- On a sheet of paper, please write your name and what you think your weakest area in math is.

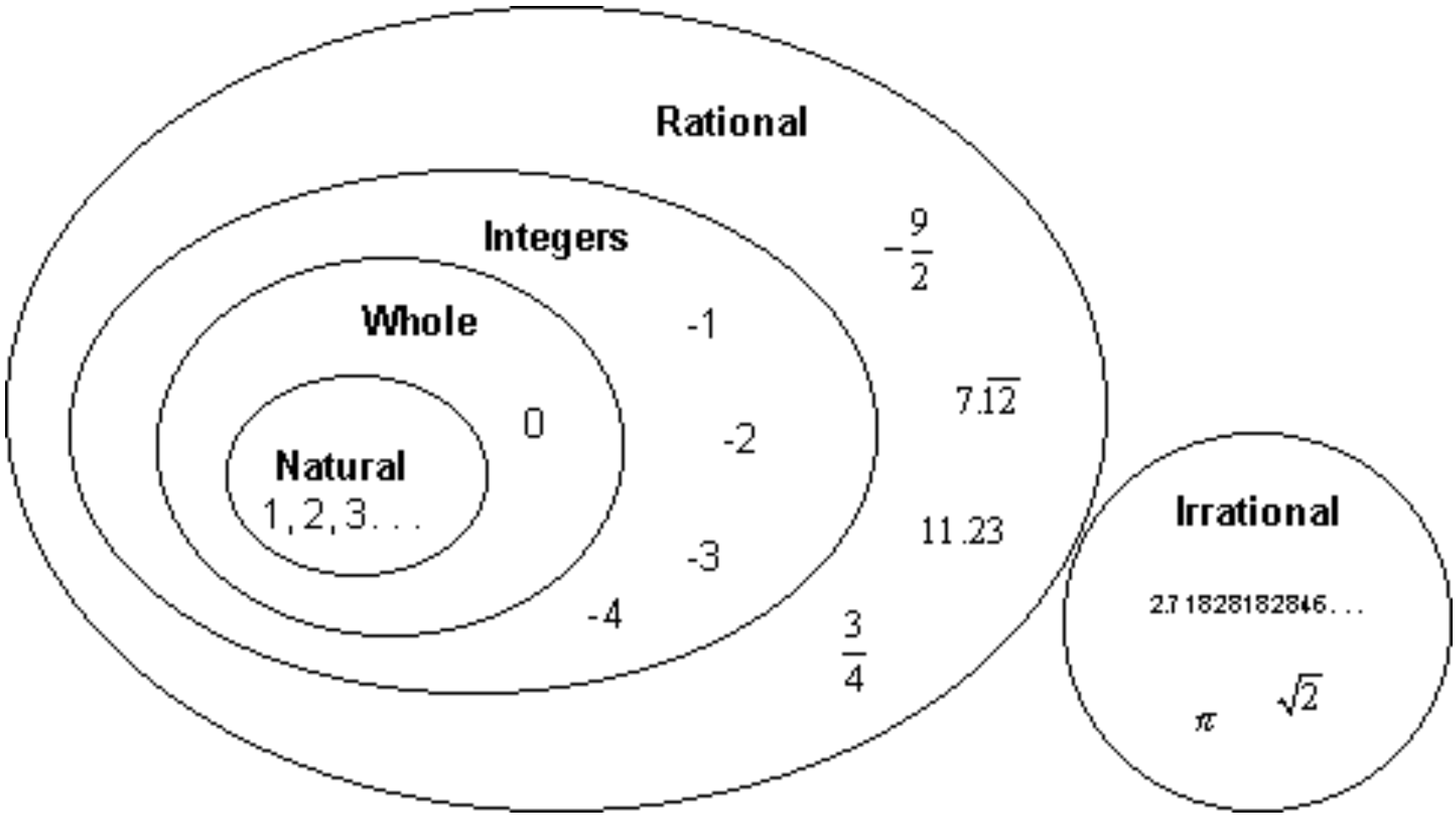
Real Numbers

Day 2

The Real Number Line

Organization of Real Numbers

- Real Numbers: {-∞ to ∞}
  - Rational numbers
    - Def: ***ALL*** **RATIONAL NUMBERS** CAN BE REPRESENTED AS A FRACTION (p/q, q≠0)
    - Ex: 0, 1, -1/3, 2 3/100, -1.2525252525
    - Note: Numbers with decimals that either repeat or terminate
    - Integers
      - Ex: 0, -1, 2, -3, 4, -5
      - Whole Numbers
        - » Ex: 0, 1, 2, 3, 4, 5
        - » Def: **Every positive** integer
        - » Natural Numbers
          - Ex: 1,2,3,4
          - Def: **Every positive** whole number **except for** 0, **is** a natural number
  - Irrational numbers
    - Def: ***NONE*** **OF THE IRRATIONAL NUMBERS** CAN BE REPRESENTED AS A FRACTION
    - Ex: √2, π
    - Note: Numbers with non-repeating non-terminating decimals


Rational
Integers
Whole
Natural
1, 2, 3. . .
0
-1
-2
-3
-4
$-\frac{9}{2}$
$7.\overline{12}$
11.23
$\frac{3}{4}$
Irrational
2.7 1828182846. . .
π
$\sqrt{2}$

Examples

$0.\overline{33333}$

$-\sqrt{17}$

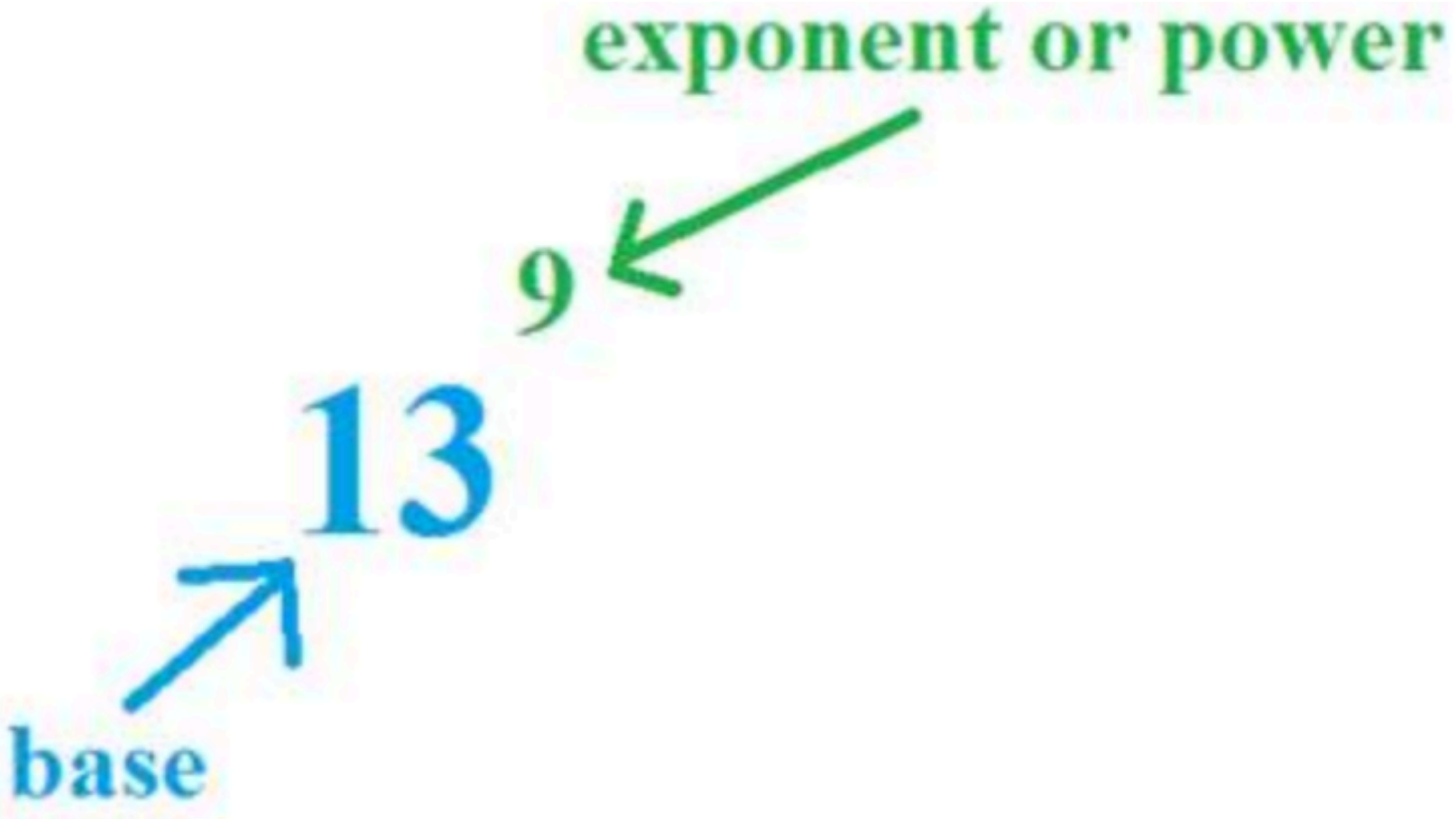
.2523

3.14159…

$-1297.3131313131313131\overline{31}$

Review:
Fractions, LCM, and LCD
See section 1.1

Exponents and the Order of Operations



Exponents

An exponent, or power, is denoted as a super script(raised number) to the right of another number, the base. It means, to multiply the base by its self, that many times.

b^p

- b, is the base
- p, is the power

Examples:

- $x^2=x*x$
- $3^3=3*3*3$

Class Examples

Try solving these:

$3^{2=}$

$2^{4=}$

$4^{2=}$

$9^{2=}$

Class Examples

Try solving these:

$3^2=9$

$2^4=16$

$4^2=16$

$2^3=8$

Question:

Why is $2^4=4^2$ but $2^3 \neq 3^2$?

Class Examples

Try solving these:

$3^2=3*3=9$

$2^5=2*2*2*2*2=32$

$5^2=5*5=25$

$9^3=9*9*9=729$

Rules of Exponents

$a^{-b}=1/(a^{b})$

$a^{b}a^{c}=a^{b+c}$

$a^{b}/a^{c}=a^{b-c}$

Examples

2^{-1}

$5^2 5^3$

$5^4 / 5^2$

Rules of Exponents(cont.)

$(a^b)^c=a^{bc}$

$a^{1/b}=\sqrt[b]{a}=c$

(Why is this special? Because $a=c^b$)

$(a/b)^c=a^c/b^c$

Examples

$(2^3)^2$

$25^{1/2}$

$(7/5)^2$

Class Examples

Try solving these:

$3^2 3^2$

$2^5 2^{-3}$

$25^{1/2}$

$9^{3/2}$

$(4/9)^{1/2}$

Class Examples

Try solving these:

$3^2 3^2 = 3^4 = (3*3)\ (3*3) = 9*9 = 81$

$2^5 2^{-3} = 2^{5-3} = (2*2*2*2*2)/(2*2*2) = 2^2 = 4$

$25^{1/2} = 5$

$9^{3/2} = \sqrt{}(9*9*9) = \sqrt{}(3*3*3*3*3*3) = 3*3*3 = 27$

$(4/9)^{1/2} = 2/3$

Lingo

- Please see the table on pg 39 in your ebook.

Practice

Skill Practice Translate each English phrase to an algebraic expression.

15. The product of 6 and y

Answer

16. The difference of the square root of t and 7

Answer

17. Twelve less than x

Answer

18. Twelve less x

Answer

19. One more than two times x

Answer

20. Five subtracted from the absolute value of w

Answer