

# SATPREP

## Assignment : Sets

In this exercise, be careful to use set notation only when the answer is a set.

1. If  $M = \{1, 2, 3, 4, 5, 6, 7, 8\}$ ,  $N = \{5, 7, 9, 11, 13\}$ , find:

- a)  $M \cap N$                       b)  $M \cup N$                       c)  $n(N)$                       d)  $n(M \cup N)$

State whether true or false:

- e)  $5 \in M$                       f)  $7 \in (M \cup N)$                       g)  $N \subset M$                       h)  $\{5, 6, 7\} \subset M$

2. If  $A = \{2, 3, 5, 7\}$ ,  $B = \{1, 2, 3, \dots, 9\}$ , find:

- a)  $A \cap B$                       b)  $A \cup B$                       c)  $n(A \cap B)$                       d)  $\{1, 4\} \cap A$

State whether true or false:

- e)  $A \in B$                       f)  $A \subset B$                       g)  $9 \subset B$                       h)  $3 \in (A \cap B)$

3. If  $X = \{1, 2, 3, \dots, 10\}$ ,  $Y = \{2, 4, 6, \dots, 20\}$  and  $Z = \{x : x \text{ is an integer, } 15 \leq x \leq 25\}$ , find:

- a)  $X \cap Y$                       b)  $Y \cap Z$                       c)  $X \cap Z$   
d)  $n(X \cup Y)$                       e)  $n(Z)$                       f)  $n(X \cup Z)$

State whether true or false:

- g)  $5 \in Y$                       h)  $20 \in X$                       i)  $n(X \cap Y) = 5$                       j)  $\{15, 20, 25\} \subset Z$ .

4. If  $D = \{1, 3, 5\}$ ,  $E = \{3, 4, 5\}$ ,  $F = \{1, 5, 10\}$ , find:

- a)  $D \cup E$                       b)  $D \cap F$                       c)  $n(E \cap F)$   
d)  $(D \cup E) \cap F$                       e)  $(D \cap E) \cup F$                       f)  $n(D \cup F)$

State whether true or false:

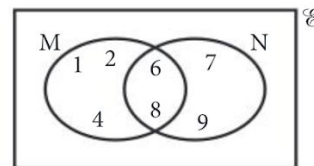
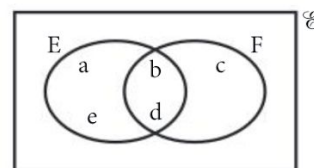
- g)  $D \subset (E \cup F)$                       h)  $3 \in (E \cap F)$                       i)  $4 \notin (D \cap E)$

5. Find:

- a)  $n(E)$                       b)  $n(F)$                       c)  $E \cap F$   
d)  $E \cup F$                       e)  $n(E \cup F)$                       f)  $n(E \cap F)$

6. Find:

- a)  $n(M \cap N)$                       b)  $n(N)$                       c)  $M \cup N$   
d)  $M' \cap N$                       e)  $N' \cap M$                       f)  $(M \cap N)'$   
g)  $M \cup N'$                       h)  $N \cup M'$                       i)  $M' \cup N'$



## Answer

- |                        |  |                          |                    |
|------------------------|--|--------------------------|--------------------|
| 1. a) {5, 7}           | b) {1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13} | c) 5                     | d) 11              |
| e) true                | f) true                                | g) false                 | h) true            |
| 2. a) {2, 3, 5, 7}     | b) {1, 2, 3, ..., 9}                   | c) 4                     | d) $\emptyset$     |
| f) true                | g) false                               | h) true                  | e) false           |
| 3. a) {2, 4, 6, 8, 10} | b) {16, 18, 20}                        | c) $\emptyset$           | d) 15              |
| f) 21                  | g) false                               | h) false                 | i) true            |
| 4. a) {1, 3, 4, 5}     | b) {1, 5}                              | c) 1                     | d) {1, 5}          |
| f) 4                   | g) true                                | h) false                 | i) true            |
| 5. a) 4                | b) 3                                   | c) {b, d}                | d) {a, b, c, d, e} |
| 6. a) 2                | b) 4                                   | c) {1, 2, 4, 6, 7, 8, 9} | d) {7, 9}          |
| f) {1, 2, 4, 7, 9}     | g) {1, 2, 4, 6, 8}                     | h) {6, 7, 8, 9}          | i) {1, 2, 4, 7, 9} |
|                        |  |                          | e) 5      f) 2     |
|                        |  |                          | e) {1, 2, 4}       |

