Examples and Problems

Examples and Problems

Example 1.6

Example 1.6 gives a bunch of true statements with explanations. May emphasize the difference between the notations $\in$ and $\subseteq$. Let's look at some of them.

$\downarrow$ element $\swarrow$ set

$$1 \in \{1, 2, 3\}$$

$$A \subseteq B$$

$$\{1\} \subseteq \{1, 2, 3\}$$

1.6.1

$1 \not\subseteq \{1, \{1\}\}$ true

$1 \subseteq \{1, \{1\}\}$

↑
set ?

NO

1 is NOT A SET!
So it can't be a subset.

1.6.3

$\{1\} \in \{1, \{1\}\}$

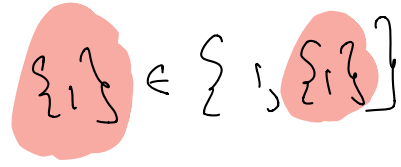element ↑ (under first $\{1\}$)
set ↗ (under second $\{1\}$)

true   because $\{1\} \in \{1, \{1\}\}$
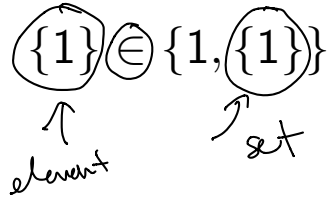
1.6.4

$\{1\} \subseteq \{1, \{1\}\}$

$\{1\} \subseteq \{1, \{1\}\}$

1.6.10

$\emptyset \subseteq \mathbb{N}$ $\emptyset$ <u>is a subset of every set</u> .

1.6.12

$N \not\subseteq \{N\}$

↑
st
ok↗

has only 1 element
Namely ∅ ∈ N

$N \in \{N\}$

$N \notin \{N\}$

Problem 1.3.9

Write out the elements of the set $\{\underline{X} : \underbrace{X \subseteq \{3, 2, a\}}\text{ and }\underbrace{|X| = 2}\} = B$

X has $2^3 = 8$ subsets

$B = \left\{ \{3, 2\}, \{2, a\}, \{3, a\} \right\}$