Topic 1: Solve Problems Involving Real Numbers

Term	Meaning	Example
Real Number		
Rational Number		
Irrational Number		
Square Root		
Perfect Square		
Perfect Cube		
Cube Root		

Lesson 1: Understand Irrational Numbers

What is an integer?

Integers are (fill in the blanks from the video): _____ and

_____whole numbers. This also includes _____.

Examples of Integers are (write every example and any work shown in the video):

What is a rational number?

A rational number is a number (fill in the blanks from the video): These are created by _____

2 integers (denominator cannot be _____). Rational numbers CAN be _____ or

_____. They can also be a _____ or a _____, including

_____ decimals. Rational numbers CANNOT be decimals that NEVER

_____, yet never end. This is EXTRA: They can terminate, meaning that the decimal has an end.

Examples of rational numbers (write every example and any work in the video):

What is an irrational number?

Irrational numbers are (fill in the blanks from the video): Positive or negative _____,

_____, or _____ that go on forever and do NOT _____.

Examples of irrational numbers (write every example and any work in the video):

Lesson 3 Day 1: Evaluate Square Roots and Cube Roots

*Goal: Evaluate **square roots** and **cube roots** to solve problems*
*Evaluate **perfect squares** and **perfect cubes***

This is an example of an exponent.

The base is the number that is repeatedly multiplied to itself, the number of times that is the exponent number. In this example it would be: 7 x 7 x 7. Notice the base, 7, is repeatedly multiplied to itself 3 times, because the exponent is 3.

These expressions with exponents are given below. For each expression, label the base and the exponent. Then, explain the mathematical meaning by writing it in exponent form.

5^3	m^5	100^2
Expanded:	**Expanded:**	**Expanded:**

Similar to the inverse operations of addition and subtraction, raising a base to an exponent also has an inverse operation. Use the table below to explore one example.

Squares and Square Roots	***Squaring a number is raising that number to a power of _____ or multiplying a number by itself.** ***The square root is an _____ operation of squaring a number and "undoes" an exponent of 2.** ***The _____ square root is known as the principal square root.**	**The square root of x:** $\sqrt{x}$ **"What number times itself will give me x?**

In 1–4, use squares and square roots to evaluate the given expression.

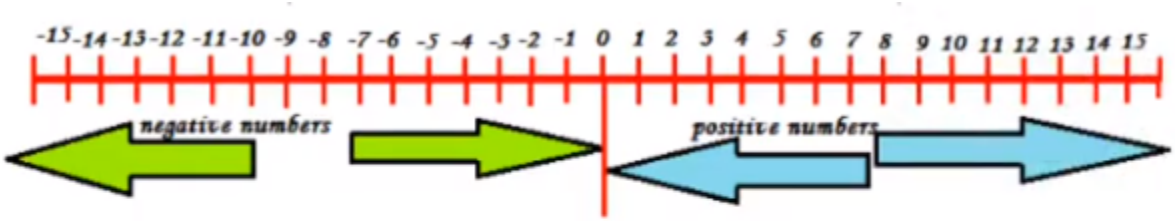
15^2	$\sqrt{144}$	$-(6)^2$	$\sqrt{49}$

5. Three equations are given below. Use inverse operations to isolate the variable. Be sure to check your solution by plugging it back into the original equation.

a. $x^2 = 81$	**b.** $m^2 = 9$	**c.** $f^2 = 400$

Lesson 2: Plot, Compare, and Order Real Numbers

*Goals: Approximate **square roots** by using **perfect squares***
*Compare and order **rational numbers***

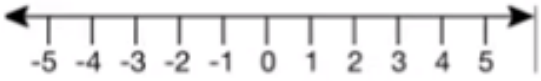


Steps for ordering real numbers:

1. Turn all real numbers into its decimal form
2. Approximate the decimal to 2 decimal places
3. Place number on number line

Compare and order the following numbers:

$5.2, -5.\overline{6}, 3\frac{9}{10}, \sqrt{21}$

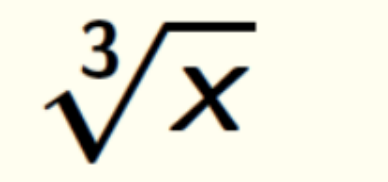


Compare 5.7145... and $\sqrt{29}$. Show your work.

Reasoning The "leech" is a technical term for the slanted edge of a sail. Is the length of the leech shown closer to 5 meters or 6 meters? Explain.

Lesson 3 Day 2: Evaluate Square Roots and Cube Roots

*Goal: Evaluate **square roots** and **cube roots** to solve problems*
*Evaluate **perfect squares** and **perfect cubes***

Cubes and Cube Roots	*Cubing a number is raising that number to a power of _____, or multiplying that number to itself three times. *The cube root is an _____ operation of cubing a number and "undoes" an exponent of 3.	Words: The cube room of x.  What number is multiplied to itself 3 times will give me x?

Complete the table as a reference of the first ten perfect cubes.

1^3	2^3	3^3	4^3	5^3	6^3	7^3	8^3	9^3	10^3

In, #6-9, use cubes and cube roots to evaluate the given expression.

$\sqrt[3]{512}$	$(-5)^3$	$\sqrt[3]{216}$	$(1/4)^3$

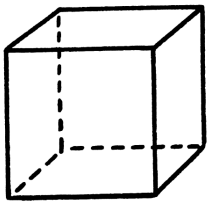
10. Three equations are given below. Use inverse operations to isolate the variable. Be sure to check your solution by plugging it back into the original equation.

a. $p^3 = 64$	b. $n^3 = 1{,}000$	c. $g^3 = 125$

Lesson 4: Solve Equations Using Square Roots & Cube Roots

Goal: ***Solve equations*** *in real world contexts, involving* ***square roots*** *and* ***cube roots****.*

Use your knowledge of square roots and cube roots to solve the following real world problems.

11. Trisha's Treats, a local bakery, has a square menu on the wall with a square area of 900 in^2. a. Write an equation that could find s, the side length of the sign. b. What is the side length of the sign?	12. The volume of a cube is shown below. a. Write an equation that could be used to find, x, one side length of the cube. b. Solve for x.  V = 729 in^3

Do negative answers make sense in these real-life contexts? _____

Why or why not? _____

_____

_____

When solving an equation, your goal is to _____ the variable by performing the _____.

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$64 = c^2$ $x^2 = 225$ $v^3 = 64$

$n^2 = 34$ $w^3 = 244$ $m^2 = 45$

$n^2 = x$ $p^3 = k$

Remember that each number has _____ square roots (_____ & _____)