1126

Sets and Venn Diagrams

SS: How can you use venn diagrams to organize and communicate quantitative info.

A set is a collection of numbers or objects

Ex:

$A = \{1, 3, 5, 7\}$

$V = \{a, e, i, o, u\}$

The number or objects in a set are called the elements or members of the set.

ex:

$N(A) = 4$

$N(V) = 5$

3 is a element of $A = 3 \in A$

$12 \notin A$ 12 is not an element of A

$\begin{bmatrix} e \in V \\ K \notin V \end{bmatrix}$

The set $\{\}$ or $\emptyset$ is called the empty set and contains no elements.

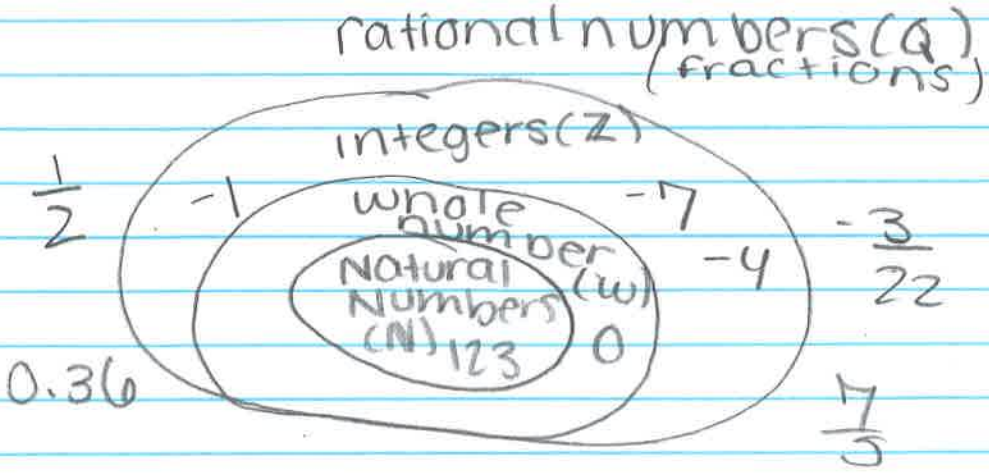
Null

$\mathbb{N} = \{0, 1, 2, 3, 4, 5, 6, 7 \ldots\}$ natural numbers

$\mathbb{Z} = \{0, \pm 1, \pm 2, \pm 3, \pm 4 \ldots\}$ integers

$\mathbb{Z}^+ = \{1, 2, 3, 4, 5, 6, 7 \ldots\}$ positive integer

$\mathbb{Z}^- = \{-1, -2, -3, -4, -5 \ldots\}$ negative integers



Irrational numbers (P)
calc. forever

π $\sqrt{2}$

$\sqrt{17}$ e

1 is not a prime number

Subsets

Suppose P & Q are 2 sets. P is a subset of Q if every element of P is also an element of Q. $P \subseteq Q$

ex: P. {2, 3, 5} $\subseteq$ Q {1, 2, 3, 4, 5, 6} every element in the 1st set in in the 2nd

Proper subset & improper subset

A {1, 2, 3, 4, 5} B = (1, 3, 4)
C = {2, 3, 1, 4, 5}

$B \subset A$ not

$C \subseteq A$ Proper

exact same

counting elements of sets

ex $A = \{2, 3, 9, 8, 13, 21\} = n(A) = 6$

A set which has a finite number of elements is called a finite.

infinite sets are sets which have infinitely many elements

$\{B / B \geq 0\}$

$\mathbb{N}, \mathbb{Z}, \mathbb{Z}^+, \mathbb{Z}^-, \mathbb{Q}, \mathbb{R}$ are infite sets

Union + intersection

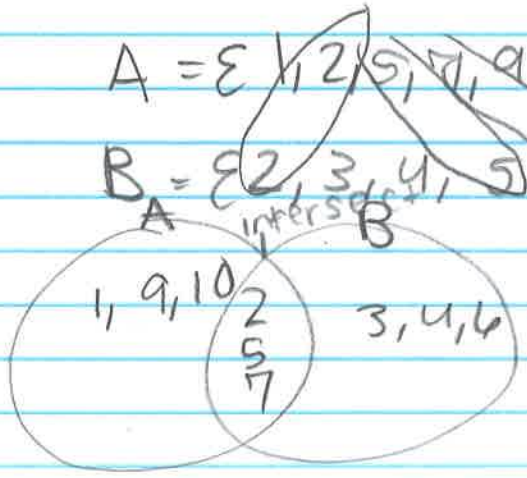
P + Q are 2 sets then

$P \cap Q$ (A) is the intersection of P + Q and consists of all elements which are both P and Q

$P \cup Q$ is the union of P + Q, and consists of all elements which are in P or Q

$A = \{1, 2, 5, 7, 9, 10\}$

$B = \{2, 3, 4, 5, 6, 7\}$



$n(P \cup B) = 9$

$n(P \cap B) = 3$

$P(A \cup B) = \{1, 2, 3, 4, 5, 6, 7, 9, 10\}$

$P(A \cap B = \{2, 5, 7\}$