Algebra 1
Unit 1, Lesson 3: Simplifying Radicals
NOTES

Name_____ Block_____ Date_____

Essential Question: How do I simplify radical numbers?

I. Finding the Square Root(s) of a Number

Vocabulary:

<table>
<tr><td>Square Root</td><td>Radicand/Index/Radical</td></tr>
<tr><td>Perfect Square
<table><tr><td>1^{2} =</td><td>2^{2} =</td><td>3^{2} =</td></tr><tr><td>4^{2} =</td><td>5^{2} =</td><td>6^{2} =</td></tr><tr><td>7^{2} =</td><td>8^{2} =</td><td>9^{2} =</td></tr><tr><td>10^{2} =</td><td>11^{2} =</td><td>12^{2} =</td></tr></table></td><td>Irrational Number</td></tr>
</table>

Example: Evaluate the expression.

1) $\sqrt{36}$ 2) $-\sqrt{9}$ 3) $\sqrt{81}$ 4) $-\sqrt{49}$

Example: Sometimes the radicand is not a perfect square. This is an irrational number. You could either use your calculator for a decimal approximation or use your perfect squares chart for an approximation.

1) $\sqrt{32}$ 2) $\sqrt{103}$ 3) $-\sqrt{48}$ 4) $\sqrt{23}$

How can I simplify a square root that's not a perfect square?

Method 1 – Prime Factorization	Method 2 – find factors that are perfect squares

Examples: Simplify each square root.

1) $\sqrt{72}$ 2) $\sqrt{20}$ 3) $\sqrt{300}$ 4) $\sqrt{90}$

Let's think about radicals that aren't square roots. How about cube roots? Radicals with an index of 4? 5? Can we use the same methods that we just used? If not, how can we amend them?

Examples: Simplify each radical.

1) $\sqrt[3]{80}$ 2) $\sqrt[3]{54}$ 3) $\sqrt[4]{48}$ 4) $\sqrt[4]{162}$