Topic 5.4 Solving Radical Equations

Essential Question:

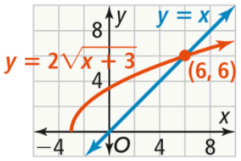
How can you solve equations that include radicals or ratioanl exponents?

Explore and Reason

Complete online.

CONCEPT Summary

Solving Radical Equations

	WORDS	ALGEBRA	GRAPH
Step 1	Isolate the radical term.	$2\sqrt{x+3} - x = 0$ $2\sqrt{x+3} = x$	
Step 2	Square both sides to remove the radical.	$(2\sqrt{x+3})^2 = (x)^2$	
Step 3	Solve the equation.	$4(x+3) = x^2$ $x^2 - 4x - 12 = 0$ $(x-6)(x+2) = 0$ $x = 6$ or $x = -2$	
Step 4	Eliminate extraneous solutions.	$2\sqrt{6+3} - 6 = 0$ $\quad 2\sqrt{-2+3} - (-2) = 0$ $\sqrt{9} = 6$ $\quad 2\sqrt{1} = -2$ $6 \stackrel{?}{=} 6$ $\quad 2 \stackrel{?}{=} -2$ $6 = 6$ ✓ $\quad 2 \neq -2$ ✗	

Q: What are two methods you can use to check for extraneous solutions?

Notes:

Examples & Questions

Examples 1

Q: What does it mean to *isolate the radical*?
Q: How do you eliminate the square root or cube root? Why do you want to eliminate them?

Examples 2

Q: Why is the equation solved for *y*?
Q: Why are parentheses placed around 0.010583x in the third step?

Examples 3

Part A:
Q: Why can you find potential solutions to an equation that are not actual solutions of the original equation?

Part B:
Q: When solving an equation, what indicates that there may be an extraneous solution?

Examples 4

Part A:
Q: Why do you raise each side of an equation to the reciprocal power?

Part B:
Q: Why did the right side of the equation change from $(x-2)^3$ to $(x-2)^2$?

Examples 5

Q: What is another strategy you could use to find the solution to an equation without doing calculation?
Q: Why does a radical remain in the solution steps after the two sides of the equation have been squared the first time?

Examples 6

Q: Why is the inequality written as < 1.9?
Q: How do the steps to solve the problem change if you are given the height instead of the mass?

Practice and Problem Solving

Complete MathXL for School: Practice and Problem Solving (online)
Complete MathXL for School: Enrichment (online)

Challenge: #19, 41 – key will be posted in Power School Learning.

Lesson Quiz 5.4