

SAMPLE CONTENT



Perfect Notes

MATHEMATICS

Build
Powerful
Concepts



STD. VI

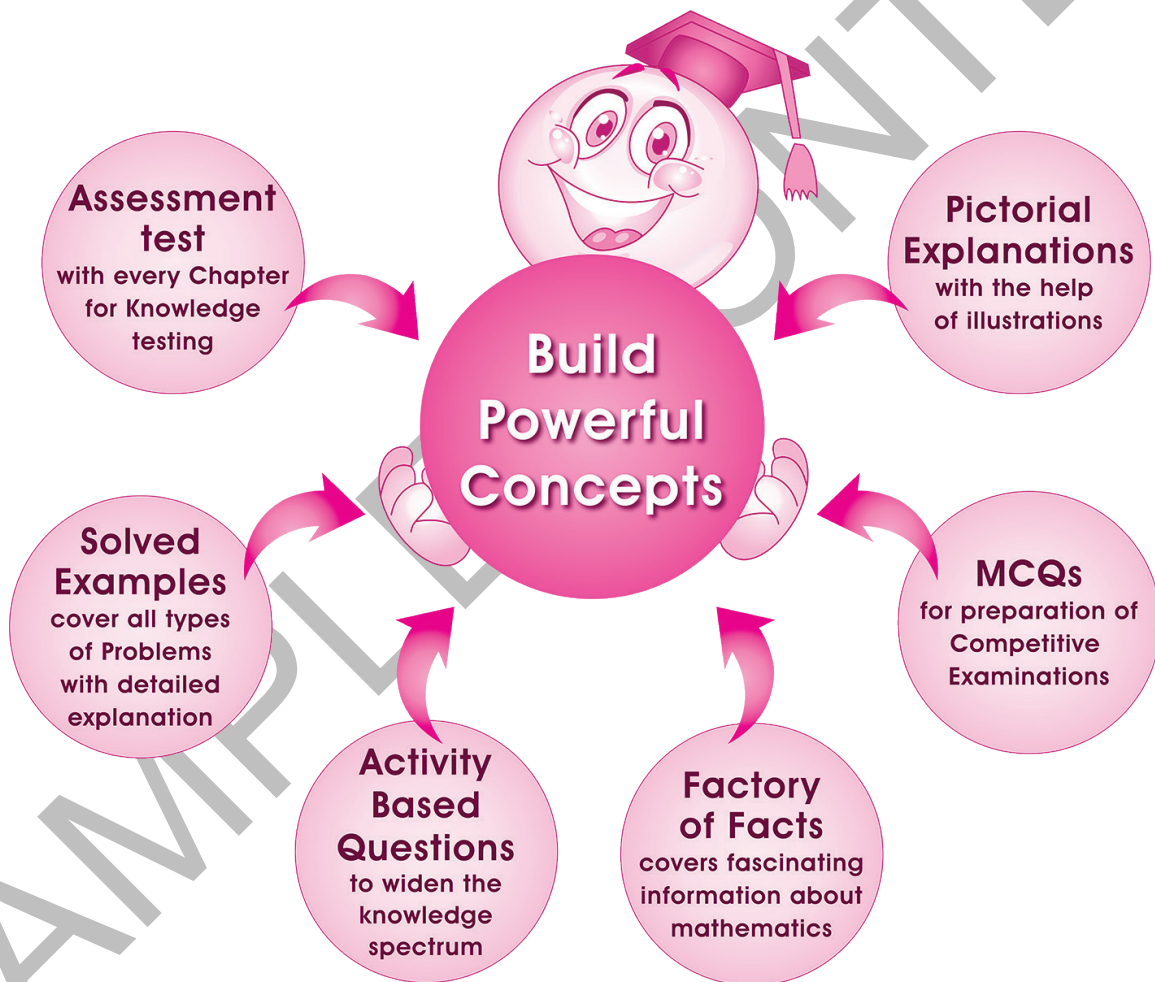
(Eng. Med.)

Target Publications Pvt. Ltd.

Written as per the syllabus prescribed by the Maharashtra State Bureau
of Textbook Production and Curriculum Research, Pune.

STD. VI

Mathematics



Printed at: **Repro India Ltd.**, Mumbai

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PREFACE

Mathematics: Std. VI has been prepared as per the new 'Continuous Comprehensive Evaluation' (CCE) system which is more child-centric and focuses on active learning and making the process of education more enjoyable and interesting.

Preparing this **Mathematics** book was a rollercoaster ride. We had a plethora of ideas, suggestions and decisions to ponder over. However our basic premise was to keep this book in line with the new, improved syllabus and provide students with an absolutely fresh material.

To begin with, let us look at this book as a 'powerful concept building tool'. We want this book to act as a facilitator for students to deeply understand mathematical concepts presented in the class VI book by the Maharashtra State Education Board. The understanding of these concepts would eventually help students, link textual problems with their daily life and comprehend its application for future use.

We've ensured that every chapter begins with a lucid introduction to the topic. Thereon the chapter covers a multitude of solved examples related to the topic. These examples are textual as well external practice problems, so as to reinforce the topic's understanding within the reader.

The part of **Formative Assessment** covers Activity Based Questions from the text book. We've partially solved these questions and added additional ones for practice sake.

Every chapter ends with an **Assessment Test**. This test stands as a testimony to the fact that the child has understood the chapter thoroughly. The **Multiple Choice Questions** included in this test facilitate students to prepare for competitive examinations.

To conclude the chapter we've presented a snippet of interesting mathematical concepts in the form of **Factory of Facts**. This enhances the student's knowledge beyond the textbook material.

With absolute trust in our work, we hope, our holistic efforts towards making this book are paid off if students understand mathematics conceptually rather than just focusing on the problem solving part. This text would definitely act as a reference point for the same.

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.

Please write to us on : mail@targetpublications.org

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

Best of luck to all the aspirants!

From,
Publisher

Edition: Second

Disclaimer

This reference book is transformative work based on textual contents published by Bureau of Textbook. We the publishers are making this reference book which constitutes as fair use of textual contents which are transformed by adding and elaborating, with a view to simplify the same to enable the students to understand, memorize and reproduce the same in examinations.

This work is purely inspired upon the course work as prescribed by the Maharashtra State Bureau of Textbook Production and Curriculum Research, Pune. Every care has been taken in the publication of this reference book by the Authors while creating the contents. The Authors and the Publishers shall not be responsible for any loss or damages caused to any person on account of errors or omissions which might have crept in or disagreement of any third party on the point of view expressed in the reference book.

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1. Basic Concepts in Geometry



Introduction:

The field of Geometry was developed when ancient mathematicians made efforts to measure the earth.

This is how the word Geometry originates.

Phrase: geo + metron = geometry

Meaning: earth + measure = to measure earth (or any other object)

You must have come across dots and lines a numerous times.

We observe them in our daily life in the form of rangoli pattern, computer and board games, the divider lines and zebra crossing painted on road, etc

These dots and lines form the basics of Geometry and the chapter takes us through its occurrence and uses in our daily life.

Summative Assessment



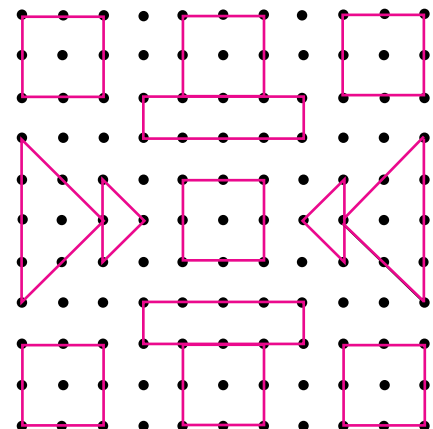
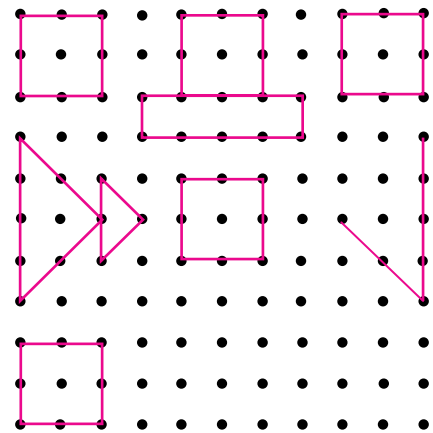
Let's Study

Complete the rangoli. Then, have a class discussion with the help of the following questions:

1. What kind of surface do you need for making a rangoli?
2. How do you start making a rangoli?
3. What did you do in order to complete the rangoli?
4. Name the different shapes you see in the rangoli.
5. Would it be possible to make a rangoli on a scooter or on an elephant's back?
6. When making a rangoli on paper, what do you use to make the dots?

Ans:

1. For making a rangoli, I need a flat surface.
2. I can start making a rangoli by drawing equally spaced dots on the flat surface using a chalk.
3. In order to complete the rangoli, I joined the dots by straight lines to make a design.
4. In the rangoli, I find various shapes such as square, rectangle and triangles of two different size.
5. No. It won't be possible to make a rangoli on a scooter or on an elephant's back as they do not have a flat surface.
6. When making a rangoli on paper, I made use of scale and pencil to make equally spaced dots.





Basic concepts

Sr. No.	Basic concepts	Diagram
1.	Point: A point is an exact position or a particular location on a plane surface represented by a dot. Points are named by using capital letters. M, N and Q are points.	
2.	Line: A line means a straight line which can be extended on both its ends without any limits. Arrow heads are used to show the extended line. A line is named by using small letters like <i>l</i> , <i>m</i> , <i>n</i> etc. or by using two capital letters. Line <i>l</i> or line RS is a line.	
3.	Line Segment: A line segment is a part of a line whose ends are fixed. The endpoints are named by using capital letters. seg AP or seg PA is a line segment.	
4.	Ray: A ray is a part of a line whose one end is fixed while the other is not. The starting point of the ray is called origin and is shown by a point. The other end of the ray is shown by an arrow head. The ray shown in adjacent figure is named as 'ray RS'.	
5.	Concurrent Lines: More than two lines passing through a same point are called concurrent lines. Lines AB, EF, NM, and HG are concurrent.	
6.	Point of Concurrence: The common point through which concurrent lines pass is called point of concurrence. Point P is the point of concurrence.	
7.	Collinear Points: Three or more points which lie on the same straight line are called collinear points. Points A, C, D and B are collinear.	
8.	Non-collinear Points: Points which do not lie on the same line are called non-collinear points. Points P, Q, R, S and T are non-collinear.	
9.	Plane: A flat surface which is a part of an infinite surface is called a plane. Arrows are used to indicate that the plane extends infinitely in all directions. The arrows, however, for convenience are not always used.	
10.	Parallel Lines: Lines which lie in the same plane and do not intersect each other are called parallel lines. Lines <i>l</i> and <i>m</i> are parallel to one another.	



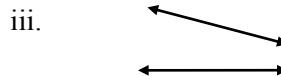
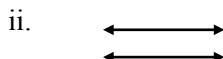
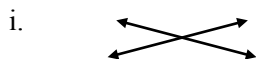
Remember This

- i. Seg RS and seg SR are the same line segments.
- ii. While naming a ray, start from the origin.
- iii. Ray RS is not read as ray SR.
- iv. An infinite number of lines can be drawn through one point.
- v. One and only one line can be drawn through any two distinct points.

**Try This:**

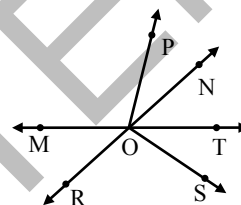
1. Write the proper term, 'intersecting lines' or 'parallel lines' in each of the empty boxes.

(Textbook pg. no. 4)

Ans: **Intersecting Lines****Parallel Lines****Intersecting Lines****Let's Practise : Praticce Set 1**

1. Look at the figure alongside and name the following:

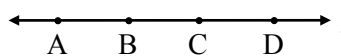
- Collinear points
- Rays
- Line segments
- Lines



Ans:

i.	Collinear Points	Points M, O and T Points R, O and N
ii.	Rays	ray OP, ray OM, ray OR, ray OS, ray OT and ray ON
iii.	Line Segments	seg MT, seg RN, seg OP, seg OM, seg OR, seg OS, seg OT and seg ON
iv.	Lines	line MT and line RN

2. Write the different names of the line.

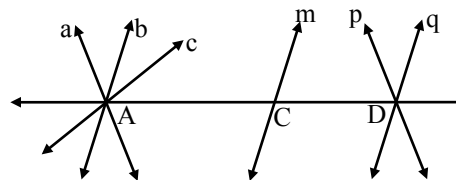
Ans: The different names of the given line are line l , line AB, line AC, line AD, line BC, line BD and line CD.

3. Match the following:

	Group A		Group B
i.		a.	Ray
ii.		b.	Plane
iii.		c.	Line
iv.		d.	Line segment

Ans: (i – c), (ii – d), (iii – b), (iv – a)

4. Observe the given figure. Name the parallel lines, the concurrent lines and the points of concurrence in the figure.



Ans:

Parallel Lines	line b, line m and line q are parallel to each other. line a and line p are parallel to each other.
Concurrent Lines and Point of Concurrence	line AD, line a, line b and line c are concurrent. Point A is their point of concurrence. line AD, line p and line q are concurrent. Point D is their point of concurrence.



Formative Assessment

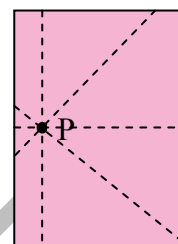


Activity

1. Draw a point on the blackboard. Every student now draws a line that passes through that point. How many such lines can be drawn?

(Textbook pg. no. 2)

Ans: An infinite number of lines can be drawn through one point.

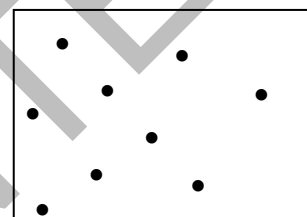


2. Draw a point on a paper and use your ruler to draw lines that pass through it. How many such lines can you draw? (Textbook pg. no. 2)

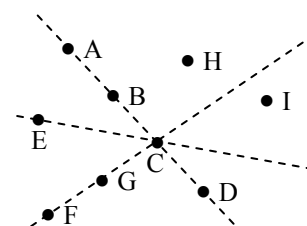
Ans: An infinite number of lines can be drawn through one point.

3. There are 9 points in the figure. Name them. (Textbook pg. no. 3)

- i. If you choose any two points, how many lines can pass through the pair?
- ii. Which three or more of these nine points lie on a straight line?
- iii. Of these nine points, name any three or more points which do not lie on the same line.



- Ans:
- i. One and only one line can be drawn through two distinct points.
 - ii. Points A, B, C and D lie on the same line.
Points F, G and C lie on the same line.
 - iii. Points E, F, G, H and I do not lie on the same line.
points A, B, E, H and I do not lie on the same line.

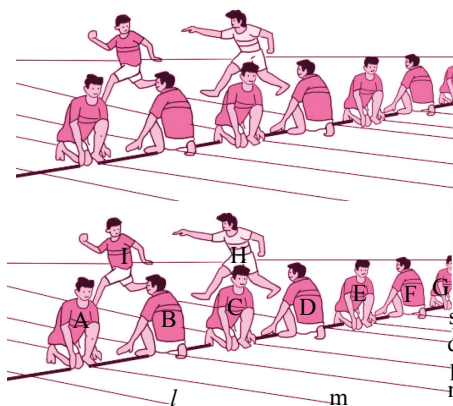


4. Observe the picture of the game being played. Identify the collinear players, non-collinear players, parallel lines and the plane.

(Textbook pg. no. 4)

Ans:

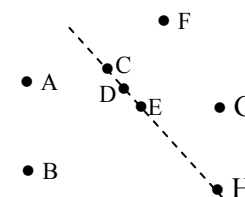
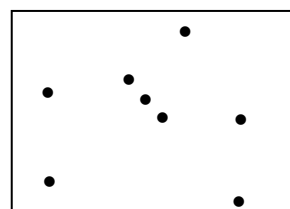
i.	Collinear Players	Players A, B, C, D, E, F, G
ii.	Non-collinear Players	Players I, H, C Players I, A, B etc.
iii.	Parallel Lines	line l , line m , line n , line p , line q , line r and line s
iv.	Plane	The ground on which the boys are playing is the plane



5. In January, we can see the constellation of Orion in the eastern sky after seven in the evening. Then it moves up slowly in the sky. Can you see the three collinear stars in this constellation? Do you also see a bright star on the same line some distance away?

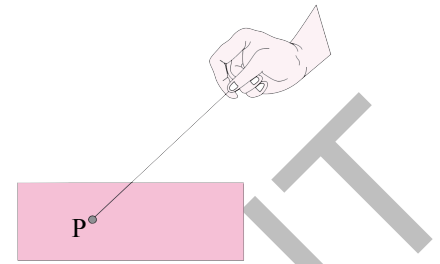
(Textbook pg. no. 4)

- Ans:
- i. The three stars shown by points C, D and E are collinear.
 - ii. The star shown by point H lies on the same line as the stars C, D and E.



**6. Maths is fun! (Textbook pg. no. 5)**

Take a flat piece of thermocol or cardboard, a needle and thread. Tie a big knot or button or bead at one end of the thread. Thread the needle with the other end. Pass the needle up through any convenient point P. Pull the thread up, leaving the knot or the button below. Remove the needle and put it aside. Now hold the free end of the thread and gently pull it straight. Which figure do you see? Now, holding the thread straight, turn it in different directions. See how a countless number of lines can pass through a single point P.



- Ans:** i. The pulled thread forms a straight line.
ii. An infinite number of lines can be drawn through one point.

Assignment Test**1. Choose the correct option for each of the following questions:**

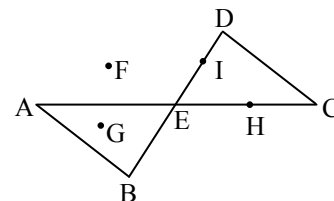
- _____ is used to name a point.

(A) Capital letter	(B) Small letter
(C) Number	(D) Roman numeral
- A line segment has two points showing its limits. They are called _____.

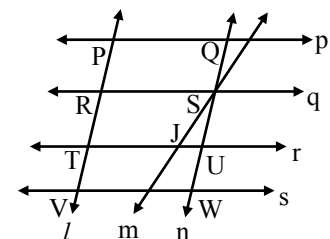
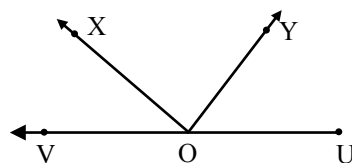
(A) origin	(B) end points
(C) arrow heads	(D) infinite points
- An arrow head is drawn at one end of the ray to show that it is _____ on that side.

(A) finite	(B) ending
(C) infinite	(D) broken
- Lines which lie in the same plane but do not intersect are said to be _____ to each other.

(A) intersecting	(B) collinear
(C) parallel	(D) non-collinear

2. Determine the collinear and non-collinear points in the figure alongside:**3. Look at the figure alongside and answer the questions given below:**

- Name the parallel lines.
- Name the concurrent lines and the point of concurrence.
- Write the different names of line PV.

**4. Name the different line segments and rays in the given figure:**



Answers:

1. i. (A) ii. (B) iii. (C) iv. (C)

2. *Collinear points:*

- i. Points A, E, H and C.
ii. Points B, E, I and D.

Non-collinear points:

Points B, G, F and I

3. i. *Parallel lines:*

- a. line l and line n
b. line p , line q , line r and line s

ii. *Concurrent Lines:*

line q , line m , line n
Point of Concurrence: point S

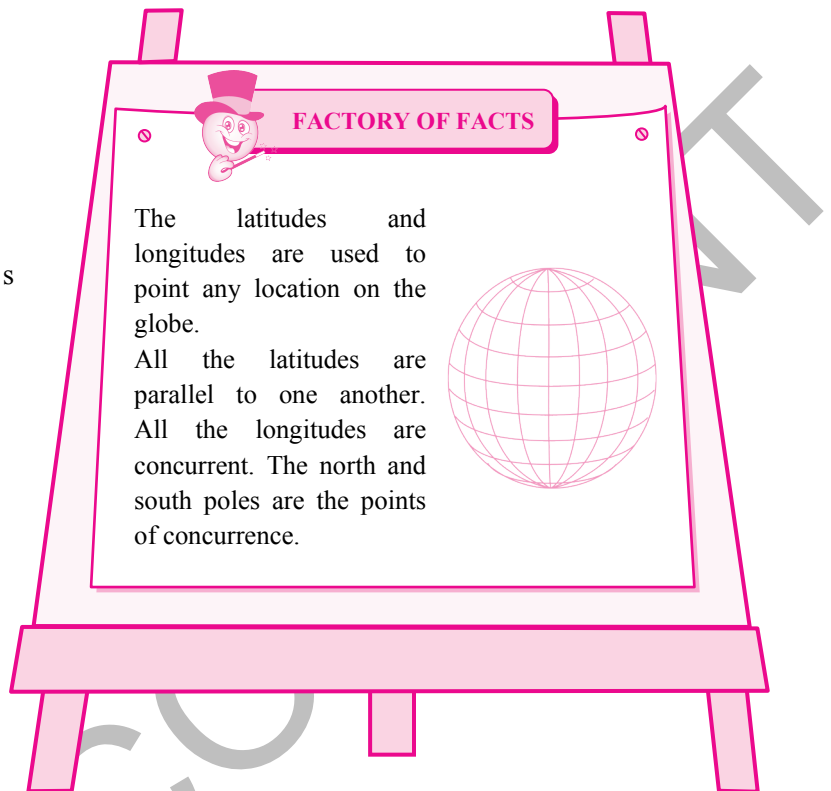
- iii. line l , line PT , line PR ,
line PV , line RT , line RV
and line TV .

4. *Line Segments:*

seg UV , seg OY , seg OX , seg OV
and seg OU

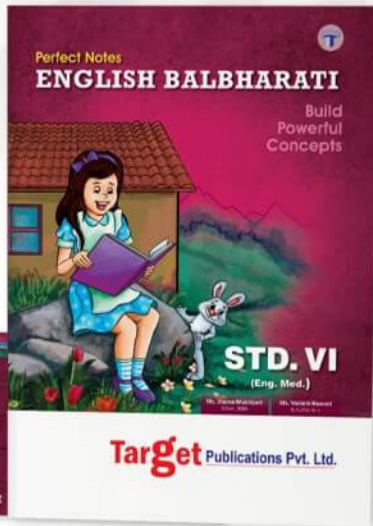
Rays:

ray OV , ray OX , ray OY and
ray UV .





Std. VI



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