LESSON MAKER PRO

Radical Reality Check

Solve radical equations, then test every answer.

HIGH SCHOOL · MA.912.AR.7.1

MA.912.AR.7.1 "Solve one-variable radical equations. Interpret solutions as viable in terms of context and identify any extraneous solutions."

NAME _____ DATE _____

SQUARE, THEN CHECK

Isolate the radical expression before you square both sides of an equation. Squaring can create an answer that does not work in the original equation, so substitute every candidate back to check it.

WORKED EXAMPLE

Solve sqrt(x + 11) = 9.

1. Square both sides: x + 11 = 81.
2. Subtract 11: x = 70.
3. Check: sqrt(70 + 11) = 9, so the solution works.

Answer: x = 70

PRACTICE 6 problems

1 Solve sqrt(x + 4) = 5.

ANSWER _____

2 Solve sqrt(3x - 1) = 2.

ANSWER _____

3 Solve sqrt(x - 7) + 1 = 4.

ANSWER _____

4 Solve sqrt(2x + 3) = x. Identify any extraneous solution.

ANSWER _____

5 Solve sqrt(x + 1) = x - 1. Identify any extraneous solution.

ANSWER _____

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

ANSWER _____

APPLY IT Show your work

1 A drone club uses d = sqrt(4t + 1) to estimate a drone's distance d, in meters, from a marked point t seconds after takeoff. When the distance is 7 meters, find t. Is your answer viable?

WORK SPACE

ANSWER _____

2 A music app tests an audio effect with the equation sqrt(m + 5) = m - 1, where m is the number of minutes after the test begins. Find m and identify any extraneous solution.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve sqrt(x + 6) + sqrt(x - 1) = 7. Explain why there is no other solution.

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ANSWER KEY

Radical Reality Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve sqrt(x + 4) = 5.	**x = 21**
2	Solve sqrt(3x - 1) = 2.	**x = 5/3**
3	Solve sqrt(x - 7) + 1 = 4.	**x = 16**
4	Solve sqrt(2x + 3) = x. Identify any extraneous solution.	**x = 3; x = -1 is extraneous.**
5	Solve sqrt(x + 1) = x - 1. Identify any extraneous solution.	**x = 3; x = 0 is extraneous.**
6	Solve sqrt(5x - 4) = x + 2.	**No real solution.**

PART 2 · APPLY IT

1. **t = 12 seconds; it is viable because time after takeoff can be positive.** Substitute 7 for d to get sqrt(4t + 1) = 7, then square both sides. Solving gives t = 12, which fits the time context.
2. **m = 4 minutes; m = -1 is extraneous.** Square both sides to get m^2 - 3m - 4 = 0, so the candidates are 4 and -1. Only 4 works in the original equation and represents a possible time.

CHALLENGE

x = 10. For x >= 1, both square-root terms increase as x increases, so their sum can equal 7 only once.

Accept equivalent forms such as 5/3. Require students to check candidates in the original equation and to label rejected candidates as extraneous.