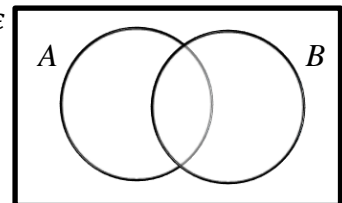
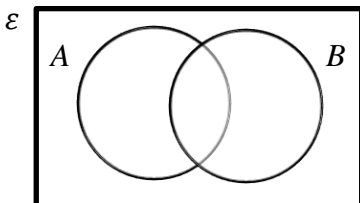
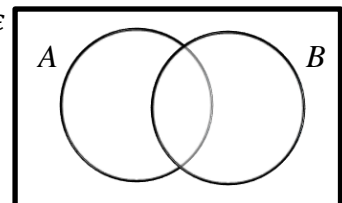
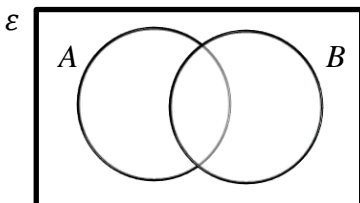
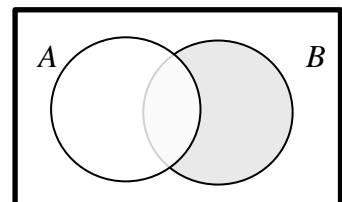
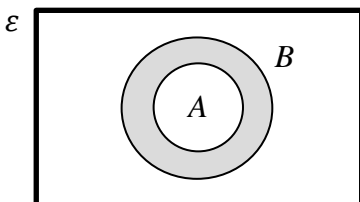
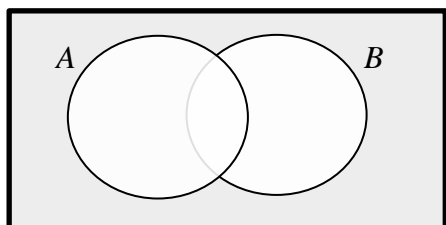


6 MUST KNOW QUESTIONS TO CONQUER SETS

1	<p>Shade the required sets in the Venn diagrams below.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>(a) $A' \cap B$</p>  </div> <div style="text-align: center;"> <p>(b) $(A \cap B)'$</p>  </div> </div>
b	<p>Shade the required sets in the Venn diagrams below.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>(a) $A' \cap (A' \cap B)$</p>  </div> <div style="text-align: center;"> <p>(b) $(A \cup B) \cap B'$</p>  </div> </div>
c	<p>Write down the set represented by the following shaded region.</p> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="text-align: center; margin-top: 20px;">  </div>

- 2 $\varepsilon = \{\text{natural number less than } 10\}$
 $A = \{\text{factors of } 6\}$
 $B = \{\text{prime numbers}\}$
 $C = \{\text{perfect squares}\}$

Use one of the symbols below to complete each statement.

$$\emptyset \quad \in \quad \subseteq \quad \subset \quad \notin$$

- (a) $B \cap C = \dots\dots\dots$
 (b) $\{2, 3\} \dots\dots\dots A$
 (c) $8 \dots\dots\dots (A \cup B)' \cap C'$

Ans:

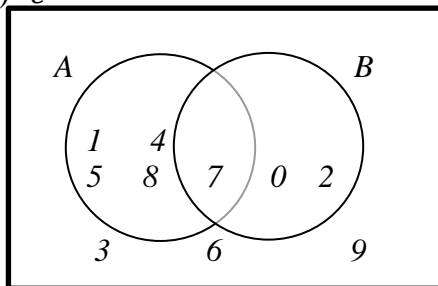
- (a) $B \cap C = \emptyset$
 (b) $\{2, 3\} \subset A$
 (c) $8 \in (A \cup B)' \cap C'$

- 3 It is given that $\xi = \{x: x \text{ is an integer between } 0 \text{ and } 9 \text{ inclusive}\}$ and $A \subset \xi$ and $B \subset \xi$
 $\{0, 2\} \subset (A' \cap B)$, $7 \in A \cap B$, $\{1, 4, 5, 8\} \subset ((A \cup B) \cap B')$ and $3, 6, 9 \notin (A \cup B)$

- a) Draw a Venn diagram to represent the information given.
 b) List down all the proper subsets of the set $\{a, b, c\}$.

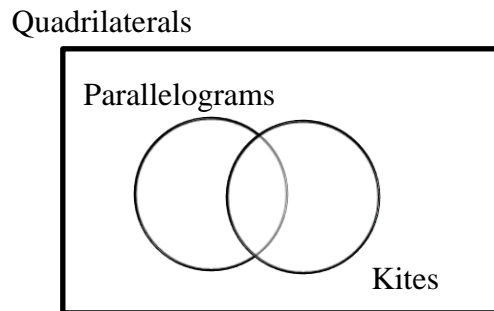
Ans:

- (a) ε



- (b) $\{\}, \{a\}, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{a, c\}$

4 The Venn diagram illustrates the relationship between two different types of quadrilaterals.



(a) What special shape is represented by the intersection of the sets representing Parallelograms and Kites?

(b) Using an appropriate symbol, complete the statement:
 {Parallelograms}.....{Trapeziums}

Ans:

(a) Rhombus

(b) \subset or \subseteq

5 Given the sets $\xi = \{x: x \text{ is an integer}\}$, $C = \{x: x - 5 \leq 6x + 9 \leq 22\}$, $D = \{x: x \text{ is a prime number which is not more than } 20\}$ and $E = \{x: x \text{ is an even number which is at least } 2 \text{ and at most } 8\}$,

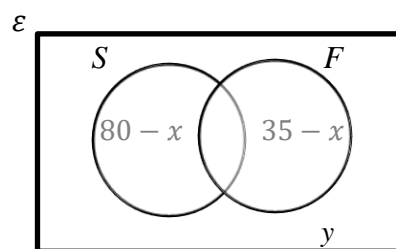
(a) list the element(s) of $C \cap D$,

(b) find $n(D \cup E)$.

Ans:

(a) $\{2\}$ (b) $n(D \cup E) = 11$

6 In a group of 100 students, 80 students study Russian and 35 students study German. x students study Russian and German. y students study neither Russian nor German. The Venn diagram below illustrates this information.



(a) The value of x is $n(S \cap F)$ in set notation. Express the value of y in set notation.

(b) Find, in its simplest form, an expression for y in terms of x .

(c) State

(i) the least possible value of x ,

(ii) the greatest possible value of y .

Answer:

(a) $n(S \cup F)'$, (b) $y = x - 15$, (c) $x = 15$, (ii) $y = 20$