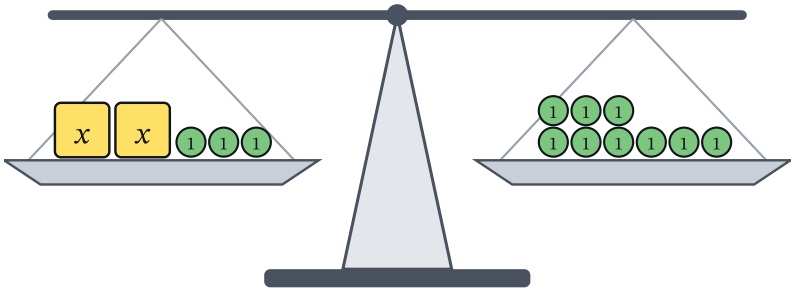
Names (pair) _____ Date _____

Equations and Equivalence



Remember

An **equation** is an equality with an unknown. A **solution** is a number that makes the equality true when we put it in place of the unknown. The scales stay balanced if we add or take away the same amount on both sides, or multiply or divide both sides by the same number other than 0. This gives **equivalent** equations: they have the same solutions.

1 IN PAIRS Write the equation for the scales in the picture. What can you take off both pans? Solve the equation step by step and write what you did next to each step.

$x =$ ☐

2 ON YOUR OWN Is the number a solution of the equation? Check by substituting.

Equation	Number	Left side	Right side	Solution?
$3x - 5 = 7$	4	☐	☐	yes / no
$2(x + 1) = 10$	3	☐	☐	yes / no
$\frac{x}{2} + 1 = 4$	6	☐	☐	yes / no
$5 - x = 8$	-3	☐	☐	yes / no
$4x = 2x + 6$	3	☐	☐	yes / no

Names (pair) _____ Date _____

3 IN PAIRS Which equations are equivalent to $2x + 4 = 10$? Explain which operation gives each equivalent equation.

Equation	Equivalent?	How?
$x + 2 = 5$	**yes** / **no**	
$2x = 6$	**yes** / **no**	
$2x + 8 = 14$	**yes** / **no**	
$4x + 4 = 20$	**yes** / **no**	
$x = 3$	**yes** / **no**	
$2x = 14$	**yes** / **no**	

4 IN PAIRS **Find the mistake** and solve correctly.

Ana: $3x + 2 = 11$, **subtract** $2 \rightarrow 3x = 11$ **true** / **false**

Correction: _____

Ivan: $4x = 12$, **subtract** $4 \rightarrow x = 8$ **true** / **false**

Correction: _____

5 ON YOUR OWN Solve and check.

$x + 7 = 12 \rightarrow x =$ ☐

$3x = -15 \rightarrow x =$ ☐

$\frac{x}{4} = 3 \rightarrow x =$ ☐

$5x - 2 = 18 \rightarrow x =$ ☐

The Balance Scales app · otooly.com/balance-scales

Type $2x + 3 = 9$ and solve it with the buttons that change both sides. Then click just one weight and watch what the scales do.

★ ON YOUR OWN **Exit card.** Is $x = 4$ a solution of $3x - 5 = x + 3$? **yes** / **no**