
For each of the following problems, find the requested set. There is no partial credit on this part of the quiz. For each of the following problems use the sets:

$$U = \{1, 2, 3, 4, 5\}$$

$$X = \{1, 3, 5\}$$

$$Y = \{1, 2, 3\}$$

$$Z = \{3, 4, 5\}$$

1. $X \cap Y = \{1, 3\}$
2. $X \cup Y = \{1, 2, 3, 5\}$
3. $Y' = \{4, 5\}$
4. $Y \cup (X \cap Z) = Y \cup \{3, 5\} = \{1, 2, 3\} \cup \{3, 5\} = \{1, 2, 3, 5\}$
5. $X' \cap Y = \{2, 4\} \cap \{1, 2, 3\} = \{2\}$
6. $Y \cap U = \{1, 2, 3\} \cap \{1, 2, 3, 4, 5\} = \{1, 2, 3\}$
7. $Y \cap \emptyset = \emptyset$

Complete the following problem. Show all work, including an explanation, to receive full credit.

8. Explain why $n(\mathbb{N}) = n(\mathbb{Z})$.

The integers are the set $\mathbb{Z} = \{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$. We can rewrite this set so that it is $\{0, 1, -1, 2, -2, 3, -3, 4, -4, \dots\}$. In this way, each integer can be counted by assigning it the number of its position in the list.