LESSON MAKER PRO

Expand and Solve

Use distribution and like terms to solve equations and inequalities.

HIGH SCHOOL · ATM.EE.26

ATM.EE.26 "Solve linear equations and inequalities with rational number coefficients, including those whose solutions require expanding expressions using the distributive property and collecting like terms."

NAME _____ DATE _____

THE BIG IDEA

Distribute to each term inside parentheses, then combine like terms. Move variable terms to one side and numbers to the other. When you multiply or divide both sides of an inequality by a negative number, reverse the inequality sign.

WORKED EXAMPLE

Solve 5/11(x + 22) - 1/11 x = 13.

1. Distribute: 5/11 x + 10 - 1/11 x = 13
2. Combine like terms: 4/11 x + 10 = 13
3. Subtract 10: 4/11 x = 3
4. Multiply by 11/4: x = 33/4

Answer: x = 33/4

PRACTICE 6 problems

1 Solve 3/4 x - 2 = 7.

ANSWER _____

2 Solve 2/3(x - 6) = 8.

ANSWER _____

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

ANSWER _____

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

ANSWER _____

5 Solve 3/4(x - 8) < 1/2 x + 2.

ANSWER _____

6 Solve -2/3(x + 6) + 1/3 x >= -7.

ANSWER _____

APPLY IT Show your work

1 You have already bought 4 songs this month. Each song costs $0.75, and your music plan has a $7 monthly fee. If you spend $19 total this month, how many more songs, x, can you buy?

WORK SPACE

ANSWER _____

2 A club pays an $18 setup fee to make custom stickers, plus $1.50 per sticker. It sells each sticker for $2.25. What is the least number of stickers, x, the club must sell to make at least $12 profit?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve 1/2(3x - 4) - 2/3(x + 6) <= 1/6(x + 12) + 1. Then explain whether x = 14 is a solution.

WORK SPACE AND ANSWER

ANSWER KEY

Expand and Solve

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve 3/4 x - 2 = 7.	**x = 12**
2	Solve 2/3(x - 6) = 8.	**x = 18**
3	Solve 3/4(x + 8) - 1/4 x = 9.	**x = 6**
4	Solve 2/3(x - 3) + 1/6 x = 4.	**x = 36/5**
5	Solve 3/4(x - 8) < 1/2 x + 2.	**x < 32**
6	Solve -2/3(x + 6) + 1/3 x >= -7.	**x <= 9**

PART 2 · APPLY IT

1. **12 more songs** Write 7 + 3/4(x + 4) = 19. Subtract 7 and solve to get x + 4 = 16, so x = 12.
2. **40 stickers** Write 9/4 x - (18 + 3/2 x) >= 12. This simplifies to 3/4 x >= 30, so x >= 40.

CHALLENGE

x <= 27/2. Since 14 > 27/2, x = 14 is not a solution.

Accept equivalent fractions or decimals for equation solutions. Inequality answers must have the correct direction, and the sticker count must be a whole number.