

Exercises 2: Set Operations

Exercises

1. Using an appropriate Venn Diagram in each case indicate the following sets.

(a) $(A \cap B) \cup B^c$

(e) $(A \cup B) \cap C$

(b) $A \setminus (A \setminus B)$

(f) $(A \cup B) \cap (A \cup C)$

(c) $A \cap (B \setminus A)$

(g) $A^c \cup B^c \cup C^c$

(d) $A \cup (B \cap C)$

(h) $A^c \cap (B \setminus C^c)$

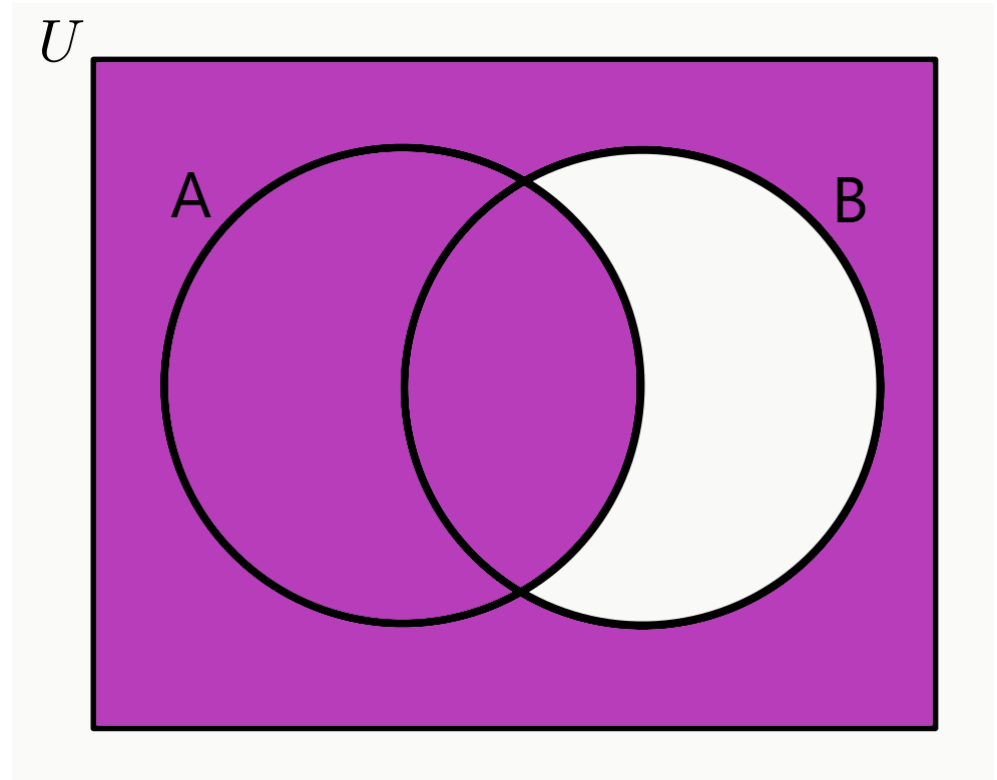
2. Write down the following sets by listing their elements:

(a) $\mathbb{P}\{0, 1, 2\}$

(b) $\{0, 1, 2\} \times \{1, 2\}$

3. Give an example of three sets A , B and C such that $A \cap B \cap C = \emptyset$, but $A \cap B$, $B \cap C$ and $C \cap A$ are all non-empty.

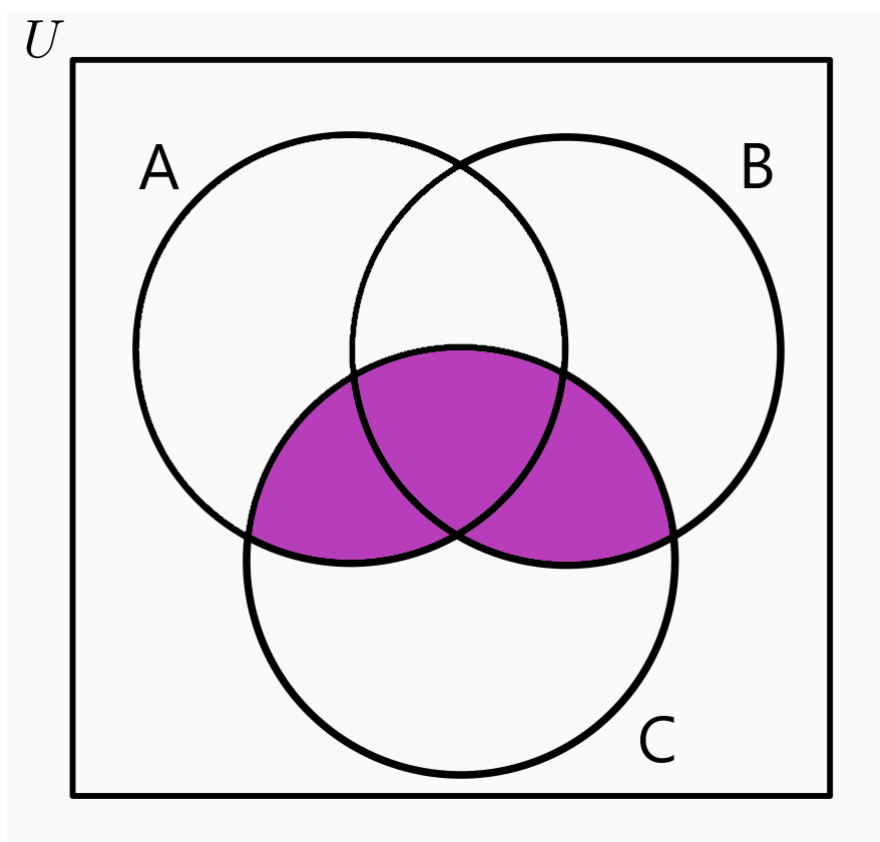
Solutions







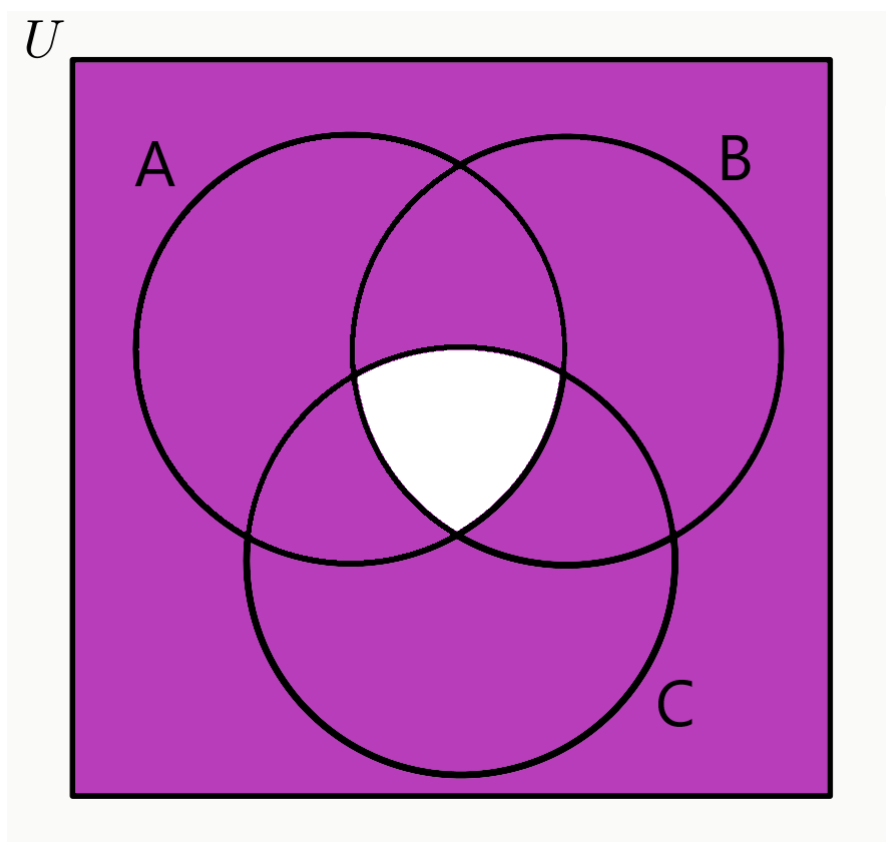
(d)



(e)



(f)



(g)



(h)

2. Write down the following sets by listing their elements:

(a) $\mathbb{P}\{0, 1, 2\} = \{\emptyset, \{0\}, \{1\}, \{2\}, \{0, 1\}, \{0, 2\}, \{1, 2\}, \{0, 1, 2\}\}$

(b) $\{0, 1, 2\} \times \{1, 2\} = \{(0, 1), (0, 2), (1, 1), (1, 2), (2, 1), (2, 2)\}$

3. $A = \{1, 2\}$, $B = \{1, 3\}$, $C = \{2, 3\}$ is but one example.