Math 8
Unit 2 Exponents

References

Glencoe/McGraw-Hill Grade 7 Plus: Chapter 3 Lessons 1-10; Chapter 4 Lessons 1-5

Textbook Online: connectED.mcgraw-hill.com

Helpful Links:
https://mathbitsnotebook.com/Algebra1/RatIrratNumbers/RNRatIrrat.html

http://www.math-play.com/rational-and-irrational-numbers-game/rational-and-irrational-numbers-game.html

https://www.mangahigh.com/en-us/math_games/number/exponents/square_and_cube_roots

http://www.math-play.com/square-root-game.html

https://www.mathgames.com/skill/8.22-convert-between-standard-and-scientific-notation

http://www.math-play.com/Scientific-Notation-Concentration/Scientific-Notation-Concentration.html

Dear Parents

Below you will find a list of concepts that your child will use and understand while completing Unit 2 Exponents. Also included are references, vocabulary and examples that will help you assist your child at home.

Concepts Students will Use and Understand

- An irrational number is a real number that can not be written as a ratio of two integers.
- All real numbers can be plotted on a number line.
- Exponents are useful for representing very large or very small numbers.
- Square roots can be rational or irrational.
- Some properties of real numbers hold for all irrational numbers.
- Solving multi-step equations
- Evaluate square and cubed roots

Vocabulary

Additive Inverse: The sum of a number and its additive inverse is zero. Also called the opposite of a number. Example: 5 and -5 are additive inverses of each other.

Irrational number: A real number whose decimal form is non-terminating and non-repeating that cannot be written as the ratio of two integers.

Radical: A symbol ($\sqrt{}$) that is used to indicate square roots.

Rational number: A number that can be written as the ratio of two integers with a nonzero denominator.

Scientific Notation (Exponential Notation): A representation of real numbers as the product of a number between 1 and 10 and a power of 10, used primarily for very large or very small numbers.

Square root: One of two equal factors of a nonnegative number. For example, 5 is a square root of 25 because $5 \cdot 5 = 25$. Another square root of 25 is -5 because $(-5) \cdot (-5) = 25$. The +5 is called the principle square root

Addition property of equality: Adding the same number to each side of an equation produces an equivalent expression.

Additive inverse: The sum of a number and its additive inverse is zero

Inverse operation: Pairs of operations that undo each other.

Multiplication property of equality: States that when both sides of an equation are multiplied by the same number, the remaining expressions are still equal.

Multiplicative inverse: Numbers are multiplicative inverses of each other if they multiply to equal the identity, 1.

Try http://intermath.coe.uga.edu/ for additional help.

Math 8 Unit 2 Exponents Practice Problems

Example 1

1. Simplify the following without negative exponents:

   a. 4^{-2}

   b. $\dfrac{3^2 x}{2^{-3} x^{-2}}$

   c. $7a^{-4}b^3 y^{-2}$

2. Change to standard form: 8.51×10^{-2}
3. Change to scientific notation: 107,000,000,000

Example 2

4. Find the following square roots, graph the results on a number line and explain why each result is rational or irrational:

   a. $\sqrt{144}$

   b. $\sqrt{56}$

5. Estimate the square root of 18.
6. What are the two square roots of 36?

7. Find the following cube roots: a) $\sqrt[3]{8}$ b) $\sqrt[3]{27}$

Example 3

8. Solve the following equation: $2x + 3(4x - 3) = 8 - 3x$

Answer Key

Example 1

1 a. $\dfrac{1}{16}$

   b. $72x^3$

   c. $\dfrac{7b^3}{a^4 y^2}$

2. 0.0851

3. 1.07×10^{11}

Example 2

4. a. 12, rational because it can be written as a ratio.

   b. about 7.48, irrational because the exact value is a non-terminating, non-repeating decimal.

5. Between 4 and 5; closer to 4; about 4.2

6. ± 6

7. a) 2   b) 3

Example 3

8. x = 1