Apply Properties of Equality: Add and Subtract

TOPIC 4 / MATHEMATICS

Write. Represent. Explain.

45-minute lesson • Original classroom examples

What will we learn today?

- Keep equations balanced by performing the same operation on both sides.
- Use an equation, inequality, table, or diagram to justify your reasoning.
- Explain your answer using mathematical vocabulary and units.

5-minute warm-up

Discuss with a partner: What previous algebra or number skill will help with today’s lesson?

Show one calculation or example in your notebook.

Why this lesson matters

A gift card has $16 added to an unknown balance and now holds $43.

What is known? What is unknown? Which quantities are related?

Represent the relationship

A gift card has $16 added to an unknown balance and now holds $43.

$$b + 16 = 43$$

Explain the meaning of the variable, numbers, and operations.

Worked example

Solve b + 16 = 43. Show the balanced step.

$$b + 16 - 16 = 43 - 16 \Rightarrow b = 27$$

Check: Does the result match the original relationship?

Independent practice

1. Solve $q - 14 = 29$.

2. Solve $z + 8.5 = 21$.

Check your reasoning

Question 1

$$q = 29 + 14 = 43$$

Question 2

$$z = 21 - 8.5 = 12.5$$

Group challenge

A student subtracts 12 only on the left of x + 12 = 38. Explain the mistake.

Each group member must explain one step or defend one claim.

Group challenge • solution

$$x + 12 - 12 = 38 - 12 \Rightarrow x = 26$$

Compare methods. Does the answer make sense in context?

Additional Practice — If Time Allows

Explain b + 16 = 43. Show the balanced step.

Extension: Create a similar problem with different numbers.

2-minute exit ticket

Solve $a - 7.5 = 18.5$.

Work independently. Show enough steps to explain your thinking.

Exit ticket • answer

$$a = 26$$

Reflect: What would you check before moving to the next lesson?