

Maharashtra Board Solutions Class 9-Maths

(Part 1): Chapter 1.3- Sets

BOOK SOLUTIONS
CLASS 9
MATHS

CHAPTER 1.3
Sets



Maharashtra Board Solutions→

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Maharashtra Board Solutions Class 9-Maths

(Part 1): Chapter 1.3- Sets

Class 9: Maths Chapter 1.3 solutions. Complete Class 9 Maths Chapter 1.3 Notes.

Maharashtra Board Solutions Class 9-Maths (Part 1): Chapter 1.3- Sets

Maharashtra Board 9th Maths Chapter 1.3, Class 9 Maths Chapter 1.3 solutions

Question 1.

If $A = \{a, b, c, d, e\}$, $B = \{c, d, e, f\}$, $C = \{b, d\}$, $D = \{a, e\}$, then which of the following statements are true and which are false?

- i. $C \subseteq B$
- ii. $A \subseteq D$
- iii. $D \subseteq B$
- iv. $D \subseteq A$
- v. $B \subseteq A$
- vi. $C \subseteq A$

Ans:

i. $C = \{b, d\}$, $B = \{c, d, e, f\}$

$C \subseteq B$

False

Since, all the elements of C are not present in B.

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ii. $A = \{a, b, c, d, e\}$, $D = \{a, e\}$

$A \subseteq D$

False

Since, all the elements of A are not present in D.

iii. $D = \{a, e\}$, $B = \{c, d, e, f\}$

$D \subseteq B$

False

Since, all the elements of D are not present in B.

iv. $D = \{a, e\}$, $A = \{a, b, c, d, e\}$

$D \subseteq A$

True

Since, all the elements of D are present in A.

v. $B = \{c, d, e, f\}$, $A = \{a, b, c, d, e\}$

$B \subseteq A$

False

Since, all the elements of B are not present in A.

vi. $C = \{b, d\}$, $A = \{a, b, c, d, e\}$

$C \subseteq A$

True

Since, all the elements of C are present in A.

Question 2.

Take the set of natural numbers from 1 to 20 as universal set and show set X and Y using Venn diagram. [2 Marks each]

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i. $X = \{x \mid x \in \mathbb{N}, \text{ and } 7 < x < 15\}$

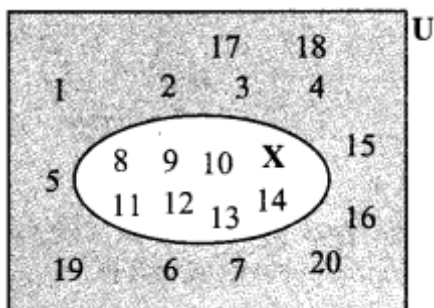
ii. $Y = \{y \mid y \in \mathbb{N}, y \text{ is a prime number from 1 to 20}\}$

Answer:

i. $U = \{1, 2, 3, 4, \dots, 18, 19, 20\}$

$x = \{x \mid x \in \mathbb{N}, \text{ and } 7 < x < 15\}$

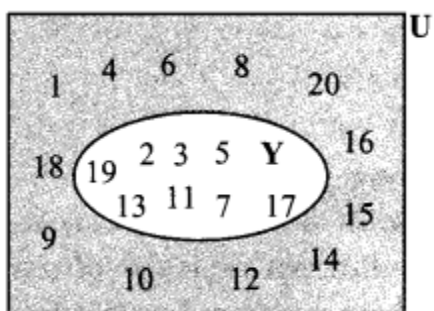
$\therefore x = \{8, 9, 10, 11, 12, 13, 14\}$



ii. $U = \{1, 2, 3, 4, \dots, 18, 19, 20\}$

$Y = \{y \mid y \in \mathbb{N}, y \text{ is a prime number from 1 to 20}\}$

$\therefore Y = \{2, 3, 5, 7, 11, 13, 17, 19\}$



Question 3.

$U = \{1, 2, 3, 7, 8, 9, 10, 11, 12\}$ $P = \{1, 3, 7, 10\}$, then

i. show the sets U, P and P' by Venn diagram.

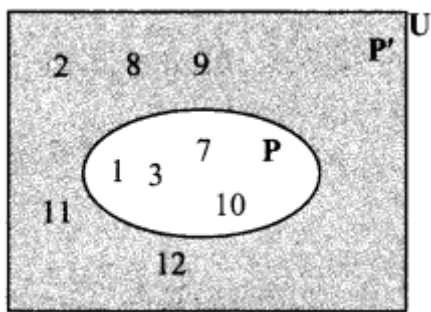
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ii. Verify $(P')' = P$

Solution:

i. Here, $U = \{1, 2, 3, 7, 8, 9, 10, 11, 12\}$ $P = \{1, 3, 7, 10\}$

$\therefore P' = \{2, 8, 9, 11, 12\}$



II. Here, $U = \{1, 2, 3, 7, 8, 9, 10, 11, 12\}$

$P = \{1, 3, 7, 10\}$ (i)

$\therefore P' = \{2, 8, 9, 11, 12\}$

Also, $(P')' = \{1, 3, 7, 10\}$... (ii)

$\therefore (P')' = P$... [From (i) and (ii)]

Question 4.

$A = \{1, 3, 2, 7\}$, then write any three subsets of A.

Solution:

Three subsets of A:

i. $B = \{3\}$

ii. $C = \{2, 1\}$

iii. $D = \{1, 2, 7\}$

[Note: The above problem has many solutions. Students may write solutions other than the ones given]

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Question 5.

i. Write the subset relation between the sets.

P is the set of all residents in Pune.

M is the set of all residents in Madhya Pradesh.

I is the set of all residents in Indore.

B is the set of all residents in India.

H is the set of all residents in Maharashtra.

ii. Which set can be the universal set for above sets ?

Solution:

i.

a. The residents of Pune are residents of India.

$$\therefore P \subseteq B$$

b. The residents of Pune are residents of Maharashtra.

$$\therefore P \subseteq H$$

c. The residents of Madhya Pradesh are residents of India.

$$\therefore M \subseteq B$$

d. The residents of Indore are residents of India.

$$\therefore I \subseteq B$$

e. The residents of Indore are residents of Madhya Pradesh.

$$\therefore I \subseteq M$$

f. The residents of Maharashtra are residents of India.

$$\therefore H \subseteq B$$

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ii. The residents of Pune, Madhya Pradesh, Indore and Maharashtra are all residents of India.

$\therefore$ B can be the Universal set for the above sets.

Question 6.

Which set of numbers could be the universal set for the sets given below?

i. A = set of multiples of 5,

B = set of multiples of 7,

C = set of multiples of 12

ii. P = set of integers which are multiples of 4.

T = set of all even square numbers.

Answer:

i. A = set of multiples of 5

$\therefore A = \{5, 10, 15, \dots\}$

B = set of multiples of 7

$\therefore B = \{7, 14, 21, \dots\}$

C = set of multiples of 12

$\therefore C = \{12, 24, 36, \dots\}$

Now, set of natural numbers, whole numbers, integers, rational numbers are as follows:

$N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, 3, \dots\}$

$I = \{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

$Q = \{pq \mid p, q \in I, q \neq 0\}$

Since, set A, B and C are the subsets of sets N, W, I and Q.

$\therefore$ For set A, B and C we can take any one of the set from N, W, I or Q as universal set.

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ii. **P = set of integers which are multiples of 4.**

$$P = \{4, 8, 12, \dots\}$$

$$T = \text{set of all even square numbers } T = \{2^2, 4^2, 6^2, \dots\}$$

Since, set P and T are the subsets of sets N, W, I and Q.

$\therefore$ For set P and T we can take any one of the set from N, W, I or Q as universal set.

Question 7.

Let all the students of a class form a Universal set. Let set A be the students who secure 50% or more marks in Maths. Then write the complement of set A.

Answer:

Here, U = all the students of a class.

A = Students who secured 50% or more marks in Maths.

$\therefore$ A' = Students who secured less than 50% marks in Maths.

Question 1.

If A = {1, 3, 4, 7, 8}, then write all possible subsets of A.

$$\text{i. e. } P = \{1, 3\}, T = \{4, 7, 8\}, V = \{1, 4, 8\}, S = \{1, 4, 7, 8\}$$

In this way many subsets can be written. Write five more subsets of set A. (Textbook pg. no, 8)

Answer:

$$B = \{ \},$$

$$E = \{4\},$$

$$C = \{1, 4\},$$

$$D = \{3, 4, 7\},$$

$$F = \{3, 4, 7, 8\}$$

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Question 2.

Some sets are given below.

$$A = \{\dots, -4, -2, 0, 2, 4, 6, \dots\}$$

$$B = \{1, 2, 3, \dots\}$$

$$C = \{\dots, -12, -6, 0, 6, 12, 18, \dots\}$$

$$D = \{\dots, -8, -4, 0, 4, 8, \dots\}$$

$$I = \{\dots, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$$

Discuss and decide which of the following statements are true.

- a. A is a subset of sets B, C and D.
- b. B is a subset of all the sets which are given above. (Textbook pg. no. 9)

Solution:

- a. All elements of set A are not present in set B, C and D.

$$\therefore A \not\subseteq B,$$

$$\therefore A \not\subseteq C,$$

$$\therefore A \not\subseteq D$$

$\therefore$ Statement (a) is false.

- b. All elements of set B are not present in set A, C and D.

$$\therefore B \not\subseteq A,$$

$$\therefore B \not\subseteq C,$$

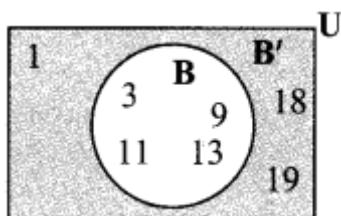
$$\therefore B \not\subseteq D$$

$\therefore$ Statement (b) is false.

Question 3.

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Suppose $U = \{1, 3, 9, 11, 13, 18, 19\}$, and $B = \{3, 9, 11, 13\}$. Find $(B')'$ and draw the inference. (Textbook pg. no. 10)



Solution:

$$U = \{1, 3, 9, 11, 13, 18, 19\},$$

$$B = \{3, 9, 11, 13\} \dots (i)$$

$$\therefore B' = \{1, 18, 19\}$$

$$(B')' = \{3, 9, 11, 13\} \dots (ii)$$

$$\therefore (B')' = B \dots [\text{From (i) and (ii)}]$$

$\therefore$ Complement of a complement is the given set itself.



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Class 9 Maths

Part 1

- Chapter 1.1- Sets
- Chapter 1.2- Sets
- Chapter 1.3- Sets
- Chapter 1.4- Sets
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- Chapter 2.2- Real Numbers
- Chapter 2.3- Real Numbers
- Chapter 2.4- Real Numbers
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- Chapter 5.1- Linear Equations in Two Variables
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- Chapter 6.1- Financial Planning
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- Chapter 7.5- Statistics

About About Maharashtra State Board (MSBSHSE)

The Maharashtra State Board of Secondary and Higher Secondary Education or MSBSHSE (Marathi: महाराष्ट्र राज्य माध्यमिक आणि उच्च माध्यमिक शिक्षण मंडळ), is an **autonomous and statutory body established in 1965**. The board was amended in the year 1977 under the provisions of the Maharashtra Act No. 41 of 1965.

The Maharashtra State Board of Secondary & Higher Secondary Education (MSBSHSE), Pune is an independent body of the Maharashtra Government. There are more than 1.4 million students that appear in the examination every year. The Maha State Board conducts the board examination twice a year. This board conducts the examination for SSC and HSC.

The Maharashtra government established the Maharashtra State Bureau of Textbook Production and Curriculum Research, also commonly referred to as Ebalbharati, in 1967 to take up the responsibility of providing quality textbooks to students from all classes studying under the Maharashtra State Board. MSBHSE prepares and updates the curriculum to provide holistic development for students. It is designed to tackle the difficulty in understanding the

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concepts with simple language with simple illustrations. Every year around 10 lakh students are enrolled in schools that are affiliated with the Maharashtra State Board.

FAQs

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As of now, the MSCERT and Balbharti are responsible for the syllabus and textbooks of Classes 1 to 8, while Classes 9 and 10 are under the Maharashtra State Board of Secondary and Higher Secondary Education (MSBSHSE).

How many state boards are there in Maharashtra?

The Maharashtra State Board of Secondary & Higher Secondary Education, conducts the HSC and SSC Examinations in the state of Maharashtra through its nine Divisional Boards located at Pune, Mumbai, Aurangabad, Nasik, Kolhapur, Amravati, Latur, Nagpur and Ratnagiri.

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