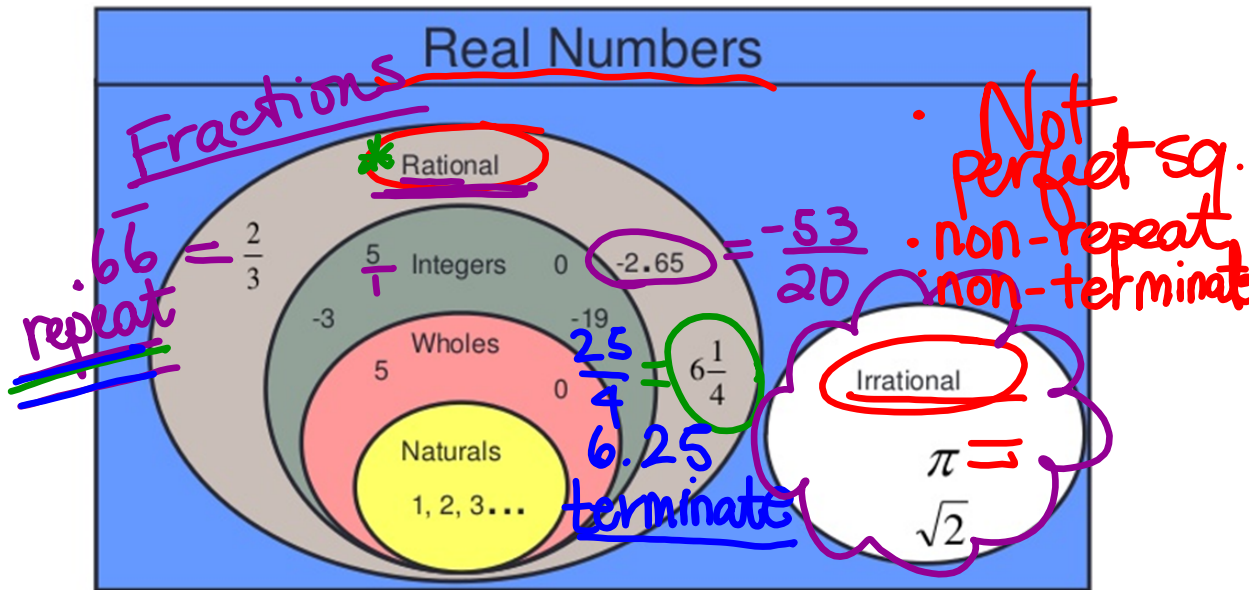


Rational and Irrational Operations



Number Classifications (from most general to most specific)

Real Numbers: a value that represents a quantity along a numberline.

- **Rational Numbers:** Numbers that can be expressed as a/b where a and b are integers. Look like whole numbers, terminating decimals, or repeating decimals.

— **Integers:** positive and negative whole numbers and zero.

+ **Whole Numbers:** positive integers and zero.

* **Natural Numbers:** positive integers. Does not include zero.

- **Irrational Numbers:** Numbers that CANNOT be expressed as a/b where a and b are integers. Look like non-terminating, non-repeating decimals.

Imaginary Numbers: a value that cannot be represented along a numberline. Created by taking an even-root of a negative number like $\sqrt{-2}$.

Example	Decimal Equivalence	Rational or Irrational?	<u>Specific Type</u>
1) 4.57	4.57	Rational	terminates
2) $-\frac{5}{3}$	$-1.\overline{6666}$	Rational	repeat
3) $\sqrt{8}$	2.828427...	Irrational	not a perfect square
4) $-\sqrt{9}$	-3.0	Rational	
5) 12	12.0	Rational	
6) $\frac{12}{5}$	2.4	Rational	
7) π	3.14.....	Irrational	
8) $5\sqrt{81}$	45.0	Rational	
9) $-\frac{4}{7}$	$-.5714285714$	Rational	
10) $2\sqrt{24}$	9.79795...	Irrational	
11) 0	0.0	Rational	
12) $\frac{\sqrt{3}}{2}$.866.....	Irrational	

Notes page 15 at bottom.

1) How would you describe the product of a rational and a rational number??

$5 \cdot \sqrt{25} =$ Always Rational

2) How would you describe the product of a rational and an irrational number?

$2 \cdot \sqrt{2}$ $2 \cdot \pi$ Always Irrational

3) How would you describe the product of an irrational and an irrational number?

$\sqrt{3} \cdot \sqrt{2} = \sqrt{6}$ Usually Irrational except multiply times itself

$\sqrt{7} \cdot \sqrt{7} = 7$

Notes page 16 at bottom.

1) How would you describe the sum of a rational and a rational number?

$$5 + 3$$

Always Rational

2) How would you describe the sum of a rational and an irrational number?

$$7 + \sqrt{3}$$

Always Irrational

3) How would you describe the sum of an irrational and an irrational number?

$$1) \sqrt{2} + \sqrt{3} =$$

Usually Irrational
except when

$$2) -\pi + \pi = 0$$

they are
opposites!

$$3) -\sqrt{7} + \sqrt{7} = 0$$