

Math 2283 - Introduction to Logic

Quiz #16 - 2016.02.22 Solutions

Let $U = \mathbb{Z}$, where \mathbb{Z} is the set of all integers (both positive and negative) and consider the following sets:

$$\mathbb{W} = \{0, 1, 2, 3, \dots\}$$

$$\mathbb{N} = \{1, 2, 3, \dots\}$$

$$2\mathbb{Z} = \{\dots, -4, -2, 0, 2, 4, \dots\}$$

$$3\mathbb{Z} = \{\dots, -6, -3, 0, 3, 6, \dots\}$$

$$6\mathbb{Z} = \{\dots, -12, -6, 0, 6, 12, \dots\}$$

Perform the following set operations:

1. $\mathbb{W} \cap \mathbb{N}$.

$$\mathbb{W} \cap \mathbb{N} = \mathbb{N}$$

2. $2\mathbb{Z} \cup 6\mathbb{Z}$.

$$2\mathbb{Z} \cup 6\mathbb{Z} = 2\mathbb{Z}$$

3. $2\mathbb{Z} \cap 6\mathbb{Z}$.

$$2\mathbb{Z} \cap 6\mathbb{Z} = 6\mathbb{Z}$$

4. $2\mathbb{Z}'$

$$2\mathbb{Z}' = \{\dots, -3, -1, 1, 3, \dots\}$$

5. $\mathbb{N} \cap 2\mathbb{Z}$.

$$\mathbb{N} \cap 2\mathbb{Z} = \{2, 4, 6, \dots\}$$

6. $3\mathbb{Z} \cup 6\mathbb{Z}$.

$$3\mathbb{Z} \cup 6\mathbb{Z} = 3\mathbb{Z}$$