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| |  | | --- | | **Addition and Subtraction of Radicals** | |

(For this lesson, the term "radical" will refer only to "square root".)

When adding or subtracting radicals, you must use the same concept as that of adding or subtracting "like" variables.   
 **In other words, the radicals must be the same  
before you add (or subtract) them.**

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| http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu4.gif | Since the radicals are the same, simply add the numbers **in front** of the radicals (do **NOT** add the numbers under the radicals).  http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu5.gif |
| http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu6.gif | Since the radicals are not the same, and both are in their simplest form, there is no way to combine these values.  The answer is the same as the problem. http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu7.gif  **Warning:** If the radicals in your problem are different, be sure to check to see if the radicals **can**be simplified.  Often times, when the radicals are simplified, they become the same radical and can then be added or subtracted.  Always simplify, if possible, before deciding upon your answer. |

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| **Example 1:** | http://www.regentsprep.org/regents/math/algebra/ao1/radioguy2.gif |

http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu22.gif

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| 1.  Are the radicals the same? | **Answer:** | **NO** |
| 2.  Can we simplify either radical? | **Answer:** | **Yes,**http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu23.gif can be simplified. |
| 3.  Simplify the radical. | **Answer:** | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu24.gifhttp://www.regentsprep.org/regents/math/algebra/ao1/Laddsu25.gif |
| 4.  Now, the radicals are the same       and we can add. | **Answer:** | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu26.gif |

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| **Example 2:** | http://www.regentsprep.org/regents/math/algebra/ao1/radioguy.gif |

http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu35.gif

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| 1. Simplify | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu28.gif | **Answer:** | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu29.gif | |
| 2. Simplify | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu30.gif | **Answer:** | http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu31.gif | |
| 3. Since the radicals in steps 1 and 2 are      now the same, we can combine them. | | | | **Answer:**  http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu32.gif |
| 4. After combining, you are left with: | | | | **Answer:** http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu33.gif |
| 5. Can you combine these radicals? | | | | **Answer:**  **NO** |
| 6. Therefore, | | **Answer:**http://www.regentsprep.org/regents/math/algebra/ao1/Laddsu34.gif | | |