LESSON MAKER PRO

Equation Reality Check

Solve, check, and catch extraneous solutions.

HIGH SCHOOL · HSA-REI.A.2

CCSS.Math.Content.HSA-REI.A.2 "Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise."

NAME _____ DATE _____

SOLVE, THEN CHECK

For a radical equation, isolate the square root, square both sides, and check every result in the original equation. For a rational equation, note values that make a denominator zero, then clear denominators and check that your solution is allowed.

WORKED EXAMPLE

Solve sqrt(x + 17) = 8.

1. Square both sides: x + 17 = 64.
2. Subtract 17: x = 47.
3. Check: sqrt(47 + 17) = 8.

Answer: x = 47

PRACTICE 6 problems

1 1. Solve sqrt(x + 3) = 4.

ANSWER _____

2 2. Solve sqrt(2x - 1) = 7.

ANSWER _____

3 3. Solve sqrt(x + 2) = x - 4.

ANSWER _____

4 4. Solve 4/(x + 2) = 1.

ANSWER _____

5 5. Solve (x + 1)/(x - 3) = 2.

ANSWER _____

6 6. Solve 5/(x - 4) = 2/(x + 1).

ANSWER _____

APPLY IT Show your work

1 The drama club is making a square photo backdrop. Its area is x + 19 square feet, and each side is 9 feet long. Solve sqrt(x + 19) = 9 to find x.

WORK SPACE

ANSWER _____

2 A student media club has a $70 budget for identical headphone adapters after paying a $4 delivery fee. Each adapter costs $11. The equation (70 - 4)/x = 11 models the number of adapters, x. How many adapters can the club buy?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve sqrt(x + 5) = x - 1. In one sentence, explain why any rejected value fails.

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_____

ANSWER KEY

Equation Reality Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	1. Solve sqrt(x + 3) = 4.	**x = 13**
2	2. Solve sqrt(2x - 1) = 7.	**x = 25**
3	3. Solve sqrt(x + 2) = x - 4.	**x = 7; x = 2 is extraneous.**
4	4. Solve 4/(x + 2) = 1.	**x = 2**
5	5. Solve (x + 1)/(x - 3) = 2.	**x = 7**
6	6. Solve 5/(x - 4) = 2/(x + 1).	**x = -13/3**

PART 2 · APPLY IT

1. **x = 62** Square both sides to get x + 19 = 81. Subtract 19, so x = 62.
2. **x = 6 adapters** Subtract the delivery fee to get 66 dollars for adapters, then solve 66/x = 11. This gives x = 6.

CHALLENGE

x = 4; x = -1 is extraneous because it makes the right side negative while the square root is nonnegative.

Accept equivalent solution notation, including solution sets. Require students to reject values that fail the original radical equation or make a rational denominator equal to zero.