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| *Solving Radical Equations*  **Handout- KEY** | **Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**  **Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**Objective: To study how to solve radical equations.**

**Segment 1**: Solving Radical Equations Containing One Radical.

An equation containing radical or rational exponents is referred to as radical equation.

Here is an example: 

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| How to Solve Radical Equations   * To solve radical equations, remember a few key things.  1. Just like with any equation, our goal is find the value(s) of the variable that makes the equation true. 2. The key to solving equations containing radicals is:  * Isolate the radical * Raise each side of the equation to the power of the index.  |  | | --- | | Power Property of Equality  If then |   Using the power property of equality, the equation can be solved using standard procedures.   1. Check you answer. When solving radical equations, apparent solutions that are not solutions to the original equation can creep in. These solutions are called extraneous solutions. |

Note: When working with radical equations that contain square roots,  ...

* You must square sides, not the terms: Consider:

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| http://www.regentsprep.org/Regents/math/algtrig/ATE10/radles1.gif | | | BUT ... | | http://www.regentsprep.org/Regents/math/algtrig/ATE10/radles2.gif | |
| * **You must check your answers.** The process of squaring the sides of an equation creates a "derived" equation which may not be equivalent to the original radical equation.  Consequently, solving this new derived equation may *create* solutions that never previously existed.  These "*extra*" roots that are not true solutions of the original radical equation are called extraneous roots and are rejected as answers.  Consider: | | | | | | | |
|  | |  | | --- | | The first statement is false, but when each side is squared, the concluding statement is true. http://www.regentsprep.org/Regents/math/algtrig/ATE10/radles3.gif | |  | | |  | | --- | | The first statement is false, but when each side is squared, the concluding statement is true. http://www.regentsprep.org/Regents/math/algtrig/ATE10/radles4.gif | | |

Example 1: Solve the following equation and check your answer.



* Isolate the radical \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Raise both sides to the power of the index \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Solve the equation \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Checking the solution to Example 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Example 2: Solve the following equations and check your answers.

(a) 

(b)  Answer: x=5

(c)  Answer: no solution

(d)  Answer: x = 15/2

**Segment 2**: Solving Radical Equations Containing Two Radical.

* Isolate one of the radicals; raise both sides of the equation to the power of the index.
* If the radical remains in the equations, then follow the step for solving radical equations from the first segment.

Example 3: Solve the following equations and check your answers.

(a)  Answer: x = 9

(b)  Answer: No solution

(c)  Answer: x = 2