

Exercise walk-through

E1.2

Sets

IGCSE Mathematics

You must be able to

- use the symbols $\cup$, $\cap$, A' , $\in$, $n(A)$
- list elements of unions and intersections
- shade and read regions of a Venn diagram

1

The method

Method — Union, intersection, complement

- $A \cup B$ **union** : in A **or** B (or both). $A \cap B$ **intersection** : in **both**.
- A' **complement** : everything **not** in A . $n(A)$: the number of elements in A .
- **Worked:** $\mathcal{E} = \{1-10\}$, $A = \{2, 4, 6, 8, 10\}$, $B = \{3, 6, 9\} \rightarrow A \cap B = \{6\}$,
 $A \cup B = \{2, 3, 4, 6, 8, 9, 10\}$, $n(A \cup B) = 7$.

Answer shapes: **M1** a correct method, **A1** the correct answer.

Exercises 2.1·2.3

2.1 $\mathcal{C} = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 6, 8\}$. List the elements of $A \cap B$. [1]

2.2 For the same sets, list the elements of $A \cup B$. [2]

2.3 For the same sets, find $n(A')$. [2]

Exercises 2.1·2.3

2.1 $\mathcal{C} = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{1, 2, 3, 4\}$, $B = \{2, 4, 6, 8\}$. List the elements of $A \cap B$. [1]

2.1

- $A \cap B$ is the elements in **both**
 - **$\{2, 4\}$**
-

2.2 For the same sets, list the elements of $A \cup B$. [2]

2.2

- $A \cup B$ is the elements in A or B or both
 - **$\{1, 2, 3, 4, 6, 8\}$**
-

2.3 For the same sets, find $n(A')$. [2]

2.3

- $A' = \{5, 6, 7, 8\}$
- **$n(A') = 4$**

Exercise 3.1 (a)

3.1 $\mathcal{E} = \{x : 1 \leq x \leq 12, x \text{ is an integer}\}$, $P = \{\text{multiples of } 3\}$, $Q = \{\text{factors of } 12\}$.

(a) List the elements of $P \cap Q$.

[2]

Exercise 3.1 (a)

3.1 $\mathcal{E} = \{x : 1 \leq x \leq 12, x \text{ is an integer}\}$, $P = \{\text{multiples of } 3\}$, $Q = \{\text{factors of } 12\}$.

(a) List the elements of $P \cap Q$.

[2]

(a)

- $P = \{3, 6, 9, 12\}$, $Q = \{1, 2, 3, 4, 6, 12\}$
- $P \cap Q = \{\mathbf{3, 6, 12}\}$

Exercise 3.1 (b)

3.1 $\mathcal{E} = \{x : 1 \leq x \leq 12, x \text{ is an integer}\}$, $P = \{\text{multiples of } 3\}$, $Q = \{\text{factors of } 12\}$.

(b) Find $n(P \cup Q)$.

[2]

Exercise 3.1 (b)

3.1 $\mathcal{E} = \{x : 1 \leq x \leq 12, x \text{ is an integer}\}$, $P = \{\text{multiples of } 3\}$, $Q = \{\text{factors of } 12\}$.

(b) Find $n(P \cup Q)$.

[2]

(b)

- $P \cup Q = \{1, 2, 3, 4, 6, 9, 12\}$
- $n(P \cup Q) = \mathbf{7}$

Exercise 3.2

3.2 On a Venn diagram with sets A and B , describe in words the region $A \cap B'$. [1]

Exercise 3.2

3.2 On a Venn diagram with sets A and B , describe in words the region $A \cap B'$. [1]

3.2

- $A \cap B'$ is the part of circle A **outside** the overlap
- the elements that are in A but **not** in B