

Lecture 9, class activity. Set theory.

Let us define

$$[0] = \{n \in \mathbb{Z} : n \equiv 0 \pmod{3}\},$$

$$[1] = \{n \in \mathbb{Z} : n \equiv 1 \pmod{3}\},$$

$$[2] = \{n \in \mathbb{Z} : n \equiv 2 \pmod{3}\}.$$

1. Write out each of the sets $[0]$, $[1]$, $[2]$ in roster notation.

2. Show that $\mathbb{Z} = [0] \cup [1] \cup [2]$.

3. Show that for $i \neq j$, $[i] \cap [j] = \emptyset$.

Note: What this means is that we have shown that the sets $[0]$, $[1]$, $[2]$ form a **partition** of \mathbb{Z} .