

4.4

Intersection of Sets

• Example 1

Give a definition by extension of the set B below.

$$B = \{m \in \mathbb{Z} \mid -5 \leq m + 2 < 0\} \cap \{-10, -9, -7, -6, -5\}$$

\mathbb{Z} is the set of integers.

The set of integers determined by the inequality

$$-5 \leq m + 2 < 0 \text{ is } \{-7, -6, -5, -4, -3\}.$$

Using this result we rewrite B .

$$\begin{aligned} B &= \{-7, -6, -5, -4, -3\} \cap \{-10, -9, -7, -6, -5\} \\ &= \{-7, -6, -5\} \end{aligned}$$

• • • CHECK YOURSELF 1

Give a definition by extension of the set A determined by the following equation.

$$A = \{m \in \mathbb{Z} \mid -8 < m - 1 < -1\} \cap \{-4, -3, -2, -1, 0, 1, 2\}$$

• • • CHECK YOURSELF ANSWER

1. $\{-4, -3, -2, -1\}$.

4.4 Exercises

Name _____

Section _____

Date _____

A N S W E R S

1. _____
2. _____
3. _____
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10. _____
11. _____
12. _____

Write a definition by extension for each of the sets below. \mathbb{Z} is the set of integers and \mathbb{N} is the set of natural numbers.

1. $C = \{m \in \mathbb{Z} \mid -10 < m - 3 \leq 1\} \cap \{0, 1, 2, 3, 4, 5, 6\}$
2. $A = \{m \in \mathbb{Z} \mid 2 \leq m + 6 \leq 8\} \cap \{-2, -1, 0, 1, 2, 3, 4\}$
3. $D = \{n \in \mathbb{Z} \mid 0 \leq 2n - 2 \leq 6\} \cap \{5, 6, 7, 8, 9, 10\}$
4. $B = \{m \in \mathbb{Z} \mid -1 < 7 + m \leq 2\} \cap \{-10, -9, -8, -7, -6, -5\}$
5. $C = \{n \in \mathbb{Z} \mid -11 \leq 2n + 1 < 7\} \cap \emptyset$
6. $D = \{m \in \mathbb{Z} \mid -3 \leq 3m + 3 \leq 12\} \cap \{-5, -4, -3, -2, -1, 0, 1, 2, 3, 4\}$
7. $A = \{m \in \mathbb{Z} \mid -16 < 5m + 4 \leq -1\} \cap \{-3, -2, -1, 0, 1, 2, 3\}$
8. $B = \{m \in \mathbb{Z} \mid 5 < 2m < 8\} \cap \{1, 2, 3, 4, 5, 6, 7, 8\}$
9. $D = \{m \in \mathbb{Z} \mid -2 < 3m < 10\} \cap \{n \in \mathbb{Z} \mid n < -1\}$
10. $C = \{m \in \mathbb{Z} \mid -18 < 5m - 1 < 0\} \cap \{n \in \mathbb{Z} \mid -1 \leq n < 3\}$
11. $A = \{m \in \mathbb{Z}\} \cap \{n \in \mathbb{N}\}$
12. $B = \{n \in \mathbb{N} \mid n < 1\} \cap \{m \in \mathbb{Z} \mid m \geq 0\}$