More Power Rules of Exponents

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We will use this to expand our definition of exponents to fractions!

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This means $x^{1/2}$ is a number that when we square it we get x

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A number that when we square it we get x is: $\sqrt{x}$

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Conclusion: $x^{1/3} = \sqrt[3]{x}$

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Conclusion: $x^{1/3} = \sqrt[3]{x}$

In General: $x^{1/n}$ is a number that when raised to the n^{th} power is x

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Conclusion: $x^{1/2} = \sqrt{x}$

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This means $x^{1/3}$ is a number that when we cube it we get x

Conclusion: $x^{1/3} = \sqrt[3]{x}$

In General: $x^{1/n}$ is a number that when raised to the n^{th} power is x

In other words, for any integer n: $x^{1/n} = \sqrt[n]{x}$

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Our definition varied depending on if m is positive, negative, or 0

▸ We saw the Power Rule: $(x^{m})^{n} = x^{(m \cdot n)}$

In General: For any integer n: $x^{1/n} = \sqrt[n]{x}$

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▸ Recall: When we started out inventing numbers, we started with the Natural Numbers, included 0, then negative integers.

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Recall: When we started out inventing numbers, we started with the Natural Numbers, included 0, then negative integers.

Next we invented fractions of the form $\frac{1}{n}$ on our way to all fractions $\frac{m}{n}$

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We are following the same progression with "inventing" exponents.

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We just learned fractional exponents of the form $x^{1/n}$

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Next we will see how to have any fraction as an exponent!

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Conclusion: For any numbers n and m:

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We can now understand exponents for all fractions!