LESSON MAKER PRO

Spot the Structure

Choose a smart first move, then solve.

HIGH SCHOOL · GDA.AF.A

GDA.AF.A "The structure of an equation or inequality (including, but not limited to, one-variable linear and quadratic equations, inequalities, and systems of linear equations in two variables) can be purposefully analyzed (with and without..."

NAME _____ DATE _____

LOOK BEFORE YOU SOLVE

The form of an equation can point you to an efficient method. If a product equals 0, set each factor equal to 0. If a square equals a number, consider both square roots. In a system, look for a variable that is easy to eliminate or substitute.

WORKED EXAMPLE

Solve $(x - 7)(x + 11) = 0$.

1. The left side is a product equal to 0, so set each factor equal to 0.
2. $x - 7 = 0$ or $x + 11 = 0$.
3. $x = 7$ or $x = -11$.

Answer: x = 7 or x = -11

PRACTICE 6 problems

1 Solve $(x - 4)(x + 6) = 0$. Name your first move.

ANSWER _____

2 Solve $x^2 = 81$. Name your first move.

ANSWER _____

3 Solve $x^2 - 3x - 10 = 0$. Name your first move.

ANSWER _____

4 Solve $4(x - 3) = 20$. Name your first move.

ANSWER _____

5 Solve the system $x + y = 10$ and $x - y = 2$. Name your first move.

ANSWER _____

6 Solve the system $2x + y = 9$ and $y = x + 3$. Name your first move.

ANSWER _____

APPLY IT Show your work

1 A school club is making a rectangular photo backdrop with an area of 48 square feet. Its length is 2 feet more than its width. Find both dimensions. Choose an efficient method and show why your answer works.

WORK SPACE

ANSWER _____

2 At a school game, two student tickets and one adult ticket cost $26. One student ticket and one adult ticket cost $18. Find each ticket price. Choose an efficient method and show why your answer works.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve $x^2 - 12x + 36 = 4$. Explain how the equation's structure gives you an efficient method, and check both solutions.

WORK SPACE AND ANSWER

Spot the Structure

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve (x - 4)(x + 6) = 0. Name your first move.	**Set each factor equal to 0; x = 4 or x = -6.**
2	Solve $x^2 = 81$. Name your first move.	**Take both square roots; x = 9 or x = -9.**
3	Solve $x^2 - 3x - 10 = 0$. Name your first move.	**Factor as (x - 5)(x + 2) = 0; x = 5 or x = -2.**
4	Solve 4(x - 3) = 20. Name your first move.	**Divide both sides by 4; x = 8.**
5	Solve the system x + y = 10 and x - y = 2. Name your first move.	**Add the equations to eliminate y; x = 6, y = 4.**
6	Solve the system 2x + y = 9 and y = x + 3. Name your first move.	**Substitute x + 3 for y; x = 2, y = 5.**

PART 2 · APPLY IT

1. **Width: 6 feet. Length: 8 feet.** Let x be the width. Factor x(x + 2) = 48 as (x + 8)(x - 6) = 0, then use the positive solution x = 6; 6 × 8 = 48.
2. **Student ticket: $8. Adult ticket: $10.** Subtract the second total from the first to find the student price, $8. The adult price is $18 - $8 = $10, and 2($8) + $10 = $26.

CHALLENGE

The left side is $(x - 6)^2$, so $(x - 6)^2 = 4$ gives x - 6 = 2 or x - 6 = -2. Thus x = 8 or x = 4. Check: $(8 - 6)^2 = 4$ and $(4 - 6)^2 = 4$.

Accept equivalent valid first moves and either order for paired solutions. For the backdrop, reject the negative width because a physical dimension must be positive.