LESSON MAKER PRO

Solve It Cleanly

Linear equations, inequalities, and variable coefficients

HIGH SCHOOL · AI-A.REI.3

AI-A.REI.3 "Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters."

NAME _____ DATE _____

KEEP BOTH SIDES BALANCED

Use inverse operations to isolate x while keeping both sides of an equation balanced. When you multiply or divide both sides of an inequality by a negative number, reverse the inequality sign.

WORKED EXAMPLE

Solve $7x - 5 = 30$.

1. Add 5 to both sides.
2. $7x = 35$
3. Divide both sides by 7.
4. $x = 5$

Answer: x = 5

PRACTICE 6 problems

1 Solve $6x + 8 = 44$.

ANSWER _____

2 Solve $-3x + 14 = 2$.

ANSWER _____

3 Solve $(2/3)x - 1 = 11$.

ANSWER _____

4 Solve $8(x - 4) = 64$.

ANSWER _____

5 Solve $ax + 16 = 40$ for x, where $a \neq 0$.

ANSWER _____

6 Solve $-9x + 27 \leq 0$.

ANSWER _____

APPLY IT Show your work

1 A music app charges a $13 monthly fee plus $2 for each song download. You can spend no more than $31 this month. Write and solve an inequality to find the greatest number of songs, x, you can download.

WORK SPACE

ANSWER _____

2 You earn $15 per hour editing videos, but you pay $18 for design software. How many hours, x, must you work to have $72 left after paying for the software?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve $b(x - 6) = 4x + 10$ for x. Also state what happens when $b = 4$, and state whether any value of b gives infinitely many solutions.

WORK SPACE AND ANSWER

ANSWER KEY # Solve It Cleanly

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve 6x + 8 = 44.	**x = 6**
2	Solve -3x + 14 = 2.	**x = 4**
3	Solve (2/3)x - 1 = 11.	**x = 18**
4	Solve 8(x - 4) = 64.	**x = 12**
5	Solve ax + 16 = 40 for x, where a ≠ 0.	**x = 24/a**
6	Solve -9x + 27 ≤ 0.	**x ≥ 3**

PART 2 · APPLY IT

1. **9 songs** Write 13 + 2x ≤ 31. Subtract 13, then divide by 2 to get x ≤ 9, so the greatest whole number of songs is 9.
2. **6 hours** Write 15x - 18 = 72. Add 18 and divide by 15 to get x = 6.

CHALLENGE

x = (6b + 10)/(b - 4) for b ≠ 4. When b = 4, there is no solution. No value of b gives infinitely many solutions.

Accept algebraically equivalent forms of x = 24/a and x = (6b + 10)/(b - 4). For the music problem, accept x ≤ 9 if the student also identifies 9 as the greatest whole-number number of songs.