LESSON MAKER PRO

Spot the Structure

Choose an efficient way to solve each equation.

HIGH SCHOOL · A1P.AF.C

A1P.AF.C "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** _____

CHOOSE YOUR MOVE

Look at an equation's form before you solve it. If a product equals 0, set each factor equal to 0. If a squared expression equals a positive number, use both its positive and negative square roots.

WORKED EXAMPLE

Solve $(x - 13)(x + 12) = 0$.

1. Set each factor equal to 0: $x - 13 = 0$ or $x + 12 = 0$.
2. Solve each equation: $x = 13$ or $x = -12$.
3. Each value makes one factor 0, so each makes the product 0.

Answer: x = 13 or x = -12

PRACTICE 6 problems

1 Solve $x(x - 5) = 0$.

ANSWER _____

2 Solve $x^2 = 49$.

ANSWER _____

3 Solve $x^2 + 9x + 20 = 0$.

ANSWER _____

4 Solve $x^2 - 36 = 0$.

ANSWER _____

5 Solve $2x^2 - 16x = 0$.

ANSWER _____

6 Solve $x^2 + 6x + 9 = 0$.

ANSWER _____

APPLY IT Show your work

1 You are designing a rectangular sticker for a laptop. Its length is 3 inches more than its width, and its area is 40 square inches. Find its width and length.

WORK SPACE

ANSWER _____

2 For a school gaming event, a club estimates it will sell 30 - x tickets if each ticket costs x dollars. What ticket prices would bring in $200?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student divides both sides of $x^2 = 11x$ by x and gets x = 11. Explain why this can miss a solution. Then find and check every solution in the original equation.

WORK SPACE AND ANSWER

Spot the Structure

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x(x - 5) = 0$.	**$x = 0$ or $x = 5$**
2	Solve $x^2 = 49$.	**$x = -7$ or $x = 7$**
3	Solve $x^2 + 9x + 20 = 0$.	**$x = -5$ or $x = -4$**
4	Solve $x^2 - 36 = 0$.	**$x = -6$ or $x = 6$**
5	Solve $2x^2 - 16x = 0$.	**$x = 0$ or $x = 8$**
6	Solve $x^2 + 6x + 9 = 0$.	**$x = -3$**

PART 2 · APPLY IT

1. **Width: 5 inches; length: 8 inches.** Let the width be x. Solve $x(x + 3) = 40$ by factoring $(x + 8)(x - 5) = 0$; reject -8 because a width must be positive.
2. **$10 or $20 per ticket.** Solve $x(30 - x) = 200$, which gives $(x - 10)(x - 20) = 0$. Both prices produce positive ticket sales and $200 in revenue.

CHALLENGE

Dividing by x rules out $x = 0$. Factoring gives $x(x - 11) = 0$, so $x = 0$ or $x = 11$. Both check: $0^2 = 11(0) = 0$, and $11^2 = 11(11) = 121$.

Accept solutions in either order. For the sticker problem, students must reject the negative width; for the challenge, they must explain the lost zero solution and check both values.