

1. Explicitly write down all the elements of the set S given by

$$S = \{n \in \mathbb{N} : 2n \leq 8\}.$$

2. Take A and B to be the sets given by

$$A = \{-1, 1\} \quad \text{and} \quad B = \{-1, 0, 1\}.$$

Determine whether the following statements are true or false.

a) $A \subseteq B$

b) $B \subseteq A$

3. Take A , B and C to be the sets given by

$$A = \{-1, 1\}, \quad B = \{-1, 0, 1\} \quad \text{and} \quad C = \{0, 1, 5, 6\}.$$

Determine whether the following statements are true or false.

a) $A \subseteq B$

b) $B \subseteq A$

c) $C \subseteq A$

d) $B \subseteq C$

e) $C \subseteq B$

4. Take A and B to be the sets given by

$$A = \{-2, -1, 0, 1, 4\} \quad \text{and} \quad B = \{-1, 0, 1, 3\}.$$

Write out explicitly all elements.

a) $A \cup B$

b) $B \cap A$

5. Determine the following intersection:

$$\{1\} \cap \{-1, 0\}.$$

6. Take X, Y and Z to be the sets given by

$$X = \{x \in \mathbb{N} : x \text{ is even}\}, \quad Y = \{y \in \mathbb{N} : y < 21\} \quad \text{and} \quad Z = \{z \in \mathbb{N} : z \text{ is a multiple of } 3\}.$$

Determine

$$Z \cap (X \cap Y).$$

7. Take A and B to be the sets given by

$$A = \{-2, -1, 0, 1, 2\} \quad \text{and} \quad B = \{-3, -1, 0, 3\}.$$

Determine the following.

a) $A \setminus B$

b) $B \setminus A$