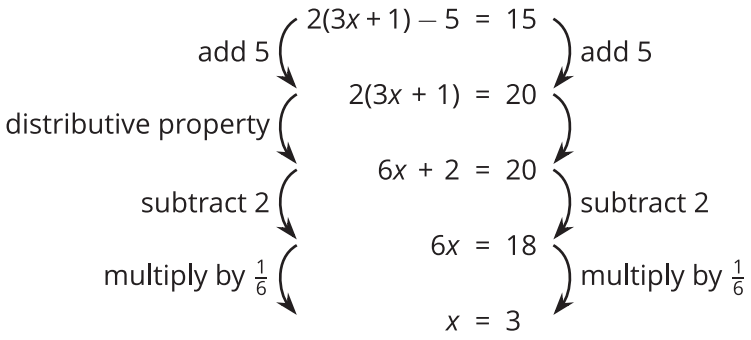
Lesson 1 Summary

Equations are equivalent if values for the variables that make one equation true also make the other equation true. One way to create equivalent equations is to correctly use valid moves.

Valid moves include:

- Using the distributive property. ($2(x + 6)$ is equivalent to $2x + 12$)
- Combining like terms. ($2x + 1 - x + 5$ is equivalent to $x + 6$)
- Adding the same value to each side.
- Subtracting the same value from each side.
- Multiplying each side by the same non-zero value.
- Dividing each side by the same non-zero value.

For example, all of these equations are equivalent:



For these equations, the valid moves are used correctly, so all of the equations are equivalent. The last equation shows that 3 is the value for x that makes the equation true. Because all of the equations are equivalent, 3 is the value for x that makes each of these equations true.

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