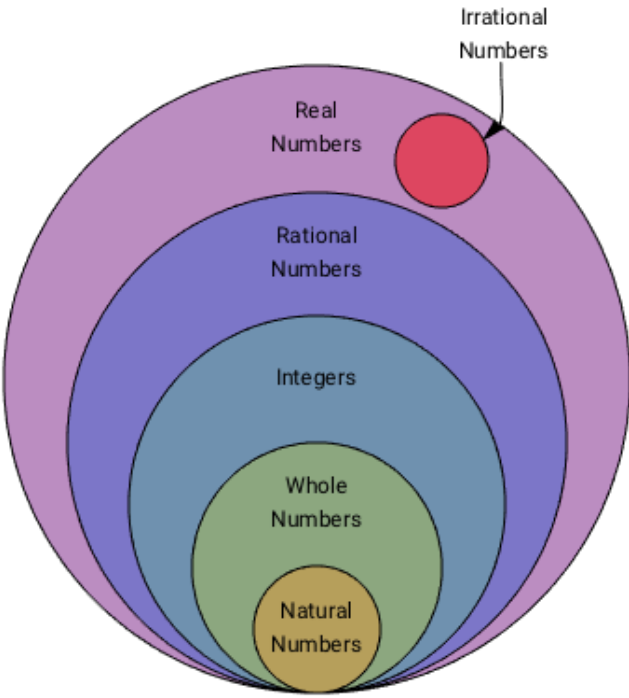


3.01 Exponents and Radicals

Topics	Space to practice & Video Links
<p>The Number System</p> 	<p>3.01Video1</p> <p><u>Examples</u> Natural Numbers: _____ Whole Numbers: Integers: Rational Numbers: Irrational Numbers:</p> <p>All of the types of numbers above are a part of the Real Numbers.</p>
<p>Zero Exponent Property Any number (except _____) with an exponent of _____ equals _____.</p> <p>Negative Exponent Property Any number raised to a _____ power is _____ to the _____ of the positive exponent of the number.</p>	<p>3.01Video2</p> <p>Example: $5^0 =$</p> <p>Example: $5^{-3} =$</p>
<p>Product of Powers Property To _____ two powers with the same base, _____ the _____.</p>	<p>3.01Video3</p> <p>Example: $5^4 \times 5^7 =$</p>

<p>Quotient of Powers Property To divide two powers with the same base, _____ the _____.</p>	<p>3.01Video4 Example: 5^7 _____ = 5^4</p>
<p>Power of a Product Property To find a power of a product, find the power of each _____ and then _____.</p> <p>Power of a Quotient Property To find a power of a quotient, find the power of _____ of the quotient, and then _____ by _____ common factors.</p>	<p>3.01Video5 Example: $(ab)^3 =$</p> <p>Example: $\left(\frac{a}{b}\right)^3 =$</p>
<p>Power of a Power Property To find a power of a power, _____ the exponents.</p> <p>Rational Exponent Property _____ powers, where a number is raised to a _____, can be converted to a _____. The numerator becomes the _____, and the denominator becomes the _____ of the radical.</p>	<p>3.01Video6 Example: $(5^3)^4 =$</p>

<p>More with the Rational Exponent Property</p> $x^{\frac{m}{n}} = \sqrt[n]{x^m}$ <p>The ___ is the _____. This means it is the expression _____ the radical symbol. The radicand may include an _____, but it doesn't have to.</p> <p>The ___ is the exponent of the _____. <i>*If there is no exponent on the _____, it is understood that it equals _____.</i></p> <p>The ___ is the index. When it is a variable, it is common to say the _____ root. For example, if the index were 4, we would call it the _____ root. <i>*When there is no index shown, it is understood that the index is _____, like the standard _____ root.</i></p>	<p>3.01Video7</p> <p>3.01Video8</p> <p>Example:</p> $6^{\frac{4}{5}} =$ <p>Example:</p> $\sqrt[3]{2}$ <p>Example:</p> $\sqrt{10} \times \sqrt[4]{10^3}$
<p>Adding/Subtracting Rational Numbers</p> <p>When adding or subtracting rational numbers you must have the same _____.</p> <p><i>*Any time two _____ numbers are added or subtracted, the answer will be _____.</i></p> <p>Multiplying Rational Numbers</p> <p>When multiplying rational numbers, _____ the _____ straight across, then _____ the _____ straight across.</p> <p><i>*Any time two _____ numbers are multiplied, the answer will be _____.</i></p>	<p>3.01Video9</p> <p>Example:</p> $\frac{2}{5} + \frac{1}{3}$ <p>Example:</p> $\frac{2}{5} * \frac{1}{3}$

<p>Adding Rational and Irrational Numbers</p> <p>When adding rational and irrational numbers together, we can combine _____ terms, but we cannot combine a _____ and an _____ number.</p> <p>*Any time a _____ number is added to an _____, the sum will be _____.</p> <p>Multiplying Rational and Irrational Numbers</p> <p>*Any time a _____ number is multiplied by an _____ number, the product will be _____.</p>	<p>3.01Video10</p> <p>Example:</p> $5 + 3\sqrt{2} =$ <p>Example:</p> $5 \cdot \sqrt{2} =$
<p>Simplifying Radicals</p> <p>Method 1: _____ Perfect Square Method</p> <p>Find the largest _____ square factor that goes into the number or expression, then simplify.</p> <p>Method 2: _____ Factor Method</p> <p>Factor a number into its _____ only, then simplify.</p>	<p>3.01Video11</p> <p>Example:</p> $\sqrt{75} =$ <p>Example:</p> $\sqrt{1250} =$

Adding and Subtracting Radicals

Working with operations on _____ is the same process as working with _____. Only _____ can be added or subtracted.

Multiplying Radicals

Multiplying radicals is also similar to working with _____. Be sure to _____ completely.

The _____ works the same with radicals as it does with integers and variables.

[3.01Video12](#)

Example:

$$5 + 3\sqrt{2} + 4\sqrt{2} =$$

Example:

$$3\sqrt{5} \cdot 4\sqrt{2} =$$

Example:

$$5(3\sqrt{5} + 4\sqrt{2}) =$$

Try it Out!

Simplify the expression $\sqrt{\sqrt[3]{5}}$ into an equivalent radical expression.

[3.01Video13](#)

$$\sqrt{\sqrt[3]{5}} =$$

Practice

Simplify the expression $\sqrt{125} - \sqrt{25} + \sqrt{5}$

[3.01Video14](#)

$$\sqrt{125} - \sqrt{25} + \sqrt{5} =$$

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- **Want More Practice?**

Topic	
Adding & Subtracting Rational Numbers	Try It
Multiplying & Dividing Rational Number	Try It
Multiplication w/ Rational Exponents	Try It
Division w/ Rational Exponents	Try It
Simplify Expressions w/ Rational Exponents	Try It
Powers of Exponents Practice	Try It
Simplify Radicals	Try It
Adding & Subtracting Radical Expressions	Try It
Simplify Radicals w/ Fractions	Try It
Multiply Radicals	Try It