

SAMPLE CONTENT

PART - I



MATHEMATICS

WORKBOOK

BASED ON TEXTBOOK AND BOARD PAPER PATTERN

Application of Ratio and Proportion:

$$\frac{\text{Dimension of the actual building}}{\text{Dimension of the model}} = \text{Constant}$$



STD. IX
(Eng. Med.)

Target Publications® Pvt. Ltd.

Mathematics Part – I

WORKBOOK

STD. IX (English Medium)

Salient Features

- ⇒ Includes all textual Problem Sets
- ⇒ Covers all Intext and Activity/Project based questions from the textbook
- ⇒ Includes adequate space to write the answers
- ⇒ Tentative marks allocation for all problems
- ⇒ Includes Smart Recap at the end of the relevant chapters

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PREFACE

Target's "**Mathematics Part - I Workbook: Std. IX**" is an excellent resource for students seeking to enhance their preparation for examinations.

Our basic premise for this book is to retain the outline of the content as textbook to facilitate students to keep their practice material together and have a single point of reference for revision.

The book includes Smart Recap at the end of the relevant chapters as quick revision tool for the solving problems.

Tentative marks have also been allocated to the questions. However, marks mentioned are indicative and are subject to change as per Maharashtra state board's discretion.

A book affects eternity; one can never tell where its influence stops.

Best of luck to all the aspirants!

Publisher

Edition: First

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we've nearly missed something or want to applaud us for our triumphs, we'd love to hear from you.

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Disclaimer

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Sample Content

Let's Learn

Example:

Fill in the blanks given in the following table.

(Textbook pg. no. 3)

Listing or Roster Method	Rule Method or Set builder form
$A = \{2, 4, 6, 8, 10, 12, 14\}$	$A = \{x \mid x \text{ is an even natural number less than } 15\}$
.....	$B = \{x \mid x \text{ is a perfect square number between } 1 \text{ to } 20\}$
$C = \{a, e, i, o, u\}$
.....	$D = \{y \mid y \text{ is a colour in the rainbow}\}$
.....	$P = \{x \mid x \text{ is an integer and } -3 < x < 3\}$
$M = \{1, 8, 27, 64, 125, \dots\}$

 Practice Set 1.1

1. Write the following sets in roster form.

[1 Mark each]

i. Set of even natural numbers

Ans:

.....

ii. Set of even prime numbers from 1 to 50

Ans:

.....

iii. Set of negative integers

Ans:

.....

iv. Seven basic sounds of a sargam (sur)

Ans:

.....



2. Write the following symbolic statements in words.

[1 Mark each]

i. $\frac{4}{3} \in \mathbb{Q}$

Ans:

ii. $-2 \notin \mathbb{N}$

Ans:

iii. $P = \{p \mid p \text{ is an odd number}\}$

Ans:

3. Write any two sets by listing method and by rule method.

[2 Marks]

Ans:

4. Write the following sets using listing method.

[1 Mark each]

i. All months in the Indian solar year.

Ans:

ii. Letters in the word 'COMPLEMENT'.

Ans:

iii. Set of human sensory organs.

Ans:

iv. Set of prime numbers from 1 to 20.

Ans:



v. Names of continents of the world.

Ans:

5. Write the following sets using rule method.

[1 Mark each]

i. $A = \{1, 4, 9, 16, 25, 36, 49, 64, 81, 100\}$

Ans:

ii. $B = \{6, 12, 18, 24, 30, 36, 42, 48\}$

Ans:

iii. $C = \{S, M, I, L, E\}$

Ans:

iv. $D = \{\text{Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday}\}$

Ans:

v. $X = \{a, e, t\}$

Ans:

Let's Learn

Example:

If $A = \{1, 2, 3\}$ and $B = \{1, 2, 3, 4\}$, then $A \neq B$ verify it.

(Textbook pg. no. 6)

Ans:

Example:

$A = \{x \mid x \text{ is prime number and } 10 < x < 20\}$ and $B = \{11, 13, 17, 19\}$. Here $A = B$. Verify.

(Textbook pg. no. 6)

Ans:



3. Which of the following are empty sets? Why? [1 Mark each]

i. $A = \{a \mid a \text{ is a natural number smaller than zero}\}$

Solution:

ii. $B = \{x \mid x^2 = 0\}$

Solution:

iii. $C = \{x \mid 5x - 2 = 0, x \in \mathbb{N}\}$

Solution:

4. Write with reasons, which of the following sets are finite or infinite. [1 Mark each]

i. $A = \{x \mid x < 10, x \text{ is a natural number}\}$

Solution:



ii. $B = \{y \mid y < -1, y \text{ is an integer}\}$

Solution:

iii. $C =$ Set of students of class 9 from your school.

Solution:

iv. Set of people from your village.

Solution:

v. Set of apparatus in laboratory

Solution:

vi. Set of whole numbers

Solution:

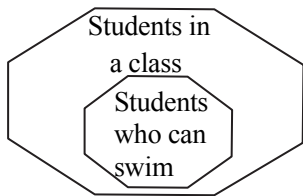
vii. Set of rational number

Solution:



Let's Learn

Activity: Set of students in a class and set of students in the same class who can swim, are shown by the Venn diagram.



Observe the diagram and draw Venn diagrams for the following subsets.

(Textbook pg. no. 8)

- 1. i. Set of students in a class
- ii. Set of students who can ride bicycles in the same class

Ans:

- 2. A set of fruits is given as follows.
{guava, orange, mango, jackfruit, chickoo, jamun, custard apple, papaya, plum}

Show these subsets.

- i. fruit with one seed
- ii. fruit with more than one seed.

Ans:



Practice Set 1.3

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? [1 Mark each]

i. $C \subseteq B$

Ans:

ii. $A \subseteq D$

Ans:

iii. $D \subseteq B$

Ans:

iv. $D \subseteq A$

Ans:

v. $B \subseteq A$

Ans:

Page no. **11** to **18** are purposely left blank.

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vi. B'

Ans:

vii. $(A \cup B)'$

Ans:

Problem Set – 1

1. Choose the correct alternative answer for each of the following questions. [1 Mark each]

i. $M = \{1, 3, 5\}$, $N = \{2, 4, 6\}$, then $M \cap N = ?$

- (A) $\{1, 2, 3, 4, 5, 6\}$ (B) $\{1, 3, 5\}$ (C) ϕ (D) $\{2, 4, 6\}$

Ans:

ii. $P = \{x \mid x \text{ is an odd natural number, } 1 < x \leq 5\}$. How to write this set in roster form?

- (A) $\{1, 3, 5\}$ (B) $\{1, 2, 3, 4, 5\}$ (C) $\{1, 3\}$ (D) $\{3, 5\}$

Ans:

iii. $P = \{1, 2, \dots, 10\}$. What type of set P is?

- (A) Null set (B) Infinite set (C) Finite set (D) None of these

Ans:

iv. $M \cup N = \{1, 2, 3, 4, 5, 6\}$ and $M = \{1, 2, 4\}$, then which of the following represent set N ?

- (A) $\{1, 2, 3\}$ (B) $\{3, 4, 5, 6\}$ (C) $\{2, 5, 6\}$ (D) $\{4, 5, 6\}$

Ans:

v. If $P \subseteq M$, then which of the following set represent $P \cap (P \cup M)$?

- (A) P (B) M (C) $P \cup M$ (D) $P' \cap M$

Ans:

vi. Which of the following sets are empty sets?

- (A) Set of intersecting points of parallel lines.
 (B) Set of even prime numbers.
 (C) Month of an english calendar having less than 30 days.
 (D) $P = \{x \mid x \in I, -1 < x < 1\}$

Ans:

2. Find the correct option for the given question. [1 Mark each]

i. Which of the following collections is a set?

- (A) Colours of the rainbow (B) Tall trees in the school campus.
 (C) Rich people in the village (D) Easy examples in the book

Ans:

ii. Which of the following set represent $N \cap W$?

- (A) $\{1, 2, 3, \dots\}$ (B) $\{0, 1, 2, 3, \dots\}$ (C) $\{0\}$ (D) $\{\}$

Ans:

iii. $P = \{x \mid x \text{ is a letter of the word 'indian'}\}$, then which one of the following is set P in listing form?

- (A) $\{i, n, d\}$ (B) $\{i, n, d, a\}$ (C) $\{i, n, d, i, a\}$ (D) $\{n, d, a\}$

Ans:



- iv. If $T = \{1, 2, 3, 4, 5\}$ and $M = \{3, 4, 7, 8\}$, then $T \cup M = ?$
 (A) $\{1, 2, 3, 4, 5, 7\}$ (B) $\{1, 2, 3, 7, 8\}$ (C) $\{1, 2, 3, 4, 5, 7, 8\}$ (D) $\{3, 4\}$

Ans:

3. Out of 100 persons in a group, 72 persons speak English and 43 persons speak French. Each one out of 100 persons speak at least one language. Then how many speak only English? How many speak only French? How many of them speak English and French both? [4 Marks]

Solution:

Handwriting practice area for question 3, consisting of a grid of horizontal dashed lines and a vertical dashed line down the center.

4. 70 trees were planted by Parth and 90 trees were planted by Pradnya on the occasion of Tree Plantation Week. Out of these 25 trees were planted by both of them together. How many trees were planted by Parth or Pradnya? [2 Marks]

Solution:

Handwriting practice area for question 4, consisting of a grid of horizontal dashed lines and a vertical dashed line down the center.



7. Represent the union of two sets by Venn diagram for each of the following.

i. $A = \{3, 4, 5, 7\}$, $B = \{1, 4, 8\}$

[1 Mark]

Solution:

ii. $P = \{a, b, c, e, f\}$, $Q = \{l, m, n, e, b\}$

[1 Mark]

Solution:

iii. $X = \{x \mid x \text{ is a prime number between } 80 \text{ and } 100\}$
 $Y = \{y \mid y \text{ is an odd number between } 90 \text{ and } 100\}$

[2 Marks]

Solution:

8. Write the subset relations between the following sets.

$X =$ set of all quadrilaterals.

$Y =$ set of all rhombuses.

$S =$ set of all squares.

$T =$ set of all parallelograms.

$V =$ set of all rectangles.

[3 Marks]

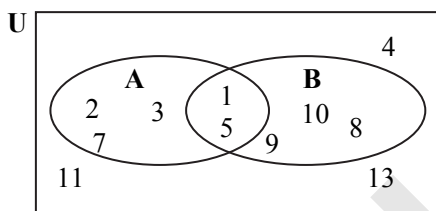
Solution:



9. If M is any set, then write $M \cup \phi$ and $M \cap \phi$. [3 Marks]

Solution:

10. Observe the Venn diagram and write the given sets U , A , B , $A \cup B$ and $A \cap B$. [2 Marks]



Ans:

11. If $n(A) = 7$, $n(B) = 13$, $n(A \cap B) = 4$, then $n(A \cup B) = ?$ [1 Mark]

Solution:



Activity I: Fill in the blanks with elements of that set.

$$U = \{1, 3, 5, 8, 9, 10, 11, 12, 13, 15\}$$

$$A = \{1, 11, 13\}$$

$$B = \{8, 5, 10, 11, 15\}$$

(Textbook pg. no. 18)

$$A' = \dots\dots\dots$$

$$B' = \dots\dots\dots$$

$$A \cap B = \dots\dots\dots$$

$$A' \cap B' = \dots\dots\dots$$

$$A \cup B = \dots\dots\dots$$

$$A' \cup B' = \dots\dots\dots$$

$$(A \cap B)' = \dots\dots\dots$$

$$(A \cup B)' = \dots\dots\dots$$

Verify: $(A \cap B)' = A' \cup B'$, $(A \cup B)' = A' \cap B'$

Activity II: Collect the following information from 20 families nearby your house.

- i. Number of families subscribing for Marathi Newspaper.
- ii. Number of families subscribing for English Newspaper.
- iii. Number of families subscribing for both English as well as Marathi Newspaper.

Show the collected information using Venn diagram.

(Textbook pg. no. 18)

[Students should attempt the above activity on their own.]

Smart Recap

Notations	Read as
N	Natural numbers
W	Whole numbers
I	Integers
Q	Rational numbers
R	Real numbers
=	Equals to
≠	Not equals to
∈	Belongs to
∉	Not belongs to

Notations	Read as
{ }	Curly braces
ϕ	Phi or empty set
or :	Such that
∪	Union
∩	Intersection
⊆	Subset
⊈	Not a subset
A' or A ^c	Complement of set A
U	Universal set

Teacher's Remark:

Date:



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