Module 5A: Sets and set relationships

MTH 225
5 Oct 2020

Agenda

- Review of Daily Prep activity + Q/A time
- Activity: Writing list comprehensions to "comprehend" set builder notation
- Activity: Jamboard activity to translate from set builder → Roster notation
- Wrap up with ungraded quiz + feedback time

The set $\mathbb{N}$ written in "roster notation" is

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

$$\{0, 1, 2, 3, \dots\}$$

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

None of the above

Consider the set $A = \{x^2 : x \in \mathbb{N}\}$. Which of the following is a true statement? Select all that apply.

$$4 \in A$$

$$5 \notin A$$

$$A \subseteq \mathbb{N}$$

$$A = \mathbb{N}$$

Let $A = \{2, 4, 8, 16, 32\}$ **and**
$B = \{x \in \mathbb{Z} \ : \ x^2 \text{ is even}\}$. **Then**

$A \subseteq B$

$B \subseteq A$

Both of the above

None of the above

List comprehension activity

https://colab.research.google.com/drive/1VhueyYrYXYhFaUV_gnzaQ-CYtIDcu_Jl?usp=sharing

Lists are like sets in roster notation.

List comprehensions are like sets in set-builder notation.

From the activity

The set of the first 100 powers of 2:

$$\{1, 2, 4, 8, 16, 32, \ldots, 2^{99}\}$$

$$\{2^n : n = 0, 1, 2, \ldots, 99\}$$

Same set -- different presentations, different points of view

INFINITE sets can't be done in Python*

ALL of the powers of 2 (that are integers):

$$\{1, 2, 4, 8, 16, 32, \ldots, \}$$
$$\{2^n : n \in \mathbb{N}\}$$

Same set -- different presentations,
different points of view

Jamboard activity: Working with the two set notations

The set $\{3x \; : \; x \in \quad \}$

Is a subset of $\mathbb{N}$

Is a subset of $\mathbb{Z}$

Is equal to $\{0, 3, 6, 9, 12, \ldots\}$

Both (a) and (b) but not (c)

All of the above

Which of the following are equal to the set $\{x \in \mathbb{Z} : 2 \leq x < 10\}$?

$\{3, 4, 5, 6, 7, 8, 9\}$

$\{2, 3, 4, 5, 6, 7, 8, 9\}$

$\{2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$\{\ldots, 3, 4, 5, 6, 7, 8, 9, 10\}$

None of the above

Recall that $\emptyset$ is the empty set or "null" set, i.e. the set with no elements. True or false: $\emptyset \subseteq A$ for every set A.

True

False

It depends on what A is

Have a great day 😃

Check in with email + campuswire + calendar to stay up to speed