Section 1.2: Subsets

Wednesday, September 30, 2015
11:53 AM

subsets: set A is a subset of B iff every member of A also belongs to B

$$A \subseteq B$$

↑ "is a subset of"

examples:

$\{2, 3, 4\} \subseteq \mathbb{N}$

$\{2, 3\} \subseteq \{2, 3, 4\}$

$\{2, 3\} \subseteq \{2, 3\}$

$\{2, 3\} \not\subseteq \{2\}$

why? $3 \notin \{2\}$

True or False?

$\mathbb{N} \subseteq \{2, 3\}$	F
$\mathbb{N} \subseteq \mathbb{Z}$	T
$\mathbb{Z} \subseteq \mathbb{N}$	F
$\mathbb{Z} \subseteq \mathbb{Z}$	T
$\emptyset \subseteq \mathbb{N}$	T

↑ in fact, $\emptyset$ is a subset of every set including itself

subsets: $A \subseteq B$

proper subsets: $A \subset B$

- set A is a proper subset of B iff every member of A belongs to B and there is at least one member of B that's not in A

examples:

$\{2, 3\} \subset \{2, 3, 4, 5, \pi, 157\}$

$\{2, 3\} \subseteq \{2, 3, 4, 5, \pi, 157\}$

$\{2, 3\} \not\subset \{2, 3\}$

$\{2, 3\} \subseteq \{2, 3\}$

True or False:

$\mathbb{N} \subset \mathbb{Z}$ T

$\mathbb{N} \subseteq \mathbb{Z}$ T

$\{1, 2, 3, \ldots\}$ $\{\ldots -3, -2, -1, 0, 1, 2, 3 \ldots\}$

$\mathbb{N} \subset \mathbb{N}$ F

$\mathbb{N} \subseteq \mathbb{N}$ T

$\mathbb{Z} \subset \mathbb{N}$ F

$\emptyset \subset \mathbb{Z}$ T

$\emptyset \subset \emptyset$ F