

Equation Escape

Simplify, balance, and solve for x.

GRADE 8 • 8.PFA.4

8.PFA.4 "The student will write and solve multistep linear equations in one variable, including problems in context that require the solution of a multistep linear equation in one variable..."

NAME _____

DATE _____

KEEP BOTH SIDES BALANCED

First simplify each side by distributing and combining like terms. Then use the same inverse operation on both sides until x is alone. Check by replacing x with your answer in the original equation.

WORKED EXAMPLE

Solve: $12(x + 1) = 6x + 18$

1. Distribute: $12x + 12 = 6x + 18$
2. Subtract $6x$: $6x + 12 = 18$
3. Subtract 12: $6x = 6$
4. Divide by 6: $x = 1$

Answer: $x = 1$

PRACTICE 6 problems

1 Solve: $4x - 9 = 19$

ANSWER _____

2 Solve: $8x + 5 = 3x + 30$

ANSWER _____

3 Solve: $7(x - 4) = 35$

ANSWER _____

4 Solve: $9x + 14 = 4x - 21$

ANSWER _____

5 Solve: $13x - 9x + 15 = 43$

ANSWER _____

6 Solve: $14(x + 2) = 9x + 55$

ANSWER _____

APPLY IT Show your work

- 1** A game tournament can use Room A for a \$35 fee plus \$4 per player. Room B costs a \$15 fee plus \$9 per player. Write and solve an equation to find how many players make the room costs equal.

WORK SPACE

ANSWER _____

- 2** A robotics team has \$70. It pays a \$14 registration fee and spends \$7 on each sensor. Write and solve an equation to find how many sensors the team can buy.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve and confirm by substitution: $8(4x - 5) + 9 = 7(x + 13) + 3$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $4x - 9 = 19$	$x = 7$
2	Solve: $8x + 5 = 3x + 30$	$x = 5$
3	Solve: $7(x - 4) = 35$	$x = 9$
4	Solve: $9x + 14 = 4x - 21$	$x = -7$
5	Solve: $13x - 9x + 15 = 43$	$x = 7$
6	Solve: $14(x + 2) = 9x + 55$	$x = 27/5$

PART 2 • APPLY IT

- 4 players** Use $35 + 4x = 15 + 9x$. Solving gives $20 = 5x$, so $x = 4$.
- 8 sensors** Use $14 + 7x = 70$. Subtract 14, then divide by 7 to get $x = 8$.

CHALLENGE

$x = 5$; substituting gives $129 = 129$.

Accept equivalent equation forms during students' work. For the last practice problem, accept $x = 27/5$ or $x = 5 \frac{2}{5}$.