LESSON MAKER PRO

Spot the Structure

Choose a strategy, solve, and check.

HIGH SCHOOL · A2S.AF.C

A2S.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 zero, set each factor equal to zero. If a squared expression equals a positive number, use both its positive and negative square roots, then check your solutions.

WORKED EXAMPLE

Solve $(x - 15)^2 = 64$.

1. Take both square roots: $x - 15 = 8$ or $x - 15 = -8$.
2. Add 15: $x = 23$ or $x = 7$.
3. Check: $(23 - 15)^2 = 64$ and $(7 - 15)^2 = 64$.

Answer: x = 7 or x = 23

PRACTICE 6 problems

1 Solve $x^2 - 9 = 0$.

ANSWER _____

2 Solve $x^2 + 6x = 0$. State why both solutions work.

ANSWER _____

3 Solve $(x - 5)(x + 3) = 0$.

ANSWER _____

4 Solve $x^2 - 10x + 25 = 0$. Explain why there is only one solution.

ANSWER _____

5 Solve $x^2 + x - 12 = 0$.

ANSWER _____

6 Solve $(x + 1)^2 = 16$.

ANSWER _____

APPLY IT Show your work

1 At a school movie night, the club sells 48 - 3x tickets when each ticket costs x dollars. The club wants $180 in ticket sales. What ticket prices would give this revenue?

WORK SPACE

ANSWER _____

2 A club designs a rectangular photo wall for a school dance. Its length is 2 feet more than its width, and its area is 120 square feet. Let x be the width in feet. What are the wall's dimensions?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve $x^2 - x - 20 \leq 0$. Explain why your solution includes every value between the zeros, including the zeros.

WORK SPACE AND ANSWER

Spot the Structure

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 - 9 = 0$.	**x = -3 or x = 3**
2	Solve $x^2 + 6x = 0$. State why both solutions work.	**x = 0 or x = -6. Since x(x + 6) = 0, either factor can be zero.**
3	Solve $(x - 5)(x + 3) = 0$.	**x = 5 or x = -3**
4	Solve $x^2 - 10x + 25 = 0$. Explain why there is only one solution.	**x = 5. The left side is $(x - 5)^2$, which equals zero only when x = 5.**
5	Solve $x^2 + x - 12 = 0$.	**x = 3 or x = -4**
6	Solve $(x + 1)^2 = 16$.	**x = 3 or x = -5**

PART 2 · APPLY IT

1. **$6 or $10 per ticket** Set x(48 - 3x) = 180 and simplify to (x - 6)(x - 10) = 0. Both prices give $180: 6(30) = 180 and 10(18) = 180.
2. **10 feet wide and 12 feet long** Solve x(x + 2) = 120 by factoring (x + 12)(x - 10) = 0. Reject x = -12 because a width cannot be negative.

CHALLENGE

-4 ≤ x ≤ 5. Factor to get (x - 5)(x + 4) ≤ 0. Between -4 and 5, one factor is negative and the other is positive, so their product is negative. At the zeros, the product is zero.

Accept solutions in either order. For the challenge, accept interval notation [-4, 5] and any correct sign-based explanation.