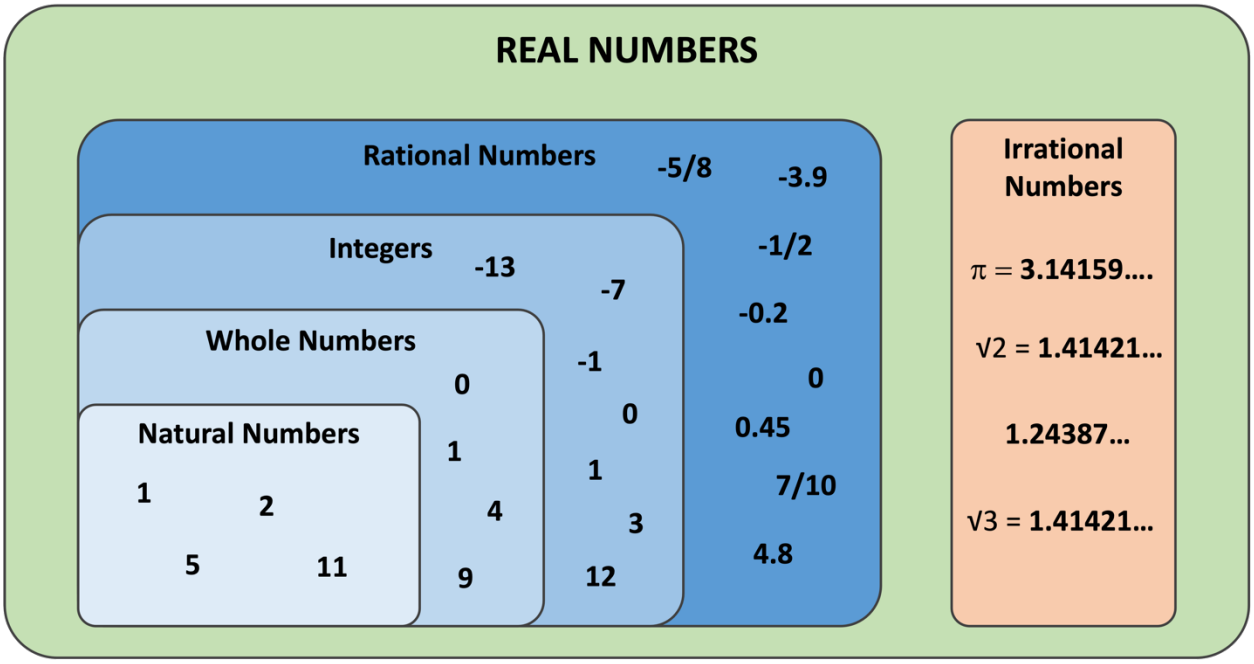
Types of Numbers



Natural Numbers
All Positive #'s:
Examples: 1, 2, 3, 4,....

Whole Numbers
All Positive #'s Including Zero:
Examples: 0, 1, 2, 3, 4,....

Integers
All Positive or Negative Whole #'s
Examples: ...,3, -2, -1, 0, 1, 2, 3,...

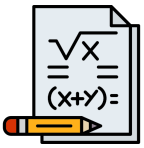
Rational Numbers
Any # that can be written as a fraction or decimal.
Examples: -1/3, 7/8, 0.6666...., 0.25,...

Irrational Numbers
Any # that cannot be written as a fraction.
Examples: π = 3.14159, $\sqrt{2}$ = 1.41421...

Special Types of Numbers

Prime Numbers
Special #'s with only two factors, 1 and itself.
Examples: 2, 3, 5, 7, 11, 13, 17, 19,...

Composite Number
Any # with 2 or more ***factors*** (i.e. can be made from combining prime #'s)
Example: 24 → 2 × 12 → 2 × (2 × 6)
→ 2 × 2 × (2 × 3)
so 24 is made of 2 × 2 × 2 × 3



Operations

⇒ Addition (+) → **Sum**
⇒ Subtraction (-) → **Difference**
⇒ Multiplication (×, *, •, (3)(4), 5y) → **Product**
⇒ Division (÷, ½, 7|121) → **Quotient**
⇒ Exponents/Powers/Order ($3^4 = 3 \times 3 \times 3 \times 3$) → **Repeated Multiplication**
⇒ Square Root ($\sqrt{9}$, $16^{1/2}$) → Produces a # that is equal to a specific quantity when multiplied by itself (i.e. it undoes exponents!)

Inequalities

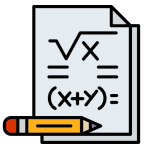
⇒ Equals Too (=)
⇒ Approximately Equal Too (≃)
⇒ Not Equal Too (≠)
⇒ Greater Than (>)
⇒ Less Than (<)
⇒ Great Than & Equal Too (≥)
⇒ Less Than & Equal Too (≤)

Order of Operations

Brackets
Exponents
Division
Multiplication
Addition
Subtraction

Brackets
Exponents
Division – **M**ultiplication*
Addition – **S**ubtraction*

**If the Same Precedence, Solve Left-to-Right*



Math Processes

Expand

Is to take the expression and perform operations to remove brackets (usually combine like terms as well)

Simplify

Is to reduce (an equation, fraction, etc) to a simpler form by cancellation of common factors, regrouping of terms in the same variable, etc.

Evaluate

Is to determine the numerical value of the expression for a given value of each variable in the expression.

Solve

To find a value (or values) we can put in place of a variable that makes the equation true.

Mr. O's Guide to Doing Solving Questions & Problems

⇒ ***Read*** the question first = Gain ***Understanding*** and Context
⇒ ***Re-Read*** the question again = Decode and ***Extract*** information
⇒ ***Draw*** Pictures / Diagrams & ***Label*** Key Information
⇒ Make an ***Estimate*** to what you think the answer should be.
⇒ Write out ***Formulas*** regardless of if you need it or not.
⇒ ***Check*** Answer = Does it make sense with your estimate and make sure you answered what was asked for.
⇒ ***Explain*** your answer with words, units, etc...

Tips

⇒ ***Layout*** work so it makes sense (use arrows if necessary)
⇒ ***Underline*** / ***Box*** preliminary and final answers = You may need to use later in the question.
⇒ ***Colour*** Coding
⇒ ***Units*** are your friend they will help guide you