LESSON MAKER PRO

# Keep It Equal

*Solve equations and use them to make sense of costs.*

**GRADE 7 · 7.AT.C.8**

**7.AT.C.8** "Use variables to represent quantities and write and solve equations to model and reason about relationships in context. Write equations of the form px + q = r and p(x + q) = r where p, q, and r are specific rational numbers..."

NAME _____ DATE _____

## THE BIG IDEA

An equation says that two expressions have the same value. To keep them equal, do the same operation to both sides. For px + q = r, subtract q first. For p(x + q) = r, divide by p first.

## WORKED EXAMPLE

Solve $4/5(x + 3/8) = 9/10$.

1. Divide both sides by 4/5: x + 3/8 = 9/8.
2. Subtract 3/8 from both sides: x = 6/8.
3. Simplify: x = 3/4.

**Answer: x = 3/4**

## PRACTICE 6 problems

**1** Solve 3x + 7 = 22.

**ANSWER** _____

**2** Solve 2(x + 5) = 18.

**ANSWER** _____

**3** Solve 2/5x + 1/2 = 17/10.

**ANSWER** _____

**4** Solve 5(x - 2/5) = 18. Show your first step.

**ANSWER** _____

**5** Solve -2x + 3/2 = 15/2.

**ANSWER** _____

**6** Solve -2/3(x + 3/2) = 4/3. Explain how your steps keep both sides equal.

**ANSWER** _____

## APPLY IT Show your work

**1** Each pack of photo stickers costs $1.50, and a one-time design fee is $2. You spend $17. Let x be the number of packs. Write an equation, solve it, and say what your answer means.

WORK SPACE

**ANSWER** _____

**2** Three friends each buy a $2 snack and a ticket to the school dance. Together, they spend $24. Let x be the price of one ticket. Write an equation, solve it, and say what your answer means.

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

A student solves 2(x + 3/2) = 11 by writing 2x + 3/2 = 11 and getting x = 19/4. Find the error. Solve the original equation and explain how your steps keep it equal.

WORK SPACE AND ANSWER

ANSWER KEY

# Keep It Equal

GRADE 7 · 7.AT.C.8

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Solve 3x + 7 = 22. | **x = 5** |
| 2 | Solve 2(x + 5) = 18. | **x = 4** |
| 3 | Solve 2/5x + 1/2 = 17/10. | **x = 3** |
| 4 | Solve 5(x - 2/5) = 18. Show your first step. | **Divide both sides by 5: x - 2/5 = 18/5. Then x = 4.** |
| 5 | Solve -2x + 3/2 = 15/2. | **x = -3** |
| 6 | Solve -2/3(x + 3/2) = 4/3. Explain how your steps keep both sides equal. | **Divide both sides by -2/3 to get x + 3/2 = -2. Subtract 3/2 from both sides to get x = -7/2.** |

## PART 2 · APPLY IT

1. **1.50x + 2 = 17; x = 10 packs** Subtract 2 from both sides, then divide by 1.50. The purchase includes 10 packs of stickers.
2. **3(x + 2) = 24; x = $6 per ticket** Divide both sides by 3, then subtract 2. Each dance ticket costs $6.

## CHALLENGE

**The student multiplied x by 2 but did not multiply 3/2 by 2. Divide both sides of the original equation by 2 to get x + 3/2 = 11/2. Subtract 3/2 from both sides to get x = 4. Doing the same operation to both sides keeps them equal.**

Accept equivalent equations and correct solution methods. For explanations, look for operations applied to both sides of the equation.