Understand Equations and Solutions

TOPIC 4 / MATHEMATICS

Write. Represent. Explain.

45-minute lesson • Original classroom examples

What will we learn today?

- Test an unknown value by substitution.
- 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 game token balance started at 28. After spending 9 tokens, how many remain?

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

Represent the relationship

A game token balance started at 28. After spending 9 tokens, how many remain?

$$x + 9 = 28$$

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

Worked example

For x + 9 = 28, test x = 17 and x = 19.

$$19 + 9 = 28 \quad \checkmark$$

Check: Does the result match the original relationship?

Independent practice

1. Does n = 6 satisfy 4n − 3 = 21?

2. Is m = 5 a solution of 3m + 7 = 25?

Check your reasoning

Question 1

$$4(6) - 3 = 21$$

Question 2

$$3(5) + 7 = 22 \neq 25$$

Group challenge

A teammate says 8 solves 5p − 4 = 36. Prove or refute using substitution.

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

Group challenge • solution

$$5(8) - 4 = 36 \quad \checkmark$$

Compare methods. Does the answer make sense in context?

Additional Practice — If Time Allows

Is m = 5 a solution of 3m + 7 = 25?

Extension: Create a similar problem with different numbers.

2-minute exit ticket

Does $y = 4$ make $7y - 2 = 25$ true?

Work independently. Show enough steps to explain your thinking.

Exit ticket • answer

$$7(4) - 2 = 26 \neq 25$$

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