


## Unit 1: Exponents and Radicals



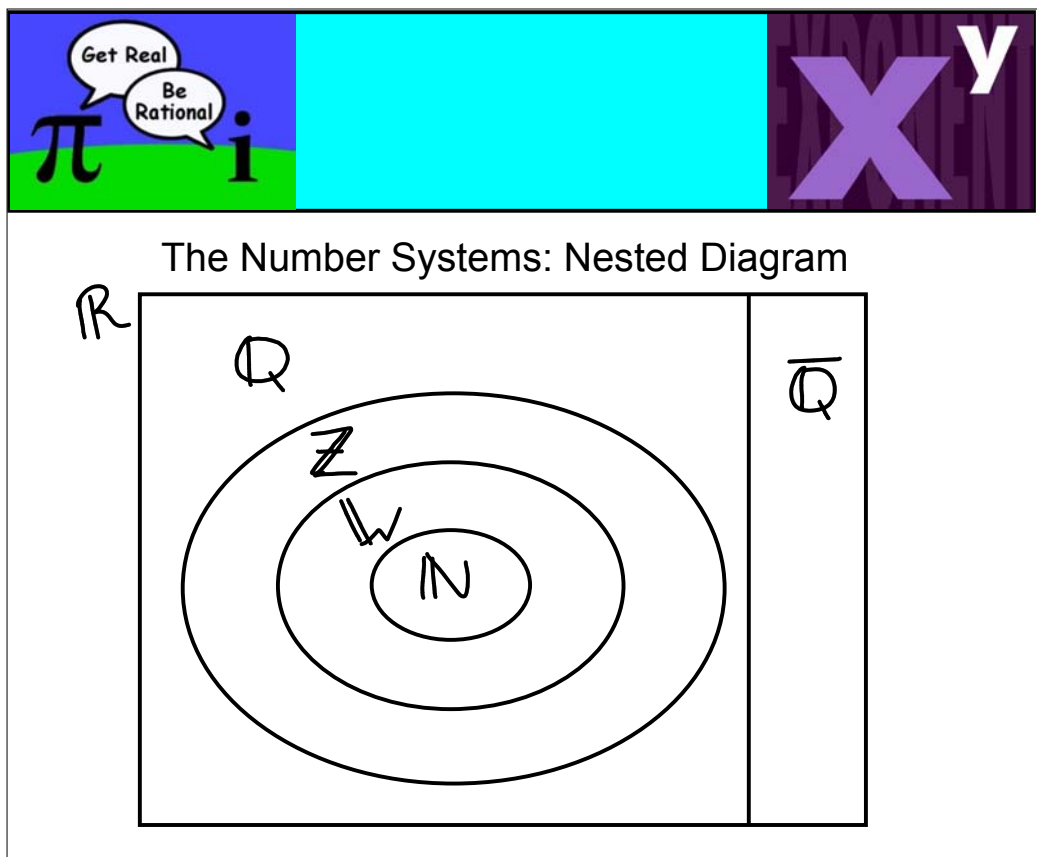
1.1: Number Sets


Every number that we work with in high school is classified as a Real Number ( $\mathbb{R}$ ). Within the Real Number System there are a variety of number sets:

- Natural Numbers: They are our countable numbers.  
 $\mathbb{N} = \{1, 2, 3, 4, \dots\}$
- Whole Numbers: Countable numbers and zero.  
 $\mathbb{W} = \{0, 1, 2, 3, \dots\}$
- Integers: All positive and negative whole numbers.  
 $\mathbb{Z} = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$
- Rational Numbers: Decimal numbers which repeat or terminate. These can all be written as a fraction.  
 $\mathbb{Q} = \{\dots, -3.33\dots, -1.5, - , 0, \sqrt{.16}, 5.9, \dots\}$

\*\*N, W, and I are all sets within the Rational Numbers.

- Irrational Numbers: A decimal number which does not terminate or repeat. It cannot be written as a fraction.  
 $\mathbb{Q} = \{\dots, 1.67983456\dots, \sqrt{12}, \dots\}$





Ex 1. For the following write all the sets of numbers to which the given number belongs. Write the answers from the largest to the smallest set.

a)  $9 = \frac{9}{1}$   
 $\mathbb{R}, \mathbb{Q}, \mathbb{Z}, \mathbb{W}, \mathbb{N}$ .

b)  $\sqrt{5} = 2.23606\dots$   
 $\mathbb{R}, \mathbb{Q}$ .

c)  $7/11$   
 $\mathbb{R}, \mathbb{Q}$ .


d)  $-7$   
 $\mathbb{R}, \mathbb{Q}, \mathbb{Z}$ .

e)  $\sqrt[3]{-27} = -3$   
 $\mathbb{R}, \mathbb{Q}, \mathbb{Z}$ .

f)  $2.346346346346\dots$   
 repeat  $\Rightarrow$  fraction  
 $\mathbb{R}, \mathbb{Q}$ .

g)  $1.11223344556677\dots$   
 $\mathbb{R}, \mathbb{Q}$ .  
 ↑  
 non-repeating non-terminating decimal

h)  $1.876$   
 $\mathbb{R}, \mathbb{Q}$ .



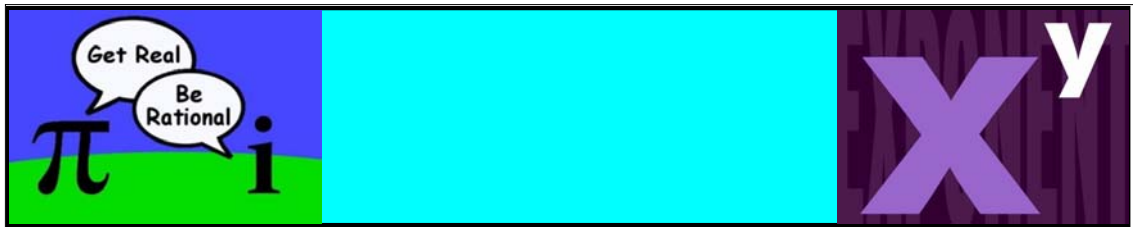
Using your graphing calculator to convert decimals into fractions:

If your decimal terminates or repeats follow these steps:

1. Type your decimal number (if it repeats make it obvious)

<u>Ti-NSpire</u>	<u>Ti-83/84</u>
2. Menu	2. Math
3. Number (2)	3. Frac (1)
4. Approx. to Fraction (2)	4. Enter

Ex.  $0.3333333\bar{3} = \frac{1}{3}$        $1.25 = \frac{5}{4}$



To learn more about number sets check out the following link:

<http://www.math10.ca/lessons/exponentsAndRadicals/numberSets/numberSets.php>