LESSON MAKER PRO

Balance the Bill

Solve equations and inequalities with terms on both sides.

GRADE 8 · 8.EE.7a

8.EE.7a "Extend concepts of linear equations and inequalities in one variable to more complex multi-step equations and inequalities in real-world and mathematical situations..."

NAME _____ DATE _____

KEEP IT BALANCED

Use the Distributive Property, then combine like terms on each side. Add or subtract to move the x-terms to one side. To keep an inequality true, reverse its sign if you multiply or divide both sides by a negative number.

WORKED EXAMPLE

Solve 7/8(x - 16) = 3/8x + 13.

1. Distribute: 7/8x - 14 = 3/8x + 13.
2. Subtract 3/8x: 1/2x - 14 = 13.
3. Add 14: 1/2x = 27.
4. Multiply by 2: x = 54.

Answer: x = 54

PRACTICE 6 problems

1 Solve 3(x - 4) + 5 = 2x + 1.

ANSWER _____

2 Solve 2/3(x + 9) = 1/3x + 8.

ANSWER _____

3 Solve 5 - 2(x + 3) = 3x - 11.

ANSWER _____

4 Solve 3/4(x - 8) + x = 1/4x + 9.

ANSWER _____

5 Solve 2(x + 1) - 3 > x + 5.

ANSWER _____

6 Solve 1/3(x - 9) + 2 <= 2/3x - 4.

ANSWER _____

APPLY IT Show your work

1 Your club is ordering patches for backpacks. Shop A charges $2.50 per patch plus a $9 setup fee. Shop B charges $1.75 per patch plus a $24 setup fee. How many patches make the total costs equal?

WORK SPACE

ANSWER _____

2 Your game-night club has $32 for tickets. There is a $6 booking fee, each ticket costs $2.50, and a coupon takes $4 off the total. What is the greatest number of tickets the club can buy?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve -3/4(2x - 8) + 5 > 1/4(2x + 4) - 1. Move all x-terms to the left first. Explain why the inequality sign changes when you solve for x.

WORK SPACE AND ANSWER

ANSWER KEY

Balance the Bill

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve 3(x - 4) + 5 = 2x + 1.	**x = 8**
2	Solve 2/3(x + 9) = 1/3x + 8.	**x = 6**
3	Solve 5 - 2(x + 3) = 3x - 11.	**x = 2**
4	Solve 3/4(x - 8) + x = 1/4x + 9.	**x = 10**
5	Solve 2(x + 1) - 3 > x + 5.	**x > 6**
6	Solve 1/3(x - 9) + 2 <= 2/3x - 4.	**x >= 9**

PART 2 · APPLY IT

1. **20 patches** Set 2.50x + 9 = 1.75x + 24. Then 0.75x = 15, so x = 20.
2. **12 tickets** Solve 6 + 2.50x - 4 <= 32 to get x <= 12. The club can buy at most 12 whole tickets.

CHALLENGE

x < 11/2. After distributing and combining like terms, -2x + 11 > 0, so -2x > -11. Dividing both sides by -2 reverses the inequality sign.

Accept equivalent forms of the inequality answers, such as 6 < x. In the challenge, accept 5.5 in place of 11/2.