**Algebra I Support**

**Notes: Simplifying Radicals with Variables** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Warm-Up: Simplify.

1.  2.  3.  4. 

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Reminder - when trying to evaluate , one asks the question, "What positive number times itself equals 25?" Of course, the answer is 5.

Consider . To simplify, ask yourself, "What variable quantity times itself equals ?" If necessary, look at the questions above.

Therefore, what is ?

Use this same thought process and the answers above to simplify the following:

5.  6.  7.  8. 

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For Questions 5-8, examine the ***exponents*** of the radicands in the question. Then, look at the ***exponents***of the answers. In your own words, state any pattern that you notice.

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Another relationship among Questions 5-8 is that all of the exponents in the radicands are **even**.

When the exponents are odd, we have to do something slightly different.

Consider  .

Let's use the pattern established above and divide the exponent (7) by 2. How many times does 2 go into 7? What is the remainder?

Therefore, the resulting expression is .

As you can see, when the exponent in the radicand is **odd**, there will be one variable that remains in the radicand.

Simplify. If there are two variables in the radicand, deal with each one separately.

9.  10.  11.  12. 

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Occasionally, positive numbers appear with variables in the radicands. If this happens, just deal with the positive number by using the rules taught yesterday, and then deal with the variables.

13.  14.  15. 

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**Practice Problems:**

Simplify completely. Show all work and check answers below!

1.  2.  3.  4. 

5.  6.  7.  8. 

9.  10.  11.  12. 

13.  14. 

15.  16. 

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1. *d* 2.  3.  4.  5. 

6.  7.  8.  9.  10. 

11.  12.  13.  14.  15.  16. 