LESSON MAKER PRO

Equation Endings

Transform equations to reveal what kind of solution they have.

GRADE 8 · 8.EE.C.7a

CCSS.Math.Content.8.EE.C.7a "Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms..."

NAME _____ DATE _____

READ THE FINAL FORM

Use inverse operations to simplify both sides while keeping the equation balanced. If you reach x = a, there is one solution. If the variables cancel and you reach a = a, there are infinitely many solutions. If you reach a = b with different numbers, there is no solution.

WORKED EXAMPLE

$4(x + 3) - 6 = 4x + 6$

1. Distribute: $4x + 12 - 6 = 4x + 6$
2. Combine like terms: $4x + 6 = 4x + 6$
3. Subtract $4x$: $6 = 6$

Answer: Infinitely many solutions.

PRACTICE 6 problems

1 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $2x + 9 = x + 19$

ANSWER _____

2 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $8(x - 2) = 8x - 16$

ANSWER _____

3 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $9x + 5 = 9x + 7$

ANSWER _____

4 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $2(x + 5) - 9 = x + 9$

ANSWER _____

5 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $x/2 + 7 = x/2 + 9$

ANSWER _____

6 Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: $10 - 5(x + 2) = -5x$

ANSWER _____

APPLY IT Show your work

1 Maya has $50 saved and adds $9 each week. Jordan has $85 saved and adds $2 each week. Write and transform an equation to find when they will have the same amount of money. State the type of solution.

WORK SPACE

ANSWER _____

2 For a school dance, one DJ service charges $8 per song plus a $5 booking fee. Another charges $8 per song plus a $9 booking fee. Will the total costs ever be equal? Write and transform an equation, then state the type of solution.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Transform the equation completely. Then explain how the final form proves the number of solutions: $2(5x - 7) + 9 = 10x - 5$

WORK SPACE AND ANSWER

ANSWER KEY

Equation Endings

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: 2x + 9 = x + 19	**2x + 9 = x + 19 -> x + 9 = 19 -> x = 10; one solution.**
2	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: 8(x - 2) = 8x - 16	**8x - 16 = 8x - 16 -> -16 = -16; infinitely many solutions.**
3	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: 9x + 5 = 9x + 7	**9x + 5 = 9x + 7 -> 5 = 7; no solution.**
4	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: 2(x + 5) - 9 = x + 9	**2x + 1 = x + 9 -> x + 1 = 9 -> x = 8; one solution.**
5	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: x/2 + 7 = x/2 + 9	**7 = 9; no solution.**
6	Transform the equation. Then state whether it has one solution, infinitely many solutions, or no solution: 10 - 5(x + 2) = -5x	**10 - 5x - 10 = -5x -> -5x = -5x -> 0 = 0; infinitely many solutions.**

PART 2 · APPLY IT

1. **w = 5 weeks; one solution.** Use 50 + 9w = 85 + 2w. This simplifies to 7w = 35, so w = 5.
2. **No, the costs will never be equal; no solution.** Use 8s + 5 = 8s + 9. Subtracting 8s gives 5 = 9, which is false.

CHALLENGE

Infinitely many solutions; 2(5x - 7) + 9 = 10x - 14 + 9 = 10x - 5, so -5 = -5.

Accept equivalent simplifying steps and equivalent final forms such as 0 = 0 for an identity. For word problems, accept a correct equation, transformation, and solution classification.