

Equation Toolkit

Use inverse operations to solve linear and literal equations.

GRADE 8 • 8.PAR.3.6

8.PAR.3.6 "Use algebraic reasoning to fluently manipulate linear and literal equations expressed in various forms to solve relevant, mathematical problems."

NAME _____

DATE _____

UNDO OPERATIONS

To solve a linear equation, undo operations in reverse order while keeping both sides balanced. Combine like terms or use the distributive property first when needed, then isolate the variable.

WORKED EXAMPLE

Solve: $6x + 11 = 47$

1. Subtract 11 from both sides: $6x = 36$

2. Divide both sides by 6: $x = 6$

Answer: $x = 6$

PRACTICE 6 problems

1 Solve: $4x + 9 = 29$

ANSWER _____

2 Solve: $3(x - 4) = 24$

ANSWER _____

3 Solve: $18 - 2x = 8$

ANSWER _____

4 Solve: $x/5 + 3 = 7$

ANSWER _____

5 Solve: $(2/3)x - 4 = 10$

ANSWER _____

6 Solve for y: $5x + 2y = 30$

ANSWER _____

APPLY IT Show your work

- 1** A music streaming app charges a \$4 sign-up fee and \$3 each month. Your total cost is \$25. How many months did you pay for?

WORK SPACE

ANSWER _____

- 2** An esports club has \$86 to spend on team stickers. Shipping costs \$5, and each sticker pack costs \$9. How many sticker packs can the club buy?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve: $5(2x - 3) + 1 = 3(x + 8)$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve: $4x + 9 = 29$	$x = 5$
2	Solve: $3(x - 4) = 24$	$x = 12$
3	Solve: $18 - 2x = 8$	$x = 5$
4	Solve: $x/5 + 3 = 7$	$x = 20$
5	Solve: $(2/3)x - 4 = 10$	$x = 21$
6	Solve for y: $5x + 2y = 30$	$y = 15 - (5/2)x$

PART 2 • APPLY IT

- 7 months** Write $4 + 3m = 25$. Subtract 4, then divide by 3 to get $m = 7$.
- 9 sticker packs** Write $9p + 5 = 86$. Subtract 5, then divide by 9 to get $p = 9$.

CHALLENGE

$x = 38/7$

Accept equivalent forms for the literal equation, including $2y = 30 - 5x$. For the challenge, accept $x = 5 \frac{3}{7}$ as equivalent to $x = 38/7$.