

Section 6-5 Solving Square root and Other Radical Equations

Learning Goal: To understand how to solve square root and other radical equations.

Essential Questions: How can you simplify the n th root of an expression that contains an n th root as a factor?

When you square each side of an equation, is the resulting equation equivalent to the original?

How are function and its inverse function related?

Warm Up:

Simplify:

1. $\sqrt{36x^2}$

2. $\sqrt[4]{32m^7n^9}$

3. $6\sqrt{4x^2} \cdot 2\sqrt{9x^2y^2}$

4. $\frac{\sqrt[3]{64x^9y^3}}{\sqrt[3]{8x^3}}$

5. $\sqrt{48} - 3\sqrt{27} + 2\sqrt{75}$

6. $\sqrt[4]{7} - \sqrt[3]{7}$

7. $\left(16x^{\frac{1}{4}}y^{\frac{3}{4}}\right)^{-4}$

Vocabulary:

Radical Equation – an equation that has a variable in a radicand or a variable with a rational exponent.

Note: sometimes to solve a square root equation it might require you to square each side of the equation. This may introduce **extraneous solutions (a false statement)**.

Steps to solve a radical equation:

1. Isolate the radical on one side of the equation
2. Raise each side to the power suggested by the index.
3. Check your solution in the original equation for extraneous solutions

Example: What is the solution of $3 + \sqrt{2x - 3} = 8$?

You Try:

1. $\sqrt{4x+1} - 5 = 0$

2. $\sqrt{x+4} + 6 = 7$

3. $3(x+1)^{\frac{2}{3}} = 12$

4. $3\sqrt[5]{(x+1)^3} + 1 = 25$

5. $2(x+3)^{\frac{2}{3}} = 8$

6. $(6x+9)^{\frac{1}{3}} - 5 = -2$

7. $\sqrt{x+7} - 5 = x$

8. $\sqrt{5x-1} + 3 = x$

9. $\sqrt{5x+14} = x$

10. $2 + \sqrt{x-6} = \sqrt{x+10}$

11. $\sqrt{2x+1} - \sqrt{x} = 1$

12. $\sqrt{5x+4} - \sqrt{x} = 4$

Closure: What are the steps to solving a radical equation?

Assignment: section 6.5 # 9,11,17,26,28,30,32,33,35,37,41,43,65 (13 problems)