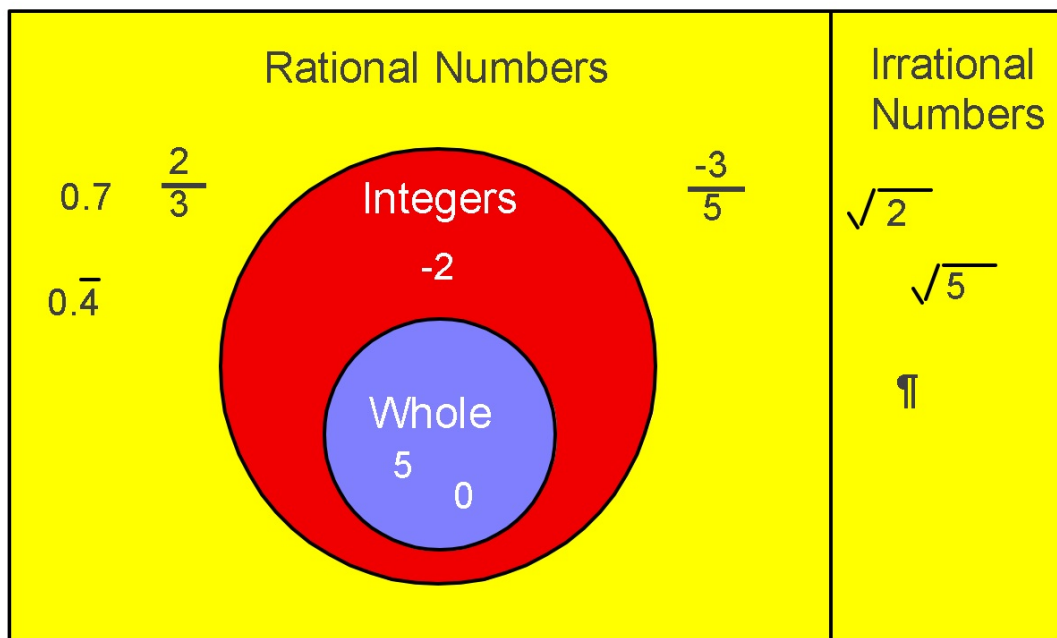


Real Numbers



Discovery of Square Roots and Real Numbers

Find the square root of the following numbers and classify them as either perfect square or non perfect square.

	Square Root	Perfect Square	Non Perfect Square
$\sqrt{49}$			
$\sqrt{11}$			
$\sqrt{122}$			
$-\sqrt{441}$			
$\sqrt{625}$			
$\sqrt{340}$			
$\sqrt{150}$			
$\sqrt{72}$			
$\sqrt{225}$			
$\sqrt{540}$			
$\sqrt{324}$			
$\sqrt{381}$			

What makes a perfect square different from a nonperfect square?

Look at the nonperfect square roots....Look at the $\sqrt{122}$. Does the decimal repeat or end?

Look at the perfect squares, their roots are integers.

Integers - whole numbers and their opposites (...-3, -2, -1, 0, 1, 2, 3...)

Nonperfect squares - their roots are not integers, the decimals do not repeat or end. They are irrational numbers.

REAL NUMBERS

All Rational and Irrational

IRRATIONAL

- Non-Perfect Squares
- Decimals that do not end or repeat

RATIONAL

Fractions, decimals (repeating too), integers, whole and natural
 $\frac{2}{3}$, 1.5, 2.34, $-\frac{6}{2}$, -9, 5, 0, $\sqrt{3}$

INTEGER

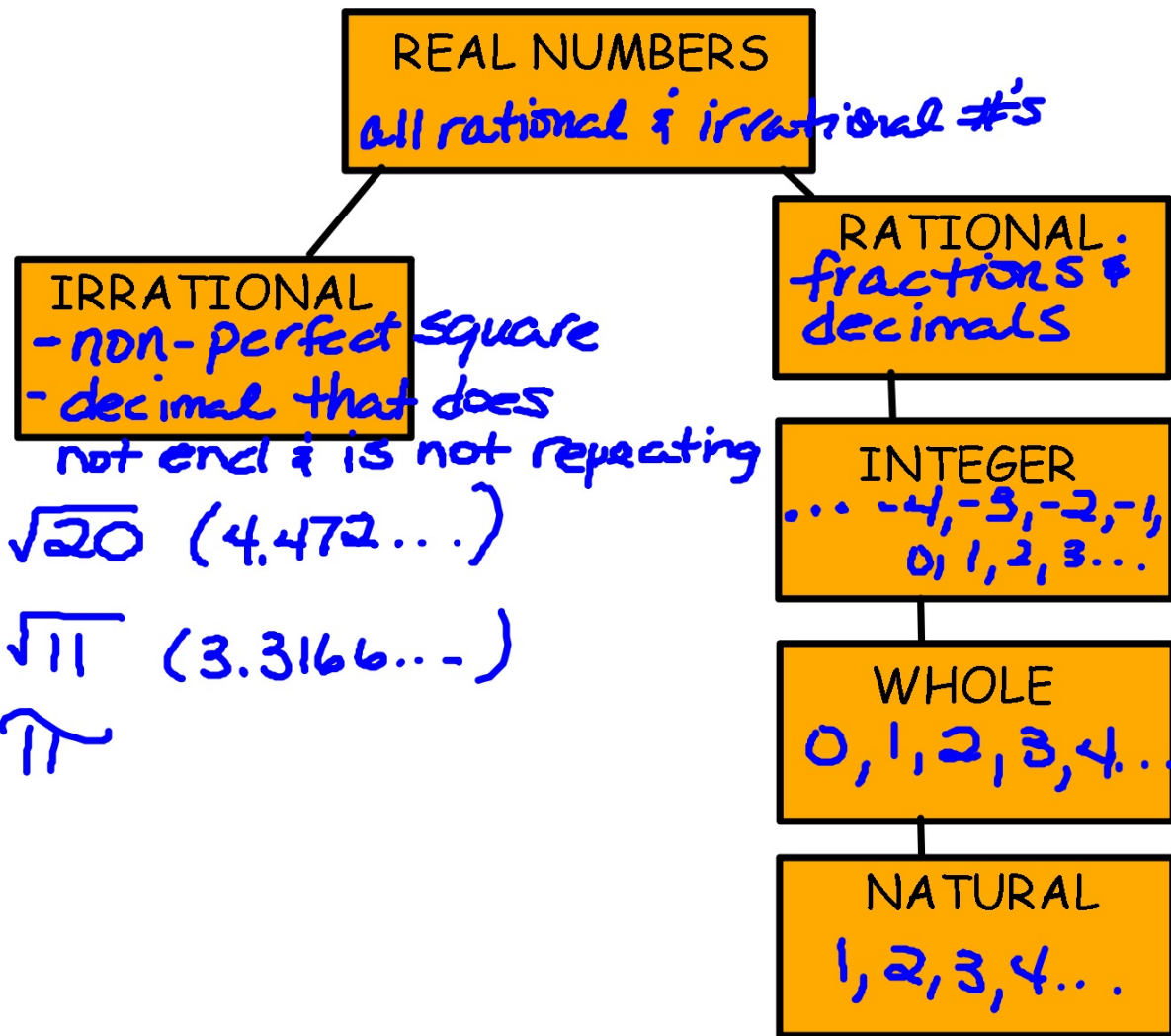
Positive and negative whole and natural (no frac. or dec.)
... -4, -3, -2, -1, 0, 1, 2, 3, ...

WHOLE

0, 1, 2, 3, 4, 5, ...

NATURAL

1, 2, 3, 4, 5, 6, ...



Rational	Irrational
Principle Perfect Square Roots	Principle Non-Perfect Square Roots
Negative Perfect Square Roots	Negative Non-Perfect Square Roots
Ex. $\sqrt{64}$ $\sqrt{36}$ $-\sqrt{289}$	Ex. $\sqrt{72}$ $\sqrt{115}$ $-\sqrt{249}$

real numbers - the set of irrational and rational numbers

rational numbers - a number that **can** be expressed as the quotient of two integers (as a fraction)

irrational numbers - a number that **cannot** be expressed as the quotient of two integers (as a fraction)

0.333333... $\bar{3}$ *rational*

2.449489743... *irr*

-12 *rat*

$\sqrt{144}$ *rat*

$\sqrt{58}$ *irr*

	Natural	Whole	Integer	Rational	Irrational	Real
$\sqrt{4} = 2$	✓	✓	✓	✓		✓
-4			✓	✓		✓
4.5				✓		✓
$4.\overline{5}$				✓		✓
4.5672589...					✓	✓
$\sqrt{5}$					✓	✓
$\sqrt{16} = 4$	✓	✓	✓	✓		✓
$12 \frac{1}{2}$				✓		✓

one or other

all #'s