Class X

Subject : Mathematics

Chapter : 1

Topic: Real Number

No. Of Days : 06

1. P.K. TESTING:-

This lesson requires knowledge of:
Rational Numbers: Class VIII
Number System: Class IX

2. LEARNING OUTCOME:-

Students will develop the ability to:
- Calculate the HCF of two positive integers.
- Understand The Fundamental Theorem of Arithmetic.
- Express a number as a product of its prime factors to calculate the HCF and LCM of numbers.
- Recall the properties of irrational numbers.
- Prove that if P is prime and P divides a_2, then P divides a, whereas is a positive integer.
- Prove that $\sqrt{2}$, $\sqrt{3}$, $\sqrt{5}$ are irrational numbers

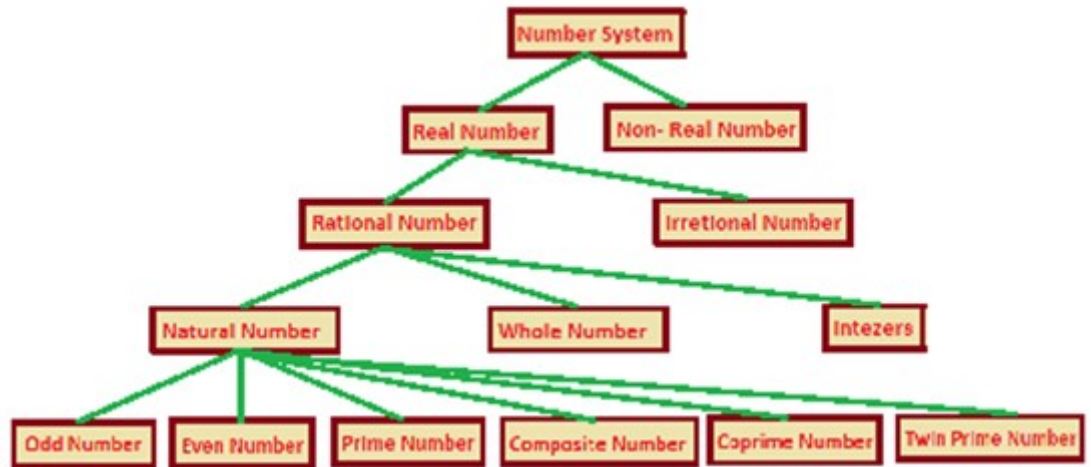## 3. AIDS / INNOVATIVE METHODS USED TO EXPLAIN THE TOPICS:

- Smart board, media links.

4. PEDAGOGICAL STRATEGIES:-

Ppt and Digital Content would be shared

5.   ART INTEGRATION :-
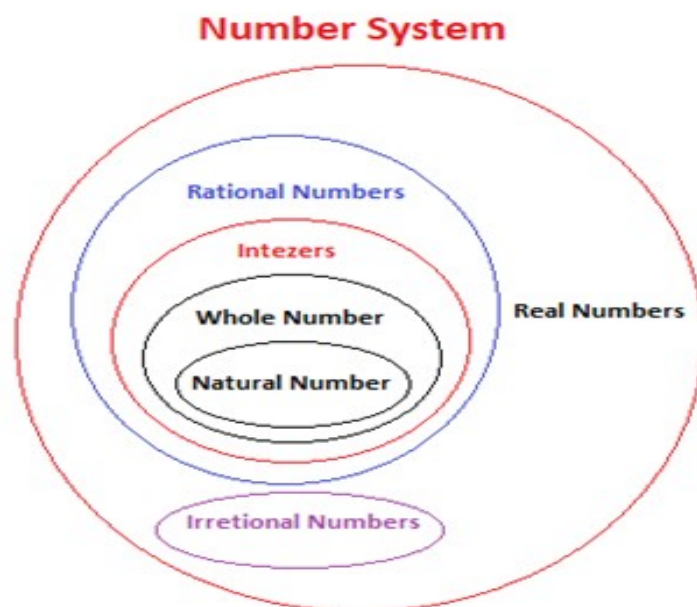Student will be asked to prepare flowchart:

6.   LIFE SKILL:-
Real number is used in everywhere in our day to day life for example.
1. Weighting fruit and vegetables
2. Calculating daily budget for your food and transportation.

7.   FEEDBACK AND REMEDIAL TEACHING
RECAPITULATION :

8.   ASSESSMENT

ASSIGNMENTS:

1. Find the HCF of 52 and 117 and express it in form 52x + 117y.

2. If HCF (6, a) = 2 and LCM (6, a) = 60, then find a.

3. Find the greatest number of 5 digits exactly divisible by 12, 15 and   36.

4. Find the smallest number which when increased by 20 is exactly divisible by 90 and 144.

5. Find the smallest number which leaves remainder 8 and 12 when divided by 28 and 32 respectively.

9.   INCLUSIVE PRACTICE AND FULL PARTICIPATION:-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:

•Encouragement for referring other resources

•Buddy help to be provided

•Provide grade-up classes

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Class X

Subject: Mathematics

Chapter: 2

Topic: Polynomial

No. Of Days: 04

1.   P.K. TESTING:-

This lesson requires:

1. Basic knowledge of polynomials.

2. Knowledge of the polynomial having one term, two terms or three terms.

3. Knowledge of the linear, the quadratic polynomials.

4. Knowledge of zero of the polynomial.

2.   LEARNING OUTCOME:-

Students will develop the ability to:

1. Identify the graphs of given polynomial.

2. Calculate the number of zeroes from the given graph of the polynomial.

3. Find out the zeroes of given quadratic polynomial and Analyze the relationship between zeroes and the coefficients of given polynomial.

4. Frame the probable quadratic polynomial if zeroes of that polynomial are provided through Creative approach of learning.

3.   PEDAGOGICAL STRATEGIES:-

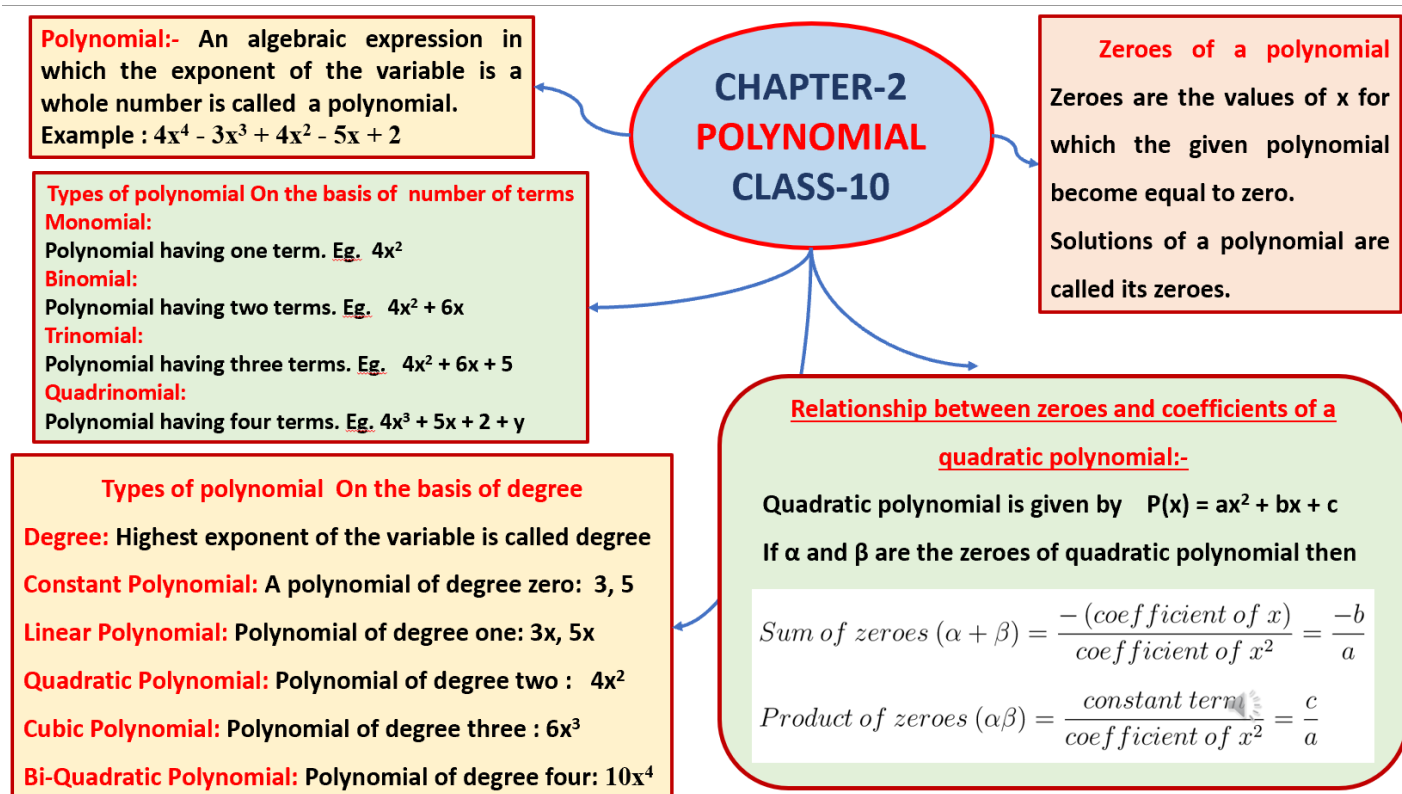Access the videos relevant to the lesson from the library resources.

4.   ART INTEGRATION:-
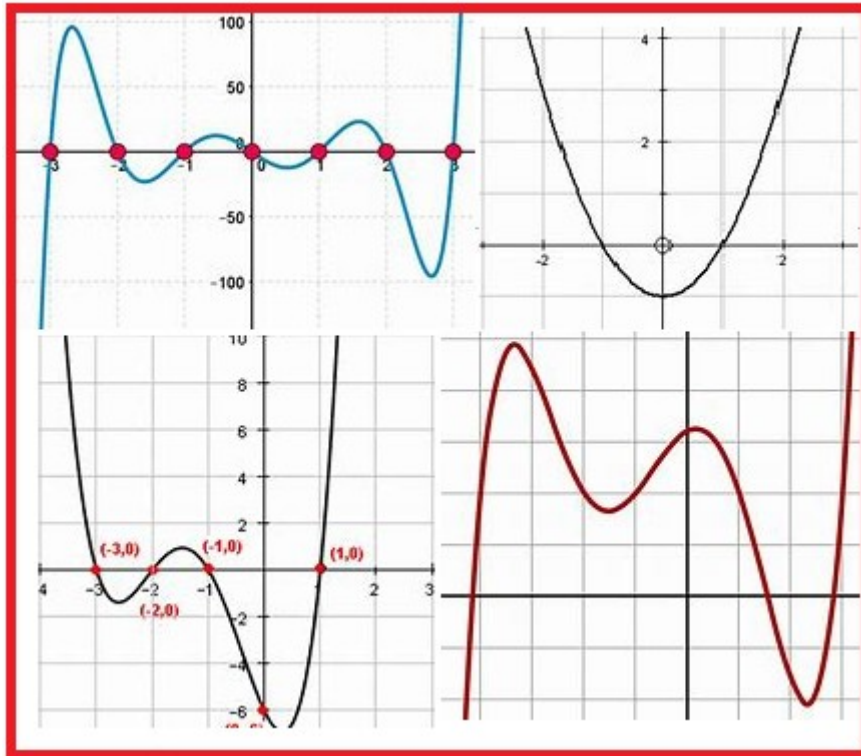
5.   LIFE SKILL:-

◆ Students will be able to analyses the zeroes and factors of polynomials.

◆ Students will be able to analyze effectively and will be able to critically explain the coefficients of quadratic polynomials.

6.　FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Polynomial:- An algebraic expression in which the exponent of the variable is a whole number is called a polynomial.
Example : $4x^4 - 3x^3 + 4x^2 - 5x + 2$

Types of polynomial On the basis of number of terms
Monomial:
Polynomial having one term. Eg. $4x^2$
Binomial:
Polynomial having two terms. Eg. $4x^2 + 6x$
Trinomial:
Polynomial having three terms. Eg. $4x^2 + 6x + 5$
Quadrinomial:
Polynomial having four terms. Eg. $4x^3 + 5x + 2 + y$

Types of polynomial On the basis of degree

Degree: Highest exponent of the variable is called degree

Constant Polynomial: A polynomial of degree zero: 3, 5

Linear Polynomial: Polynomial of degree one: 3x, 5x

Quadratic Polynomial: Polynomial of degree two : $4x^2$

Cubic Polynomial: Polynomial of degree three : $6x^3$

Bi-Quadratic Polynomial: Polynomial of degree four: $10x^4$

CHAPTER-2 POLYNOMIAL CLASS-10

Zeroes of a polynomial
Zeroes are the values of x for which the given polynomial become equal to zero.
Solutions of a polynomial are called its zeroes.

Relationship between zeroes and coefficients of a quadratic polynomial:-

Quadratic polynomial is given by $P(x) = ax^2 + bx + c$

If α and β are the zeroes of quadratic polynomial then

$$Sum\ of\ zeroes\ (\alpha + \beta) = \frac{-(coefficient\ of\ x)}{coefficient\ of\ x^2} = \frac{-b}{a}$$

$$Product\ of\ zeroes\ (\alpha\beta) = \frac{constant\ term}{coefficient\ of\ x^2} = \frac{c}{a}$$

7.　ASSESSMENT
ASSIGNMENTS:

1. If p(x) = 2– 3x + 5, then find p (–2).
• Find a quadratic polynomial whose sum and product of roots are 5, -3.
• If (x + a) is a factor of 2 + 2ax + 5x + 10, find a.
• If α and β are the zeroes of the polynomial x² – 5x + 3 (k – 1) and α – β =11 , find the value of k.

8.　INCLUSIVE PRACTICE AND FULL PARTICIPATION:-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:

For gifted students:
•Encouragement for referring other resources For weak students:
•Buddy help to be provided
•Provide grade-up classes

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Class X

Subject: Mathematics

Chapter: 3

Topic: Pair of Linear Equations in Two Variables

No. Of Days: 14

1. **P.K. TESTING:-**

1. Basic knowledge of linear equations in two variables and their plotting patterns.

2. Knowledge of lines passing through the origin, x axis, y axis

3. Knowledge of parallel to x axis, y axis.

2. **LEARNING OUTCOME:-**

Students would be able to:
1. Understand to represent the algebraic situations algebraically and graphically.
2. Graphical, substitution, elimination methods of solving linear equations.
3. Solving linear equations applicable in daily life.

3. **PEDAGOGICAL STRATEGIES:-**

Inductive Deductive Reasoning, Graphic Organizers, Think pair, share

4. **ART INTEGRATION:-**

Representation of graphs, audio-video aids

5. **LIFE SKILL:-**

Students would be able to critically apply the concepts in given situations and collaboratively solve daily life problem based on the concept.

6. **FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-**

If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, then
Graph : Two intersecting Lines Unique Solution and Consistent

If $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$, then
Graph : Two Co-incident Lines Infinitely Many Solution and Consistent

If $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$, then
Graph : Two Parallel Lines No Solution and Inconsistent

PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

$a_1x+b_1y+c_1 = 0$
$a_2x+b_2y+c_2 = 0$

GRAPHICAL METHOD

SUBSTITUTION METHOD

ELIMINATION METHOD
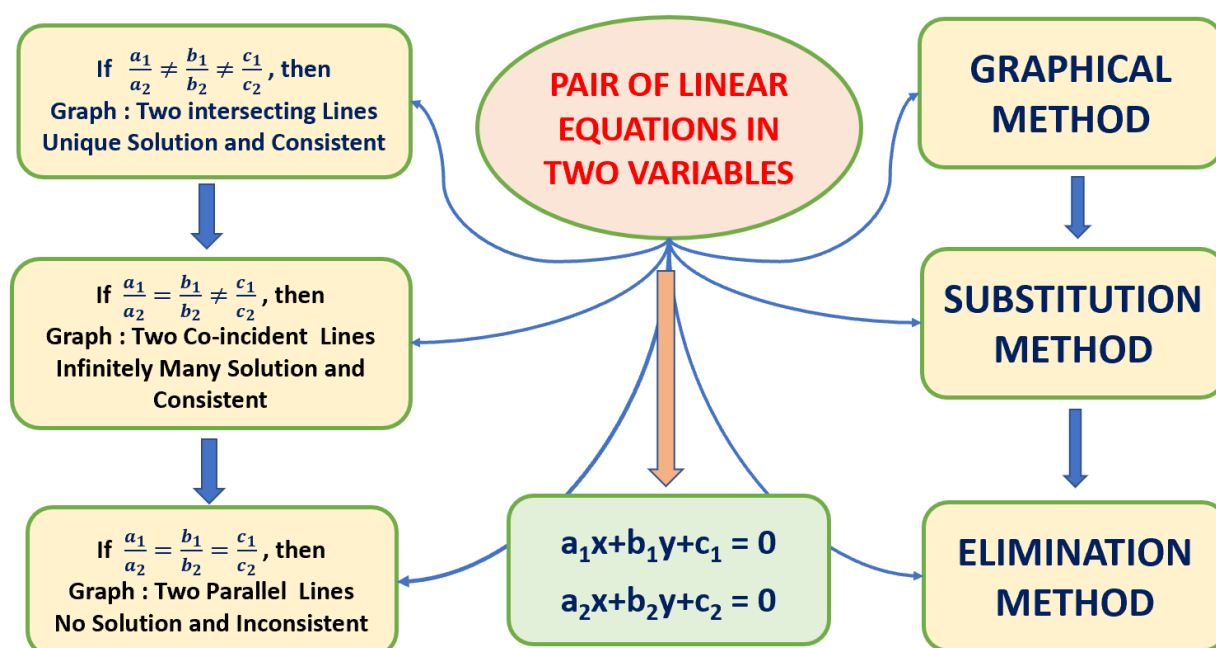
7. **ASSESSMENT ASSIGNMENTS:-**

Q1. Show that the pair of equations 5x-4y = 6, 7x + y = 1. has a unique solution.

Q2. Solve algebraically the pair of equations: x + y = 14, x – y = 4.

Q3. The sum of the digits of a two digit number is 9. If 9 times this number is twice the number obtained by interchanging the digits then find the number.

Q4. Solve the following system of equations graphically and from the graph, find the points where these lines intersect they-axis: x – 2y = 2, 3x + 5y = 17.

Q5. A man travels 300 km partly by train and partly by car. If he covers 60 km by train and rest by car, it takes him 4 hours. But if he travels 100 km by train and rest by car, he takes 10 minutes longer. Find the speed of the train and that of the car separately.

8. INCLUSIVE PRACTICE AND FULL PARTICIPATION:-

Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:
For gifted students:
•Encouragement for referring other
resources For weak students:
•Buddy help to be provided
•Provide grade-up classes

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CLASS X
Ch 4
TOPIC: Quadratic Equations
DURATION: - 10 periods

PRE- REQUISITE KNOWLEDGE:-
• Method of factorizing a quadratic equations class gth.
• Quadratic polynomials chapter 2 class 10th
TEACHING AIDS:-
Green Board, Chalk, Duster, Charts, smart board, laptop, projector etc.
METHODOLOGY:-
Demonstration and Lecture method.
OBJECTIVES:-
• Introduction explanation and definition of quadratic equations.
• Difference between the quadratic equations and quadratic polynomials.
• Relationship between roots and coefficients of quadratic polynomials.
• Method of finding the roots by factor method, by the method of completing the square and by quadratic formulas.
• Discuss the nature of roots by using discriminant.

PROCEDURE:
Start the session by checking their previous knowledge, by asking the questions of quadratic polynomials, its general equation, its degree and zeroes. After this explain the topic to the students.

2)Introduction
Teacher should write the quadratic equation on the board and then explain all the components of quadratic equations like coefficient, variable and constant term.
General Quadratic Equation is :
$gy2 + bx + c=0$ a is the coefficient of x7, b is the coefficient of X, c is the constant term.
Now teacher will introduce the definition of quadratic equations and explain the difference between the quadratic equations and quadratic polynomials.

2)Roots of a Quadratic Equation
Solutions of the quadratic equations are called its roots.
Roots are the values of x for which the given quadratic equation become equal to zero.
Now teacher will explain the relationship between the roots and coefficients of quadratic equations.
Teacher will also explain the method of making the quadratic equation from the roots.
$x^2- Sx + P = 0$

3)Factor Method to solve Q.E.
Now teacher will introduce the factor method of finding the roots of the quadratic equations.
Teacher will also provide sufficient number problems to the students so that students will understand the concept properly.

4)Discriminant and Nature of roots
Now teacher will introduce the Discriminant(D) and explain its relation with the general Q.E.

$D = b^2 - 4ac$

Now teacher will explain the Nature of Roots with different conditions of
D. i.e. for D > 0, D= 0, D <0 and D > 0

LEARNING OUTCOMES:-
After studying this lesson students should know
• All formulas and all important concepts related to the quadratic equations.
• Students should know the nature of solutions by using Discriminant.
• Students should know the factor method, method of completing the squares, and quadratic formula for solving the Q.E.
• Students should also know the method of implementation of these formulas in simple and complex problems

.PEDAGOGICAL STRATEGIES:
Assignment sheet will be given as home work at the end of the topic. Separate sheets which will include questions of logical thinking and Higher order thinking skills will be given to the above average students.
Class
Test
,Oral
Test worksheet
and Assignments can be made the part of assessment.
Re-tests) will be conducted on the basis of the performance of the students in the test.

FEEDBACK AND REMEDIAL TEACHING:-
Class room quiz, discussion of assignments and personal attention to below average students.

RESOURCES INCLUDING ICT:
Students can extend their learning through the RESOURCE CENTRE and can find more valuable and interesting concepts on mathematics at cbsemathematics.com

INCLUSIVE PRACTICES ANDFULL PARTICIPATION
• Students should review the questions given by the teacher.
• Students should prepare the presentation on the different methods of solving quadratic equations.
• Students should Solve the
N.C.E.R.T. problems with examples,
• Students should solve assignment on Multiple Choice Questions
(MCQ) given by the teacher.

CLASS X
CH-5
TOPIC:ARITHMETIC PROGRESSION.

DURATION- 20 Periods

DURATION:-
This chapter is divided into seven modules and it is completed in fifteen class meetings.

PRE- REQUISITE KNOWLEDGE:
Knowledge of number system, Simple methods of calculating the numbers.

TEACHING AIDS:-
Green Board, Chalk, Duster, Charts, smart board, laptop, projector etc.

METHODOLOGY:
Demonstration and Lecture method.

LEARNING OUTCOMES-:
After studying this lesson students should know
• Sequence, Series and Arithmetic Progression.
• All formulas and all important concepts related to the Arithmetic progression.
• Students should be able to find the nth term of the AP from the starting and from the end of the sequences.
• Students should also be able to find the sum to n terms of the AP from the starting and from the end of the sequences.

PEDAGOGICAL STRATEGIES:-
Smart board, Reference books

PROCEDURE:
Start the session by checking their previous knowledge, by asking the questions of number system like natural number, whole number, odd numbers, even numbers and multiples of seven, five etc. After this explain the topic to the students.

Introduction:
Start the session by explaining the terms sequence and series.

Sequence
If different terms are separated by commas then it is called sequence
Example: 2, 5, 7, 9, 11, 12, …

Series:
If different terms are separated by 6+" or 6_6 then it is called series.
Example: 2+5 + 7+9 + 11 + 12 +...

Arithmetic Progression:
Now teacher will introduce the concept of Arithmetic Progression(AP), to the students.

Teacher may write few sequences on the board and explain the difference between the A.P. and the other sequences.

General or nth Term of an AP
Now teacher will write general A.P. on the board and explain its term and common difference.

a, a + d, a + 2d, a + 3d, ... a +
(n - 1)d
With the help of these terms find the formula for general term of an
A.P.
an or th= a + (n - 1)d

Where:
a is the first term,
n is the number of terms
d is the common difference.
Teacher will also help the students in the implementation of this formula in different problems.

General Term from the end of the AP sequence
Now teacher will explain the method of finding the general terms of an AP from the end of the sequence. The formula derived is given below

an or tn= l- (n-1)d

Where:
l is the last term of the sequence
n is the number of terms
d is the common difference
Students should be given sufficient number of problems for practice and implementation of the formula.

Sum to n terms of an AP
Now teacher will introduce the formula for finding sum to n terms of an AP and explain its components and the derivation.

$$S_n = \frac{n}{2} \left[2a + (n - 1)d \right]$$

$$S_n = \frac{n}{2} \left[a + l \right]$$

Where:
a is the first term
n is the number of terms
d is the common difference
l is the last term

Teacher will assign sufficient number of problems to the students for practice

ART INTEGRATION-:

[B] Consider a sequence 1, 4, 8, 10, 11.

1. Take different colour strips of lengths 1 cm, 4 cm, 8 cm, 10 cm, 11 cm and all of the same width 1 cm (say).
2. Arrange and paste these strips in order on a graph paper as shown in fig. (ii).
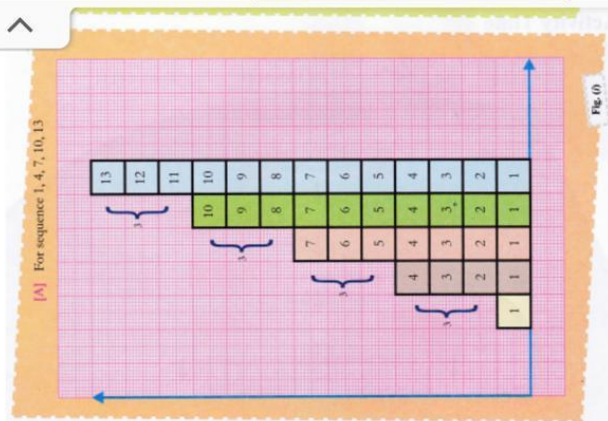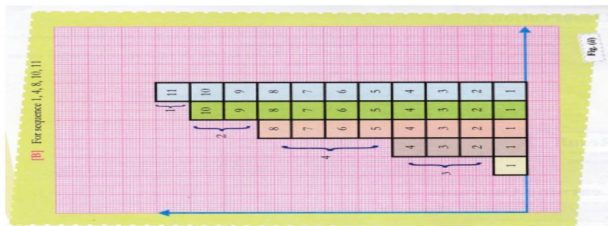
Observation

We observe from fig(i) that the adjoining strips have a common difference in heights i.e. 3 cm and a ladder is formed in which the adjoining steps are constant. Hence it is an arithmetic progression.

In fig (ii) the adjoining strips don't have a common difference in heights and thus the adjoining steps of ladder are not constant. Hence it is not an arithmetic progression.

	fig. (i)	fig. (ii)
Observation	There is a common difference in heights i.e. 3 cm	Don't have common difference in heights
Result	It is an AP.	Not an AP.

Result

Sequence [A] is an AP because common difference between the term and its predecessor remains constant.

Sequence [B] is not an AP because common difference between the term and its predecessor does not remain constant.

Learning Outcome

Students will learn the meaning of an arithmetic progression by relating it to an activity that involves visualisation.

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FEEDBACK AND REMEDIAL TEACHING:-

• Review questions given by the teacher.
• Students should prepare the presentation on the derivation of the formula for finding the nth term of the sequence and the formula for finding the sum to n terms from the starting and end of the sequence.
• Solve N.C.E.R.T. problems with examples.
• Solve assignment on Multiple
Choice Questions (MCQ) given by the teacher.

RESOURCES INCLUDING ICT:-

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INCLUSIVE PRACTICES AND FULL PARTICIPATION:-

Assignment sheet will be given as home work at the end of the topic. Separate sheets which will include questions of logical thinking and Higher order thinking skills will be given to the above average students.

Class Test, Oral Test , worksheet and Assignments can be made the part of assessment. Re-tests) will be conducted on the basis of the performance of the students in the test.

CLASS X (MATHEMATICS)

No. Of days required=6 to 7   Chapter -6
(Triangles)

LEARNING OBJECTIVES: Students will be able

- ➤ To develop a positive attitude and a liking for mathematics.
- ➤ To make necessary connections between mathematics and everyday thinking.
- ➤ To develop willingness to work in collaboration.
- ➤ To appreciate the role, value and use of mathematics in society.

SPECIFIC OBJECTIVES: Students will be able

- ➤ To define the term 'similar figures'.
- ➤ To explain the condition of similarity for two polygons with the same number of sides. .
- ➤ To explain AAA, AA, SSS and SAS similarity criterion.
- ➤ To prove the basic proportionality Theorem and Pythagoras theorem.

EXPECTED OUTCOMES:

- ➤ Students will be able to identify plane figures which have the same shapes and angles but sides are in certain ratio.
- ➤ Students will be able to determine similarity of triangles by AAA, SAS, SSS and RHS.
- ➤ Students will be able to apply the Pythagoras theorem and its converse.
- ➤ Students will be able to apply the basic proportionality theorem and its converse

INTRODUCTION:-

Teacher will start the lesson with P.K. Testing. To test the previous knowledge teacher will ask the following question

- ➤ What is triangle?
- ➤ What is scalene triangle?
- ➤ What is right angled triangle?

- ➢ What is an equilateral triangle?
- ➢ What do you mean by congruent
- ➢ What are the rules of congruence?
- ➢ All equilateral triangles are congruent or not?

Introduction

Similar Figures:-

Two figures having the same shape but necessarily the same size are called similar figures.

Similarity of Triangles:-

Two triangles are similar if their corresponding angles are equal and corresponding sides are proportional.
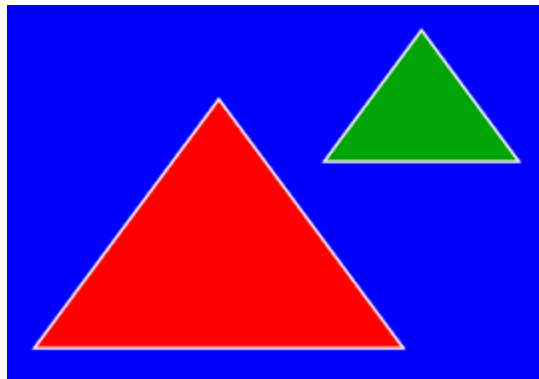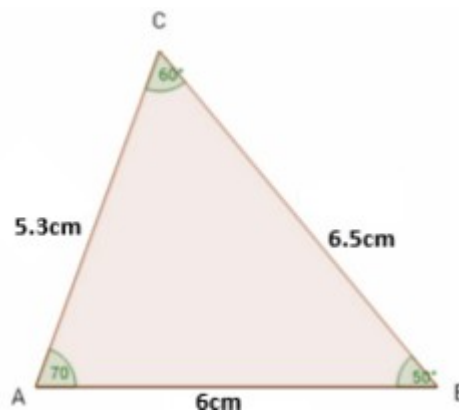

Similarity condition of triangles:-

Triangles can be made similar with the help of four conditions **SSS, SAS, AAA and AA** conditions.

Pedagogical Strategies

ACTIVITY 1:-

The teacher will draw the following figure on the board.

The teacher will ask the students to draw a triangle that is Similar to triangle ABC.

Next, the teacher will give the following instructions:

You will all start by drawing a line segment that has the same length as the side AB.

Then you will think about how many sides and angles you need to know in order to draw a triangle similar to triangle ABC. You have ten minutes to work on this problem. Use your rulers, compasses and protractors. Next, the teacher will discuss with the class how they decided where the third vertex of the triangle should be placed. The teacher will discuss the following points:

> If in two triangles, corresponding sides are in same ratio, then their corresponding angles are equal the two triangles must be similar. (SSS similarity criterion) .

> If in two triangles, corresponding angles are equal then their corresponding sides are in the same ratio and hence the two triangles are similar (AAA similarity criterion).

> If in two triangles, two angles of one triangle are respectively equal to the two angles of the other triangles, then the two triangles are similar (AA similarity criterion).

> If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are in the same ratio, then the triangles are similar (SAS similarity criterion).

ACTIVITY 2:-

The teacher will divide the class into groups and distribute sheets with the following pairs of triangles printed on them. The teacher would then ask the students to identify the type of similar which can be used to prove the two triangles similar. Students have to attempt this along with their partners and give reasons. The teacher would ask volunteers to come at the board and discuss for each pair

The teacher will divide the class into groups and distribute sheets with the following pairs of triangles printed on them. The teacher would then ask the students to identify the type of congruence which can be used to prove the two triangles congruent. Students have to attempt this along with their partners and give reasons. The teacher would ask volunteers to come at the board and discuss for each pair
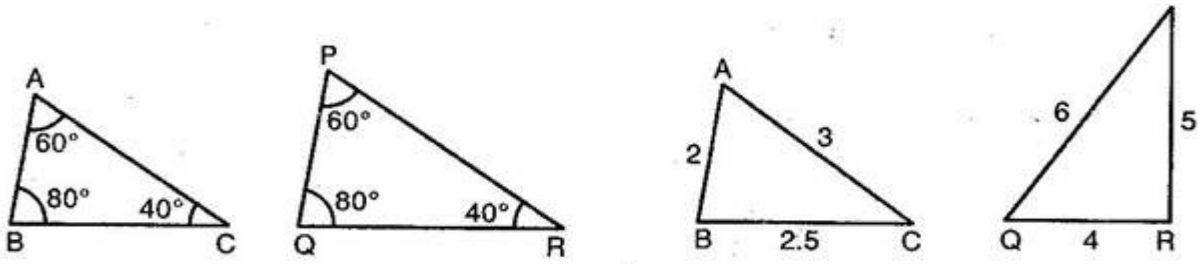
(i)

(ii)
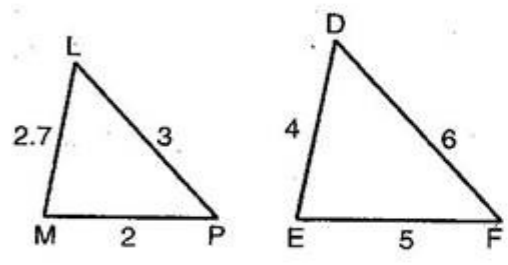
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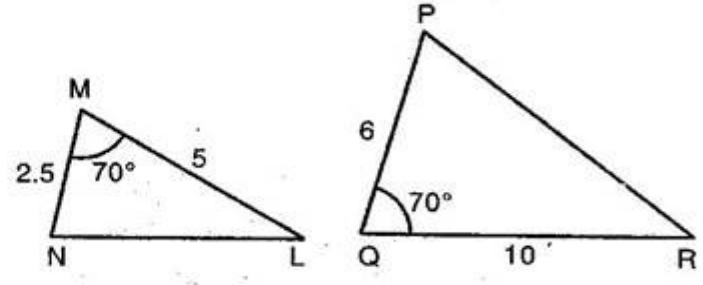
(iv)

- After finishing the activity, students will fill the words in the "L" column of KWL chart that they have learnt from that activity.
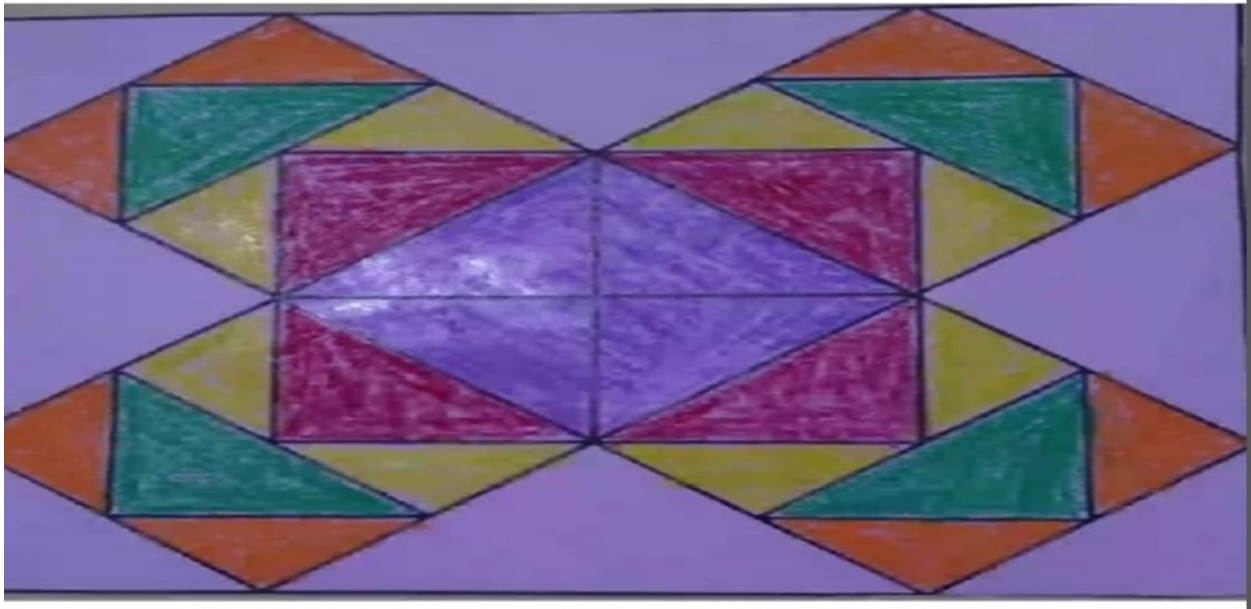
Art Integration Activity-

Warli Painting

Triangular Toran

Rangometry – Creative Rangoli

GROUP ACTIVITY –

Teacher will tell the students to prepare the Power Point Presentation on Similar Triangles in group of 5 students.

REFLECTION UPON THE ACTIVITY:

➤ After the completion of the above activity, students will be asked what they have learnt.
➤ Students will narrate their learning experience.
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IMMEDIATE FEEDBACK:

Peer discussion will be conducted in the form of pair-think-share.

Exploring and research- Ask the learners to read about the relationships between the measures of angles and the lengths of sides in triangles. Also, ask them to research on how the properties of triangles help in their construction.

SUBJECT INTEGRATION

ART & CRAFT: Students will make activity using craft paper, graph paper and coloured sheets.

IT: - Prepare PPT on Similar Triangles using transitions and Animation.

MATHEMATICS: understand different properties of triangle.

APPLICATION OF TRIANGLES IN REAL LIFE

SKILL DEVELOPED: Observation skills, Analysis, Critical thinking, Team work, and Interpersonal skills.

Home work/Assignments

1. Work Exercise from the NCERT
2. Extra practice Assignment from The Exemplar.

TEACHING AIDS: Green board, chalk, duster, charts, smart board, etc.

ASSESSMENT TECHNIQUE S: Class test, oral discussion, oral test, worksheets and assignments of extra questions.

REFERENCE:

 ➢ NCERT BOOK
 ➢ ICT(video related to the topic)
 ➢ Teachers resource from CBSE

Extension of Topic: - Triangles possess a number of key advantages that make them ideal for both architects and curious students: these shapes are incredibly common, structurally sound, and easy to apply and use in everyday life. Students can see the use of triangles in traffic signs, pyramids, staircase, buildings, monuments and towers etc.

Remedial teaching…

For week students buddy help will be provided.and for other students MCQ questions,case study,hot questions will also be shared from other resources and Exampler book

Class X
Subject : Mathematics
Chapter : 7
Topic : Coordinate Geometry

1. P.K. Testing :-
1. Basic knowledge of x-axis and y-axis.
2. Knowledge of how to locate a point.
3. Concepts of Cartesian geometry

2. LEARNING OUTCOME :-
Students will develop the ability to understand
1. The Cartesian/co-ordinate plane.
2. The co-ordinate axes.
3. Distance formula and its application in different problems
4. Section formula, mid point formula and related problems

3. PEDAGOGICAL STRATEGIES :-
The class will start with a discussion on what the students have already learnt in the previous classes and hence what is it that they will learn now. They will also be told the significance of the topic that they will be studying.

Experiential Learning:
Activity based on finding distance from a town A to town B

4. ART INTEGRATION :-
Graph Sheets, Audio Visual aids
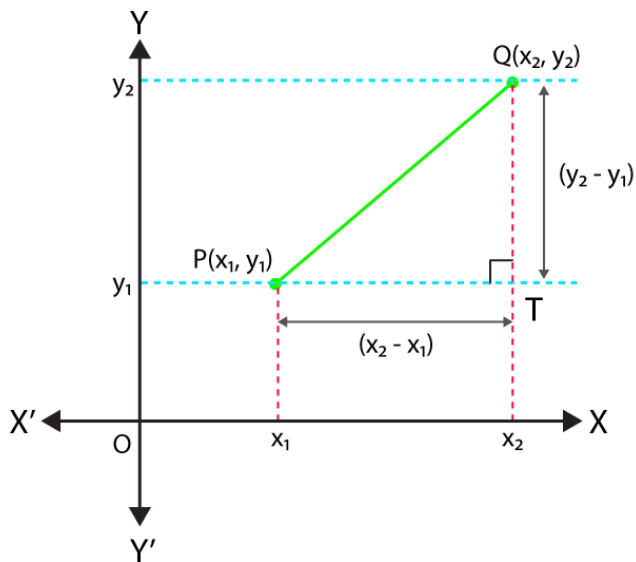
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$$PQ = \sqrt{[(x_2-x_1)^2 + (y_2-y_1)^2]} \text{ OR } (PQ)^2 = (x_2-x_1)^2 + (y_2-y_1)^2$$

Distance Formula

$$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$
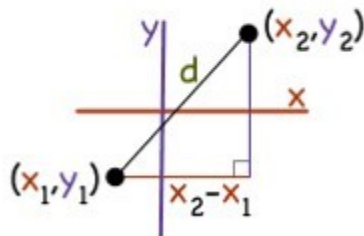
5. LIFE SKILL
Students will be able to
1. Locate the centroid of a triangle with given vertices.
2. Write the co-ordinates of the given point and find the distance between them.
3. Mid point of a given line.

ASSESMENT:

Q. 1: Find the distance of the point P (2, 3) from the x-axis.
Q. 2: Find a relation between x and y such that the point (x, y) is equidistant from the points (7, 1) and (3, 5).

Q. 3: Find the coordinates of the points of trisection (i.e., points dividing into three equal parts) of the line segment joining the points A(2, – 2) and B(– 7, 4).

Q. 4: Find the value of k if the points A(2, 3), B(4, k) and C(6, –3) are collinear.

Q.5: If the point C(-1, 2) divides internally the line segment joining A(2, 5) and B(x, y) in the ratio 3 : 4, find the coordinates of B.

REMEDIAL TEACHING:

The assignments will be given in groups. The students will discuss the problems with each other and they will learn from peer group.

INCLUSIVE PRACTIC AND FULL
PARTICIPATION :-
The following techniques can be used for various groups:
For gifted students:
•Encouragement for referring other resources
For weak students:
•Buddy help to be provided
•Provide grade-up classes

CLASS X (MATHEMATICS)Number of days....6

Chapter 8 (Trigonometry)

LEARNING OBJECTIVES: Students will be able

- ➢ To develop a positive attitude and a liking for mathematics.
- ➢ To make necessary connections between mathematics and everyday thinking.
- ➢ To develop willingness to work in collaboration.
- ➢ To appreciate the role, value and use of mathematics in society.

SPECIFIC OBJECTIVES: Students will be able

- ➢ To define the term 'Trigonometry'.
- ➢ To define the trigonometric ratios.
- ➢ To define the relationship between trigonometric ratios.
- ➢ To define the range of trigonometric ratios.
- ➢ To learn trigonometric Identities.

EXPECTED OUTCOMES:

- ➢ Students will be able to recite the trigonometric ratios of an acute angle of a right angled triangle.
- ➢ Students will be able to work out the trigonometric ratios of specific angles such as 0^0, 30^0, 45^0, 60^0 and 90^0.
- ➢ Students will be able to use different trigonometric identities to solve questions.

INTRODUCTION:-

Teacher will start the lesson with P K Testing. To test the previous knowledge teacher will ask

the following question

- ➢ What do you mean by right angled triangle?
- ➢ How many right angles in right angled triangle?
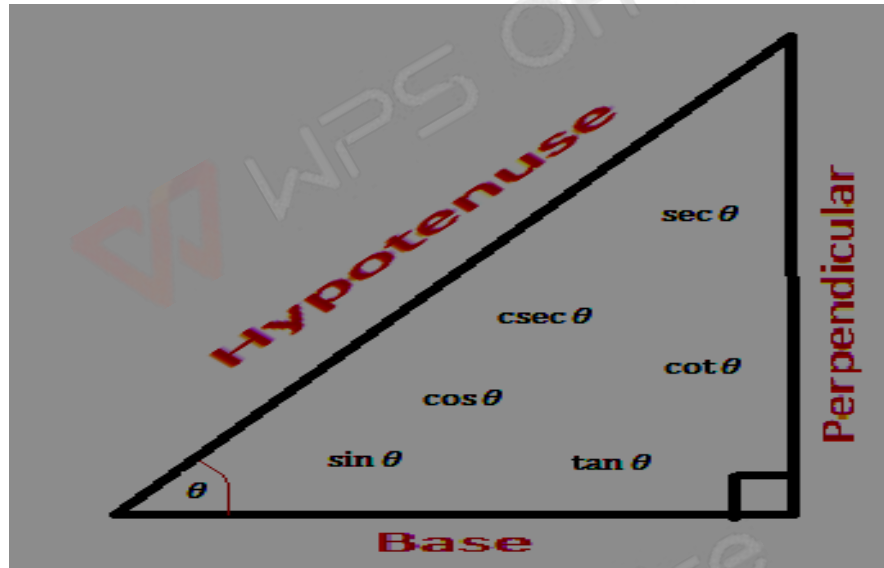- ➢ What is the sum of all angles of right angled triangle?

Introduction of Trigonometry

The word 'Trigonometry' is derived from the Greek words 'tri' (meaning three), 'gon' (meaning sides) and 'metron' (meaning measure). In fact, trigonometry is the study of the relationship between the sides and angles of right angled triangle.

This lesson will introduce students to the concept of trigonometry. They will learn about the trigonometric ratios of an acute angle in a right angled triangle. They will also learn about the trigonometric ratios of specific angles such as 0^0, 45^0, 60^0, 30^0 and 90^0 and trigonometric ratios of complementary angles.

They will also study different trigonometric identities.

TRIGONOMETRIC RATIOS: The certain ratios involving the sides of a right triangle are called trigonometric ratios.

$$\text{Sin } \theta = \frac{P}{H} \qquad\qquad \text{Cosec } \theta = \frac{H}{P}$$

$$\text{Cos } \theta = \frac{B}{H} \qquad\qquad \text{Sec } \theta = \frac{H}{P}$$

$$\text{Tan } \theta = \frac{P}{B} \qquad\qquad \text{Cot } \theta = \frac{B}{P}$$

VALUE OF TRIGONOMETRIC RATIOS OF STANDARD ANGLES:-

	0^0	30^0	45^0	60^0	90^0
Sin θ	0	$\dfrac{1}{2}$	$\dfrac{1}{\sqrt{2}}$	$\dfrac{\sqrt{3}}{2}$	1
Cos θ	1	$\dfrac{\sqrt{3}}{2}$	$\dfrac{1}{\sqrt{2}}$	$\dfrac{1}{2}$	0
Tan θ	0	$\dfrac{1}{\sqrt{3}}$ $\sqrt{2}$	1	$\sqrt{3}$	Not defined
Cot θ	Not defined	$\sqrt{3}$	1	$\dfrac{1}{\sqrt{3}}$	0
Sec θ	1	$\dfrac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not defined

cosec θ	Not defined	2	$\sqrt{2}$	$\dfrac{2}{\sqrt{3}}$	1

TRIGONOMETRIC RATIOS OF COMPLEMENTARY ANGLES:-

$\text{Sin}(90^0 - A) = \text{Cos } A$ $\qquad$ $\text{Cos}(90^0 - A) = \text{Sin } A$

$\text{Tan}(90^0 - A) = \text{Cot } A$ $\qquad$ $\text{Cot}(90^0 - A) = \text{Tan } A$

$\text{Sec}(90^0 - A) = \text{Cosec } A$ $\qquad$ $\text{Cosec}(90^0 - A) = \text{Sec } A$

TRIGONOMETRIC IDENTITIES:-

1) $\text{Sin}^2 A + \text{Cos}^2 A = 1$
2) $1 + \text{Tan}^2 A = \text{Sec}^2 A$
3) $1 + \text{Cot}^2 A = \text{Cosec}^2 A$

Pedagogical Strategies

Activity 1

Warm up session : Begin the lesson by recalling the Pythagoras theorem introduce the concept of angle of elevation and angle of depression. Explain how a right angle triangle can be imagined to be formed and used to calculate heights and distances. Explain the concept of trigonometry and talk briefly about its history. Ancient Egyptians used the ideas of Trigonometric function and similar triangles to make the buildings and pyramids in ancient Greece were also made by this concept. Trigonometric functions were used to predict the position of stars, time of the day and period of the year. Trigonometry helps in various fields such as optics and statistics.

Activity – 2

Flash card Activity: a)In this activity students will calculate the trigonometric ratios of an acute angle of a given right angle triangle.

b)Divide the class into two teams and show them a card with a question. The team member will discuss amongst themselves and then one child will answer. The team with maximum correct answer will be the winner.

c.In Maths lab model of Pythagoras will be shown.

Activity - 3

Chart on Trigonometric Ratios and identities

In this activity students will prepare charts on trigonometric ratios and identities. Divide the class into two groups and ask them to prepare chart on the following topics: Group A : Depict trigonometric ratios of an acute angle of a right angle triangle(for e.g $0^0, 30°, 45°, 60°, 90^0$)Group B: Make a table depicting the trigonometric values of complementary angles. Make another table of trigonometric identities.
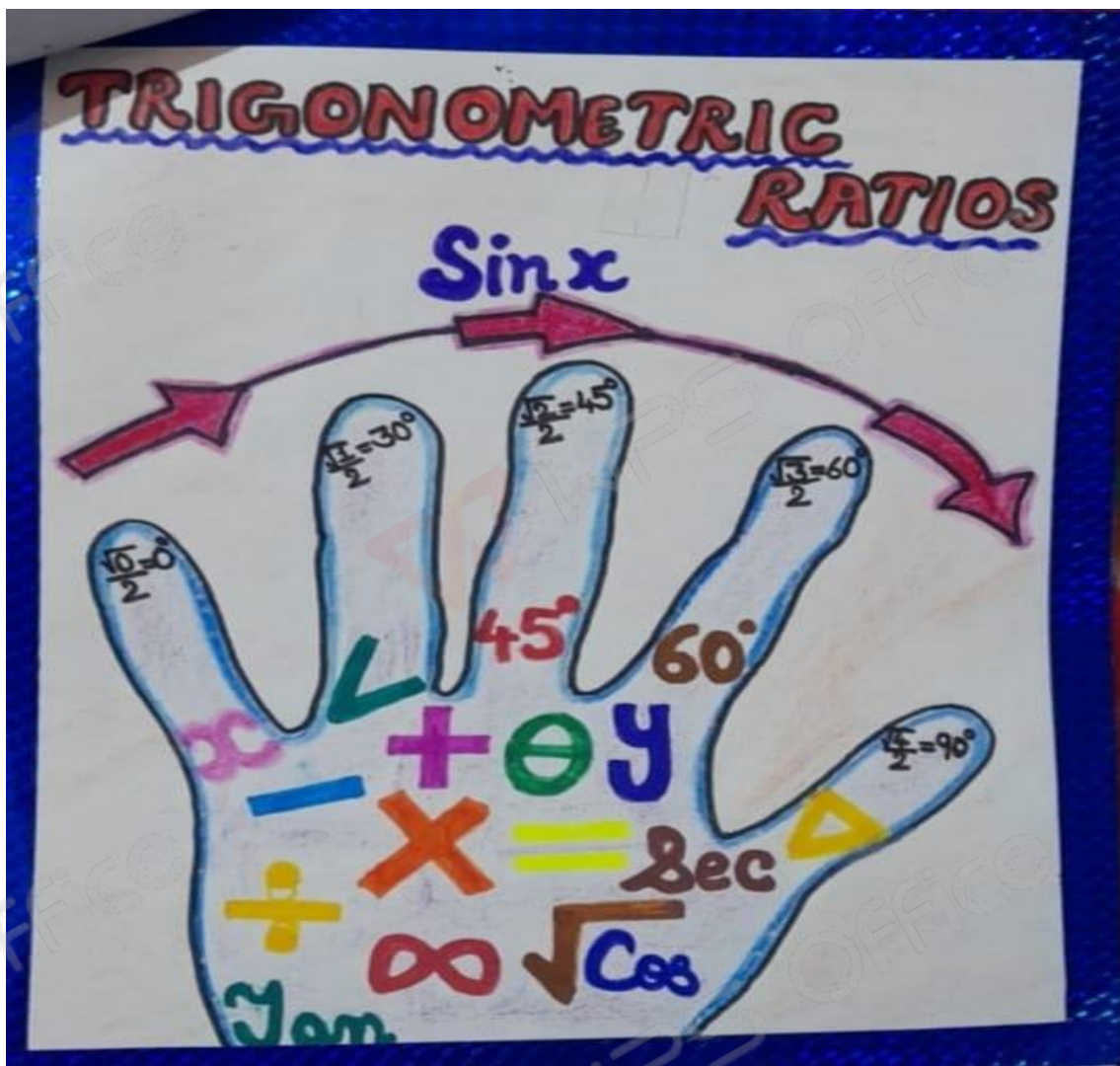
Art Integration Activity-

DECODING BASED ON TRIGONOMETRY....

| M | A | T | H | S | | I | S | | I | M | P | O | R | − |

| T | A | N | T | | F | O | R | | L | I | F | E |

1. $\text{Cosec } 45° = \dfrac{\sqrt{2}}{} = E$

2. $\sin 60° = \dfrac{\sqrt{3}}{2} = H$

3. $\tan 90° = \text{infinity} = N$

4. $\cos 180° = -1 = I$

5. $\tan 45° = 1 = M$

6. $\sin 0° = 0 = A$

7. $\cos 60° = \dfrac{1}{2} = T$

8. $\cos 45° = \dfrac{1}{\sqrt{2}} = S$

9. $\tan 60° = \sqrt{3} = O$

10. $\tan 30° = \dfrac{1}{\sqrt{3}} = R$

11. $\sec 60° = 2 = F$

12. $\text{Cosec } 60° = \dfrac{2}{\sqrt{3}} = L$

13. $\sec 30° = \dfrac{2}{\sqrt{3}} = P$

| 1 | 0 | $\frac{2}{\sqrt{3}}$ | $\frac{3}{2\sqrt{3}}$ | $\frac{\sqrt{2}}{2}$ | | | | | | | 1.73 | | − |

| 0.5 | 0 | ∞ | $\frac{6}{\sqrt{3}}$ | | | | | | | | | $\sqrt{2}$ |

GROUP ACTIVITY –

        Teacher will tell the students to prepare the Power Point Presentation on Trigonometry in group of 5 students.

REFLECTION UPON THE ACTIVITY:

> ➢ After the completion of the above activity, students will be asked what they have learnt.
> ➢ Students will narrate their learning experience.
>   .

IMMEDIATE FEEDBACK:

        Peer discussion will be conducted in the form of pair-think-share.

IT: - Prepare PPT on trigonometry using transitions and Animation.

MATHEMATICS: - Use the knowledge of trigonometry in daily life. .
APPLICATION OF TRIGONOMETRY IN REAL LIFE:-

Trigonometry can be defined as calculations with triangles involved in the study of lengths, heights and angles. Trigonometry and its functions have an enormous number of uses in our daily life. For instance, it is used in geography to measure the distance between landmarks, in astronomy to measure the distance of nearby stars and also in the satellite navigation system.

Before going into the detailed explanation of trigonometry applications, let's start with the introduction of trigonometry and its functions.

It may not have direct applications in solving practical issues but is used in various field. For example, trigonometry is used in developing computer music: as you are familiar that sound travels in the form of waves and this wave pattern, through a sine or cosine function for developing computer music. Here are a few applications where trigonometry and its functions are applicable.

SKILL DEVELOPED: Observation skills, Analysis, Critical thinking, Team work, and Interpersonal skills.

Home work/Assignments

1. Work Exercise from the NCERT
2. Extra practice Assignment from The Exemplar.

TEACHING AIDS: Green board, chalk, duster, charts, smart board, etc.

ASSESSMENT TECHNIQUE S: Class test, oral discussion, oral test, worksheets and assignments of extra questions.

REFERENCE:
  ➢ NCERT BOOK

   E x a m p l e r   b o o k

  ➢ Teachers resource from CBSE

KEY WORDS: - Trigonometry, T-ratios, Acute angle, Hypotenuse, Identities

EXTENDED LEARNING:-

Students can extend their learning through the Link and can find more valuable and interesting concepts on mathematics at cbsemathematics.com

Remedial teaching
For week students buddy help to be provided for gifted students hot questions , MCQ,case study questions from NCERT and Exampler will be shared.

LESSON PLAN

CLASS X (MATHEMATICS)   Topic…. **(Application of Trigonometry**)

Number of teaching days_=6days

LEARNING OBJECTIVES: Students will be able

- To develop a positive attitude and a liking for mathematics.
- To make necessary connections between mathematics and everyday thinking.
- To develop willingness to work in collaboration.
- To appreciate the role, value and use of mathematics in society.

SPECIFIC OBJECTIVES: Students will be able

- To define the term 'Trigonometry'.
- To define the trigonometric ratios.
- To define the relationship between trigonometric ratios.
- To define the range of trigonometric ratios.
- To define the complementary angles.
- To learn trigonometric Identities.
- To explain the term line of sight, angle of elevation and angle of depression.
- To calculate heights and distances using trigonometric ratio.

EXPECTED OUTCOMES:

- Students will be able to work out the trigonometric ratios of specific angles such as 0^0, 30^0,45^0, $60^0$and 90^0.
- Students will be able to know about various concepts related to trigonometry, such as line of sight, angle of elevation and angle of depression.
- Students will be able to solve word problems pertaining to heights and distances using the trigonometric ratio-

   Pk Testing…   Teacher will start the lesson with P.K. Testing. To test the previous knowledge teacher will ask the following question

- What is the value of sin 45^0?
- What is the value of cos 60^0?
- What is the value of tan 30^0?

Introduction

Line of sight:- The line of sight is the line drawn from the eye of an observer to the point in the object viewed by the observer.
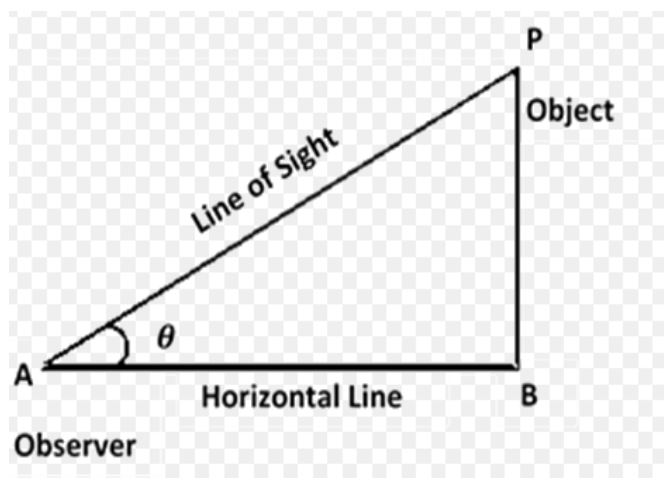
Angle of elevation:- The angle of elevation of an object viewed , is the angle formed by the line of sight with the horizontal when it is above the horizontal level, i.e., the case when we raise our head to look at the object.
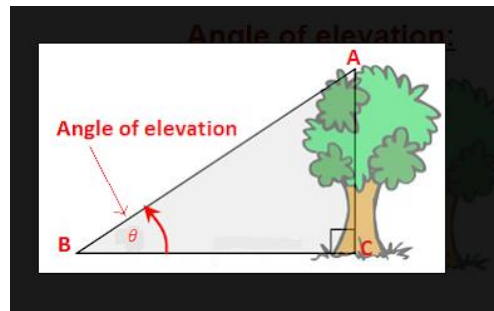
Angle of depression: - The angle of depression of an object viewed, is the angle formed by the line of sight with the horizontal when it is below the horizontal level, i.e., the case when we lower our head to look at the object.

Pedagogical Strategies Activity 1

Begin the lesson by recalling the concepts of trigonometric ratios. You may create flash cards with some angles mentioned on one side and the value or trigonometric ratio of the angles on the other side of the cards. For example, you can write Sin 90^0 on one side of a flash card and its value '1' on the other side. Conduct a quiz in the class using these flashcards. Thereafter, talk about the angle of elevation, angle of depression and line of sight. Ask the students to cite a few practical examples of angle of elevation and depression. Two examples are provided here:

A girl is looking down at a rock from the top of a 20- m high light house. Her eyes are making an angle of depression with the rock, which is lying near the base of the light house.

A man is looking at a bird sitting on the top a tree. The line of sight of the man will form an angle of elevation.

Activity – 2 (Make an inclinometer)

Materials Required:-

- ❖ Drinking straw
- ❖ Protractor
- ❖ Adhesive
- ❖ Small mass (such as coin or washer)
- ❖ Strong thread

Procedure:-

Attach the straw to the protractor (using the adhesive) as shown in the diagram. Then, attach the thread (with the mass tied at its end) to the middle of the protractor. The thread should hang vertically as shown in the diagram.
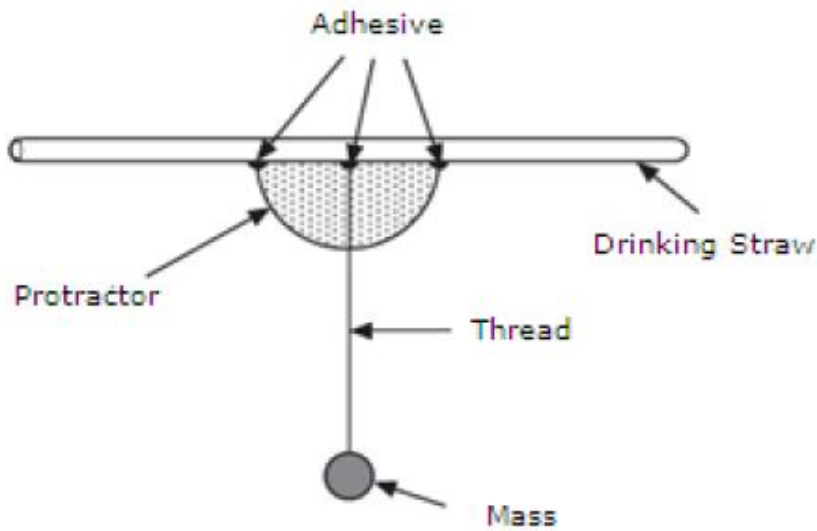
After finishing the activity, students will fill the words in the "L" column of KWL chart that they have learnt from that activity.

Art Integration Activity-
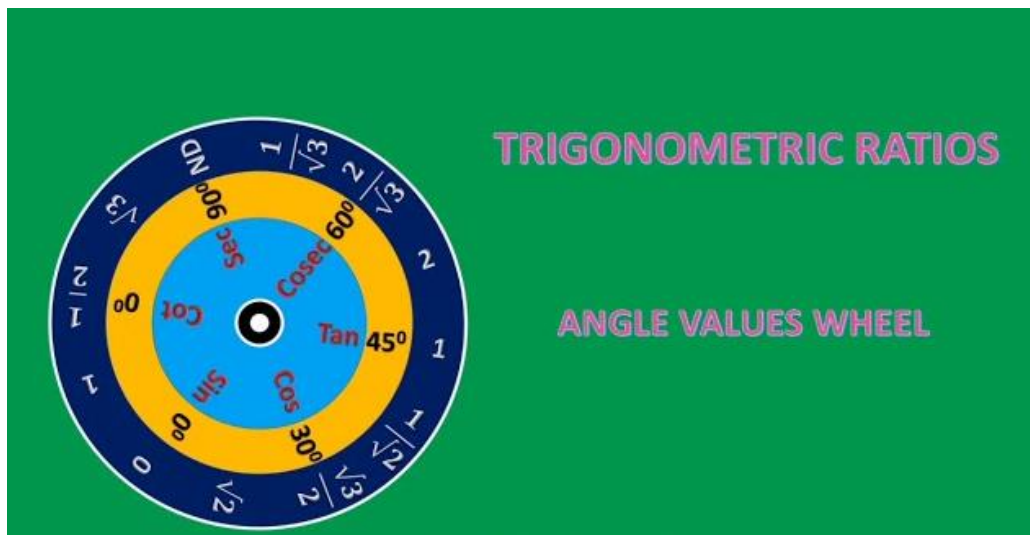
GROUP ACTIVITY –ICT

Teacher will tell the students to prepare the Power Point Presentation on Application of Trigonometry in group of 5 students.

REFLECTION UPON THE ACTIVITY:

- ➢ After the completion of the above activity, students will be asked what they have learnt.
- ➢ Students will narrate their learning experience.
  .

IMMEDIATE FEEDBACK:

Peer discussion will be conducted in the form of pair-think-share.

SUBJECT INTEGRATION

ART & CRAFT: Students will make activity using craft paper, graph paper and coloured sheets.

IT: - Prepare PPT on trigonometry using transitions and Animation.

MATHEMATICS: - Use the knowledge of trigonometry in daily life.

Physics:- In physics, trigonometry is used to find the components of vectors, model the mechanics of waves (both physical and electromagnetic) and oscillations, sum the strength of fields and use dot and cross products. Even in projectile motion, you have a lot of application of trigonometry.

APPLICATION OF TRIGONOMETRY IN REAL LIFE:-

Trigonometry can be defined as calculations with triangles involved in the study of lengths, heights and angles. Trigonometry and its functions have an enormous number of uses in our daily life. For instance, it is used in geography to measure the distance between landmarks, in astronomy to measure the distance of nearby stars and also in the satellite navigation system.

It may not have direct applications in solving practical issues but is used in various field. For example, trigonometry is used in developing computer music: as you are familiar that sound travels in the form of waves and this wave pattern, through a sine or cosine function for developing computer music. Here are a few applications where trigonometry and its functions are applicable.

Trigonometry is used to set directions such as the north-south or east-west. It tells you what direction to take with the compass to get in a straight direction. It is used in navigation in order to pinpoint a location. It is also used to find the distance of the shore from a point in the sea. It is also used to see the horizon.
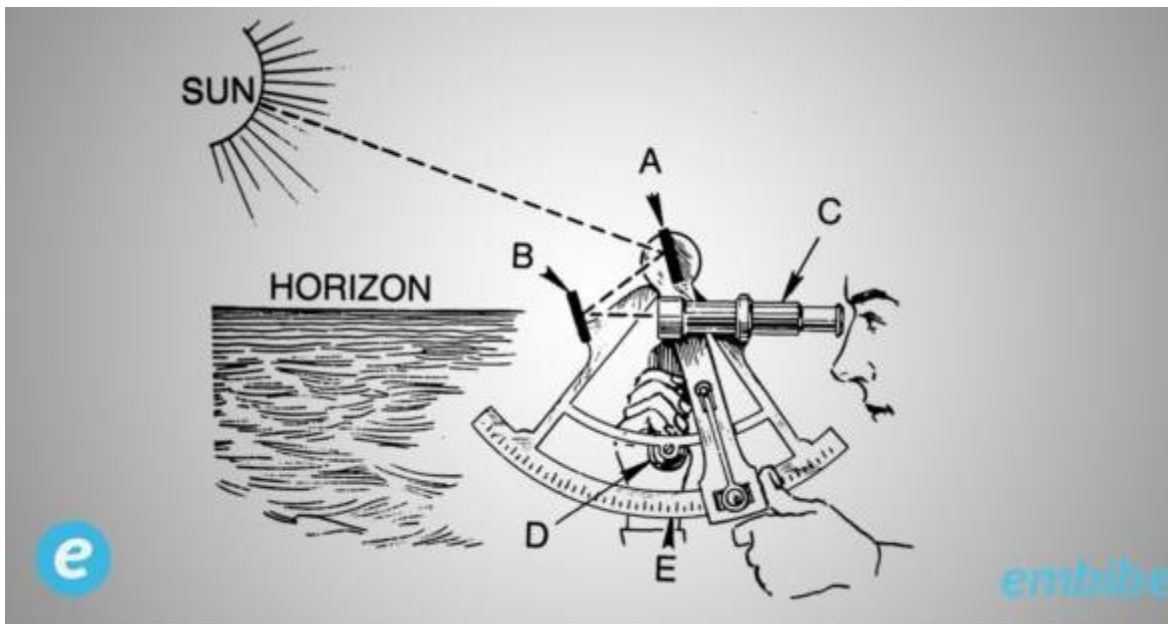
SKILL DEVELOPED: Observation skills, Analysis, Critical thinking, Team work, and Interpersonal skills.

Home work/Assignments

1. Work Exercise from the NCERT
2. Extra practice Assignment from The Exemplar.

TEACHING AIDS: Green board, chalk, duster, charts, smart board, etc.

ASSESSMENT TECHNIQUE S: Class test, oral discussion, oral test, worksheets and assignments of extra questions.

REFERENCE:

➢ NCERT BOOK
➢ ICT(video related to the topic)
  Exampler book

KEY WORDS: - Trigonometry, T-ratios, Acute angle, Hypotenuse, Identities

Remedial teaching

For weeks students

buddy help to be provided

FOR gifted students …Hot questions from NCRT examples will be given encouragement for referring other resources.

CLASS X
CH-10
TOPIC-: CIRCLES

DURATION:-
This topic is divided into Eight modules and are completed in ten class meetings.

PRE- REQUISITE KNOWLEDGE:-
Knowledge Properties of circle class gth
Knowledge of Pythagoras theorem.

TEACHING AIDS:- Green Board, Chalk, Duster, Charts etc.

LEARNING OUTCOMES-:
After studying this lesson students should know
• the circle and the different terms associated with the circle.
• Tangent and secant to the circle.
• Tangent is always perpendicular to the radius of the circle.
• Length of tangents from external point to the circle is always equal.
• Students should be able to apply all the results and concepts of circle in the dailylife problems.

PEDAGOGICAL STRATEGIES-:
PPT and Digital Content would be shared.

PROCEDURE:-
Start the session by checking their previous knowledge, by asking the questions related to the circle and the terms associated with it. Also explain the difference between the circle and sphere. After this introduce the topic circle step by step as follows.-:

1) Define circle and the terms related to the circle like centre, radius, diameter, chord, segment and sector of the circle. Explain the topic diagrammatically and give some examples. Explain all the results associated with the circle that students had read in their 9th class.
2) Now define the term tangent and secant to the circle and explain the topic through their figures.
3) Now completely explain the theorem that radius is always perpendicular to the tangent at the point of contact. Also give its complete proof to the students.
4) Help the students by Solving the problems based on the above theorem.
5) Now completely explain the theorem that length of tangent from external point to the circle are equal in length. Also give its complete proof to the students.
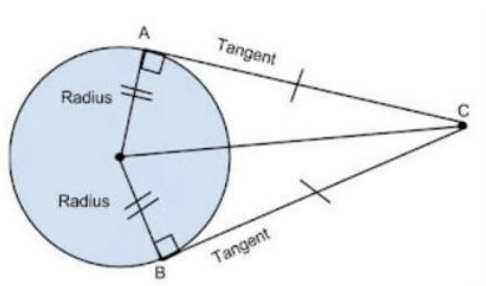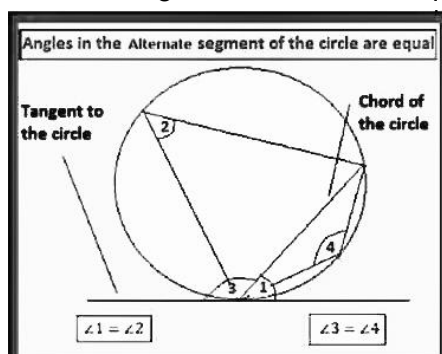
6) Help the students in solving the problems based on the above theorem.

ART INTEGRATION:-

Students will be making the following chart to understand the theorem that angles in the alternate segment of circle are equal.

FEEDBACK AND REMEDIAL TEACHING:-

• Review questions given by the teacher.

• Students can prepare a presentation on circle which include all the important terms and results associated with the circle.

• Solve NCERT problems with examples.

• Solve assignment given by the teacher.

RESOURCES AND ICT:-

Students can extend their learning through the RESOURCE CENTRE and can find more valuable and interesting concepts on mathematics at cbsemathematics.com.

INCLUSIVE PRACTICES AND FULL PARTICIPATION:-

Assignment sheet will be given as home work at the end of the topic. Separate sheets which will include questions of logical thinking and Higher order thinking skills will be given to the above average students.

ART INTEGRATION ACTIVITY-:

CLASS X
Ch 11
TOPIC: Area Related to Circles
DURATION: The topic will be divided into eight modules.

SPECIFIC OBJECTIVES: Studentswillbeable
Recall the concept of circumference of circle and make use of it in daily life situation.
Identify and apply the term major sector, minor sector, major segment, minor segment.
Find perimeter and area of a sector of a circle.
Find perimeter and area of a segment of a circle.
Find the areas of combinations of plane figures.

EXPECTED OUTCOMES:
After studying this lesson, learners will be able to describe various geometrical terms related to a circle, such as chord, radius, diameter, arc, segment, sector and circumference. They will also be able to calculate the length of an arc of a circle and the areas of a sector and a segment of a circle. Additionally, they will be able to calculate the areas of combinations of plane figures.

P.K Testing
To test the previous knowledge teacher will ask the following question
What is the area of a square?
What is the area of a rectangle?
What is the circumference of circle?
What is the area of the circle?
What is the shape of the wheels of car?
What is the meaning of radius and centre?

TEACHING AIDS: Greenboard,chalk,duster,charts,smartboard,etc.

LEARNING OUTCOMES:
Students will be able-
To develop a positive attitude and a liking for mathematics.
To make necessary connections between mathematics and everyday thinking.
To develop willingness to work in collaboration.
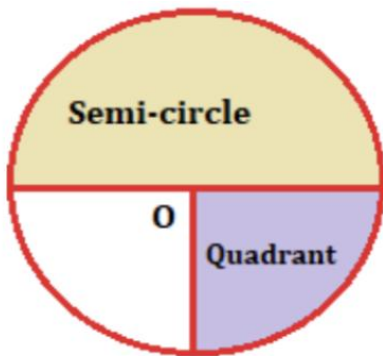To appreciate the role, value and use of mathematics in society.

PEDAGOGICAL STRATEGIES:
CIRCLE:- A circle is the locus of a point,which fixed point in the plane is always constant.
This fixed point is called Centre of the circle and fixed distance is call radius of circle.
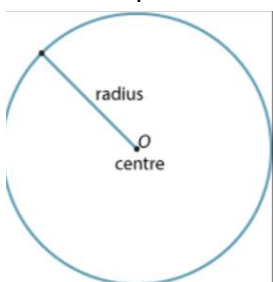
ART INTEGRATION ACTIVITY-:

Circumference of circle = 2πr
Area of Circle = πr^2

Circumference of semi-circle Perimeter of semi-circle
Area of semi- Circle Circumference of quadrant Perimeter of quadrant Area of quadrant of circle
= πr
= πr+2r
= 12πr^2
= 12πr
= 12πr+2r = 14πr^2
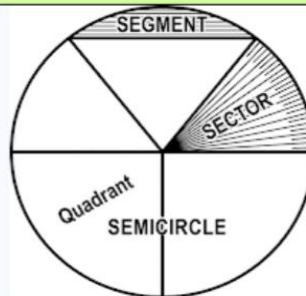
SECTOR OF CIRCLE

The area between the radius and the arc is called sector.

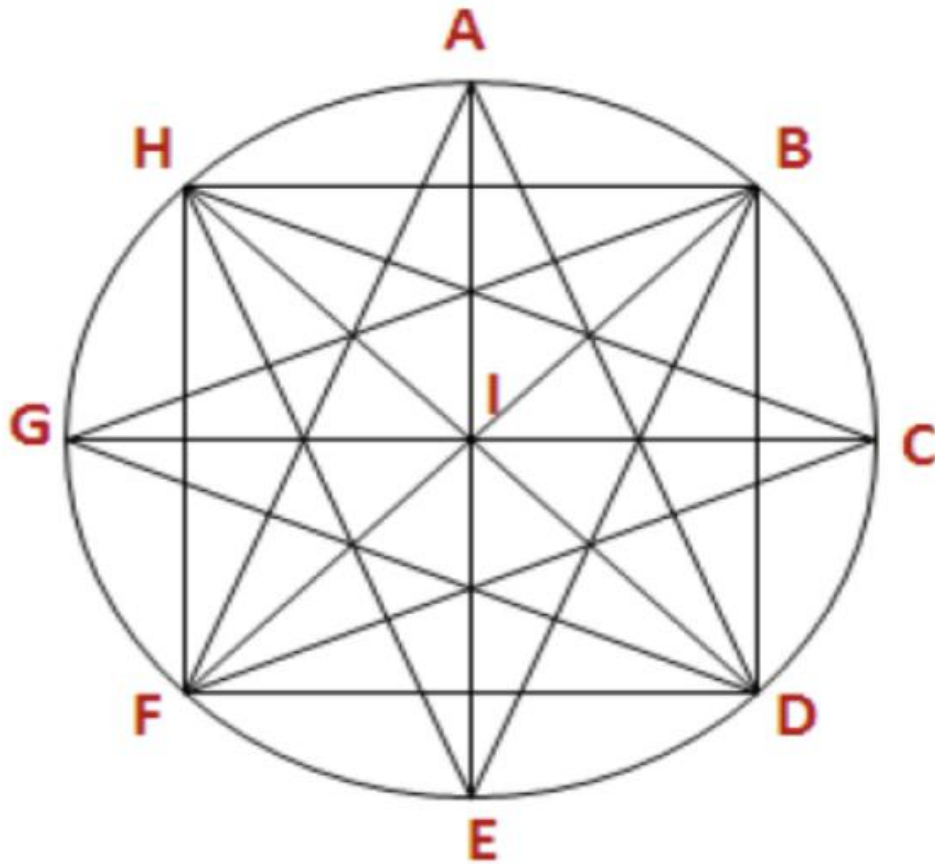$$Area\ of\ the\ sector\ of\ the\ circle = \frac{\theta}{360}\pi r^2$$

SEGMENT OF CIRCLE

The area between the chord and arc is called segment.

$$Area\ of\ the\ segment\ of\ the\ circle = \frac{\theta}{360}\pi r^2 - \frac{1}{2}r^2 sin\theta$$

Activity 1
Begin the lesson by drawing the following illustration on the board
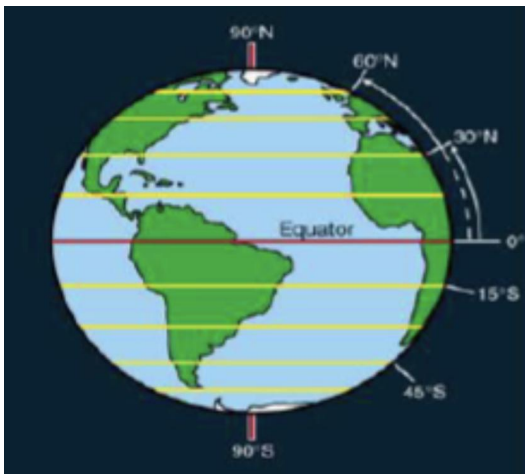
ART INTEGRATION ACTIVITY-:

Thereafter, ask the learners to identify the radius, diameter, sector, and segment present in the illustration.

Activity 3(Area of a Segment)
In this activity, learners will calculate the area of a segment of a circle.
Show the image provided or draw a similar image on the board. Then, ask the learners to identify the chords in the image. Now, shade a segment of the circle and then ask the learners to list the measurements required to calculate the area of this segment. After the learners have answered, write the equation to calculate the area of a segment of a circle on the board. Thereafter, provide the required measurements for each segment of the circle and ask the learners to calculate the area.

ART INTEGRATION ACTIVITY-:
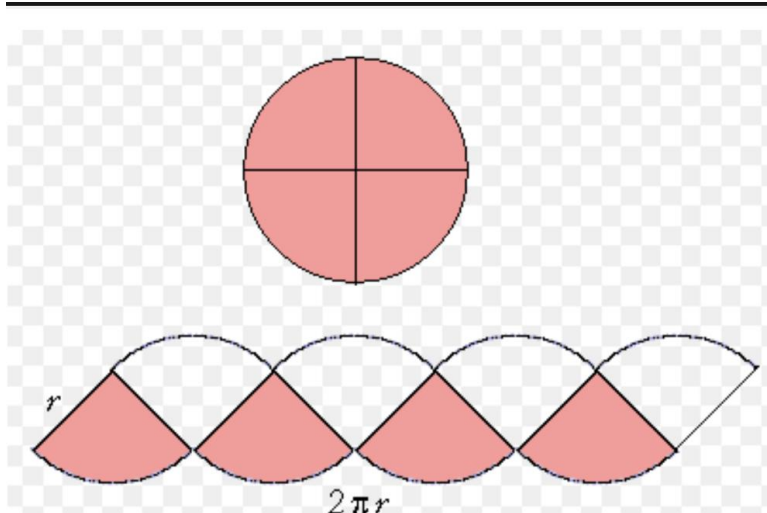
FEEDBACK AND REMEDIAL TEACHING:-
 After the of the above activity, students will be asked what they have learnt.
 Students will narrate their learning experience.
Peer discussion will be conducted in the form of pair-think-share.

RESOURCES INCLUDING ICT:-:
 NCERT BOOK
 ICT(video related to the topic)
 Teachers resource from CBSE.

INCLUSIVE PRACTICES AND FULL PARTICIPATION: - Use the knowledge of Areas Related to circle in daily life. APPLICATION OF AREAS RELATED TO CIRCLE IN REAL LIFE:-

Architects use the symmetrical properties of a circle to design Ferris-wheels, buildings, athletic tracks, roundabouts, etc. These circular measurements are also significant for engineers in designing airplanes, bicycles, rockets, etc. The circle is indispensable.
Look at the shapes (shapes of objects) all around us. An object with a circular face such as a dinning plate, a pop can, a traffic cone or a circular flower bed in a garden are all built or prepared keeping the concept of area of a circle in mind.

Home work/Assignments
1. Work Exercise from the NCERT
2. Extra practice Assignment from The Exemplar.

ASSESSMENT TECHNIQUES: Class test, oral discussion, oral test, worksheets and assignments of extra questions.

CLASS X
CHAPTER 12:
SURFACE AREA & VOLUME
DURATION:
This topic is divided into Fifteen modules.

PRE- REQUISITE KNOWLEDGE:-
• Perimeter and Area: Class VII
• Visualising Solid Shapes: Class VII
• Visualising Solid Shapes: Class VIII
• Mensuration: Class VIII
• Surface Areas and Volumes: Class IX
• Knowledge of unit conversion in mathematics

TEACHING AIDS
Smart board, green board , chalk .

LEARNING OUTCOMES:
After studying this lesson students should know
• Different shapes of solid figures.
• All formulas and all important
concepts related to the surface area of solid figures.
• All formulas and all important concepts related to the volume of solid figures.
• Solving the problems related to the solid figures.
• Students should also know the method of implementation of these formulas in simple and complex problems.

PEDAGOGICAL STRATEGIES:-
1) Hands-on Activities: Engage students in hands-on activities that involve measuring, cutting, and folding shapes to help them visualize and understand the concepts of surface area and volume. For example, provide them with cubes, cuboids, and other objects to explore and measure.

2) Real-life Examples: Relate surface area and volume to real-life examples to make the concepts more relatable and relevant to students. For instance, you can discuss the surface area and volume of everyday objects like cereal boxes, water tanks, or building blocks.

ART INTEGRATION:-
Students will be asked to prepare these shapes in 3d and to find surface area and volume.
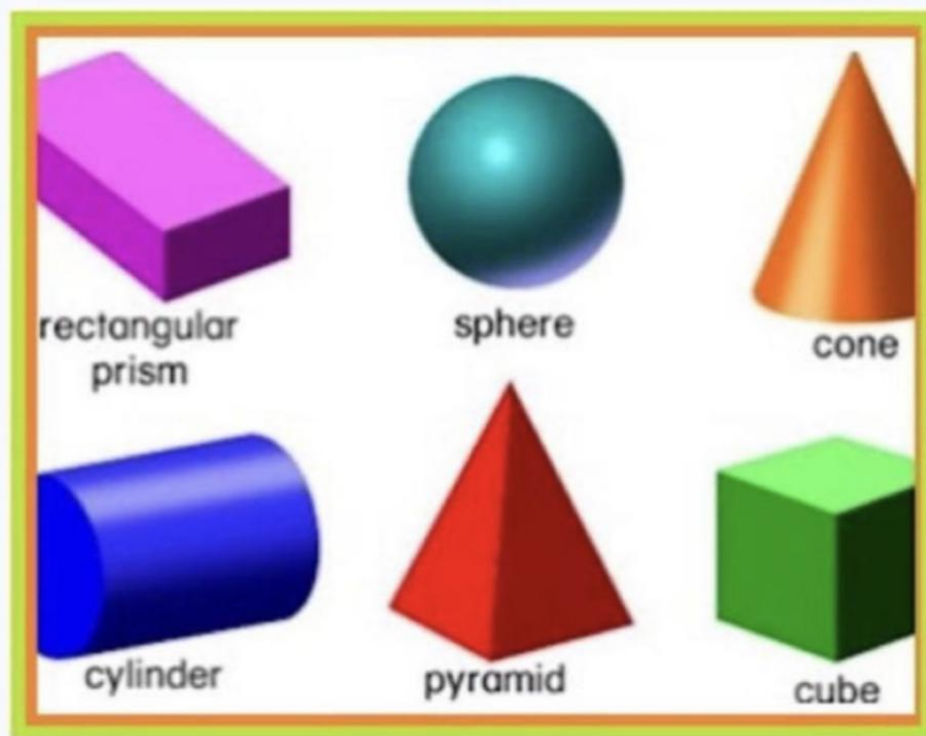
FEEDBACK AND REMEDIAL TEACHING

• Review questions given by the teacher.
• Students should prepare the presentation on the formulas of surface area and volumes of different solid figures.
• Solve NCERT problems with
examples.
• Solve assignment given by the teacher.

RESOURCES INCLUDING ICT
Students can extend their learning
through the RESOURCE CENTRE and
can find more valuable and interesting concepts on mathematics
at cbsemathematics.com

INCLUSIVE PRACTICES AND FULL PARTICIPATION:
Due to various social backgrounds and multiple intelligences, the classroom is a diverse
arena. The following techniques can be used:
1)For gifted students:
  ● Encouraging them for referring other books and practicing HOTS.
2)For weak students:
  ● Peer group help
  ● Extra classes
  ● Special Assignments will be provided.

LESSON PLAN
CLASS X (MATHEMATICS)
Chapter 13 (Statistics)

LEARNING OBJECTIVES: Students will be able
➢ To develop a positive attitude and a liking for mathematics.
➢ To make necessary connections between mathematics and everyday thinking.
➢ To develop willingness to work in collaboration.
➢ To appreciate the role, value and use of mathematics in society.
SPECIFIC OBJECTIVES: Students will be able
➢ Find mean for grouped data by direct method, assumed mean method & step deviation method.
➢ Learn to find the mode for grouped data.
➢ Learn to calculate cumulative frequency of a class.
➢ Find median for grouped data using formula.
➢ Apply the knowledge ogive to find median of grouped data graphically.

EXPECTED OUTCOMES: After studying this lesson students should know
➢ All formulas of finding mean of the given data.
➢ All formulas of finding mode of the given data.
➢ All formulas of finding median of the given data.
➢ The relation between mean, mode and median (Empirical formula).
➢ Method of finding the less than ogive and more than ogive and the median from the graph.

INTRODUCTION:-
Teacher will start the lesson with P.K. Testing. To test the previous knowledge teacher will ask the following question

PK Testing:-

➢ What is the meaning of range?
➢ What is the meaning of class marks?
➢ What is the meaning of data?

This chapter will introduce the students to the various methods used to calculate the mean and mode of grouped data. They will also learn to find the median of grouped and ungrouped data. Moreover, they will learn to graphically represent cumulative frequency curve.
Begin the chapter by holding a quiz about the concept that students have learnt in the previous classes. For example, mean, mode and median. You may divide the class into two groups and give them questions based on the calculation of mean, mode and median from ungrouped data. You may also ask them to interpret data from different types of graphs and frequency distribution tables. Thereafter, show a grouped frequency distribution table to the students and teach them to calculate mean using different methods.

Mean

DIRECT FORMULA:

$$\text{MEAN} (\bar{x}) = \Sigma f_i x_i / \Sigma f_i$$

THE ASSUMED MEAN METHOD:

$\text{MEAN} = a + \Sigma f_i d_i / \Sigma f_i$

STEP DEVIATION METHOD:

$\text{MEAN} = a + \Sigma f_i u_i / \Sigma f_i \times h$

$\text{MODE} = l + \dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \times h$

Where   l = lower limit of the modal class,

h = size of the class internal,

= frequency of the modal class,

= frequency of the class preceding the modal class

= frequency of the class succeeding the modal class

Median

$\text{Median} = l + \dfrac{\dfrac{N}{2} - C}{f} \times h$

Where   l = lower limit of median class,

N = number of observations

C = cumulative frequency of class receding the median class,

= frequency of median class,
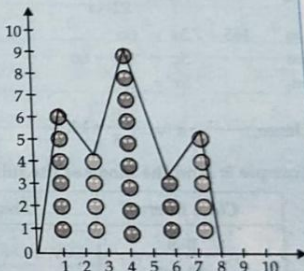
= class size

Pedagogical Strategies

After finishing the activity, students will fill the words in the "L" column of KWL chart that they have learnt from that activity.

GROUP ACTIVITY-:
Teacher will tell the students to prepare the Power Point Presentation on Statistics in group of 5 students

REFLECTION UPON THE ACTIVITY:

➢ After the completion of the above activity, students will be asked what they have learnt.
➢ Students will narrate their learning experience.

IMMEDIATE FEEDBACK:
Peer discussion will be conducted in the form of pair-think-share.

IT: - Prepare PPT on surface areas and volumes using transitions and Animation.

MATHEMATICS: - Use the knowledge of statistics in daily life.

APPLICATION OF STATISTICS IN REAL LIFE:-
Application of Statistics in Statistical Modeling
Statistical modelling involves developing predictive models based on design, pattern perception and data development. Modelling is widely used in prediction of election results, survival analysis of populations and scientific surveys. These tools are used by Meteorologists to predict the weather and to the study different environmental and geographical disturbances in the earth
Application of Statistics in Government Sectors
As a regulatory body government decisions are mostly outcomes of well-researched statistics and figures on which decisions are made related to health, populations, education, and development. It may administer research on education to monitor the improvement of college students.
Application of Statistics in Clinical Trial and Design
The medical field also relies heavily on statistical data in order to run their operations. When a new drug or treatment is discovered, it has to first be tested on a group of people to know its efficacy and safety. The process includes an analysis called trial where medications or interventions are tested to know how human bodies react to a particular treatment. Medical professionals also perform studies by race, age, or nationality to see the effect of these characteristics on health.
Application of Statistics in Corporate Sectors
Almost every small and large business employs a dedicated statistical research division that aims to predict and analyze the companies current and predicted growth. Research issues related to products, customer service, employees and sales. Business success relies on identifying what is important and what is vague
Application of Statistics in Weather Forecasting
Have you ever looked at a weather forecast? Do you know how the government, as well as several international and national news channels, forecast the weather? Weather forecasting

relies heavily on statistics. Weather forecasting on computers is based on a set of statistical functions. All of these statistics are used to compare the current weather to previously recorded seasons and conditions.

Application of Statistics in Political Campaigns

In a political campaign, the application of statistics is critical and crucial. No one can run a perfect political campaign without statistics. It aids politicians, or rather, the countries predicted future leaders, in determining how many chances they have to win an election in a specific location. Statistics also assist the news station in predicting the election winner. It also aids political parties in determining how many candidates they have in a certain voting zone. It, on the other hand, aids the country in predicting future government.

Application of Statistics in Sports

There are numerous applications of statistics in sports as well. Any sport, such as football, cricket, basketball, tennis, badminton, chess, volleyball, and so on, uses statistics in some way. Every sport necessitates statistics in order to improve its effectiveness. Statistics assist a sportsperson in gaining an understanding of his or her performance in a particular sport. In today's sports, statistics data are being used to take things to the next level. The reason for this is that sports are becoming more popular, and there are numerous sorts of equipment used in sports to collect data on numerous factors.

Application of Statistics in Predicting Diseases

Even in the medical area, statistics plays a role. Statistics allow us to determine how many people are affected by the condition. It also allows us to see how many people have died as a result of the same ailment. However, the nicest part about statistics is that it also allows you to determine how much you were impacted by the deceased. According to one study, more than 75 per cent of the world's population has been infected with COVID-19, which is a virus. In that scenario, you should try to avoid coming into contact with this virus or sickness.

Application of Statistics in Financial Markets

The financial market is completely reliant on statistical analysis. Statistics are used to compute all of the stock prices. It also assists the investor in deciding whether or not to invest in a certain stock. It also aids corporations in managing their finances in order to conduct long-term operations.

SKILL DEVELOPED: Observation skills, Analysis, Critical thinking, Team work, and Interpersonal skills.

Home work/Assignments

1. Work Exercise from the NCERT
2. Extra practice Assignment from The Exemplar.

TEACHING AIDS: Green board, chalk, duster, charts, smart board, etc.

ASSESSMENT TECHNIQUE S: Class test, oral discussion, oral test, worksheets and assignments of extra questions.

REFERENCE:

➢ NCERT BOOK
➢ ICT(video related to the topic)
➢ Teachers resource from CBSE

KEY WORDS: Collection, Objects, Mean, mode, Median, ogive, frequency.

Remedial teaching: For weak students buddy help will be provided and objectives,MCQ questions will be shared for others hot questions case study questions from the exampler book and other resources will be shared.

Class X
Chapter 14
TOPIC:- Probability

DURATION:-
This topic is divided into 8 modules.

PRE- REQUISITE KNOWLEDGE:-
Basic knowledge of probability chapter 15class IX

TEACHING AIDS:- Green Board,
Chalk, Duster, Charts, Laptop, Internet connection etc.

METHODOLOGY:- Demonstration and Lecture method

LEARNING OUTCOMES
After studying this lesson students should knowthe
• Probability
of sure event impossible event equally likely events.
• Range of Probability.
• Method of writing sample space
when different number of coins are
tossed.
• Method of
writing sample space when different number of dice are
thrown.
• Students should know the terms
associated with the playing cards and become able to tackle the
problems with them.
• Able to find probability in different
situations.

PEDAGOGICAL STRATEGIES::
• Classical definition of probability.
 • Probability of sure event, impossible event and concept of equally likely events.
• Range of probability.
• Concept of probability with one
coin, two coin three coins and method of writing their sample
space.
• Concept of probability with the playing cards.
• Concept of probability with the
term at least (2), at most (5) , "and "(common), "or"(all with common one time) etc.
• Simple problems on finding the probabilities of an event.
PROCEDURE:-
Start the session by checking their
previous knowledge, by asking the questions of simple probability of an event. After this
introduce the topic probability step by step a s follows.

1 Introduction and classical definition
of probability. Also explain the concept that P(E) +P(not E) =1
2 Explain the terms sure event or
certain events, impossible events,
equally likely events and
their probabilities. P(sure event) =1, (impossible event) = 0 P(equally likely event) = ½

3 Explain the range of
probability $0 \leq P(E) \leq 1$ with the concept that the value of all probabilities lies between 0 and
.

4 Explain the method of writing the
sample space when we through one
coin, two coin and three coins and their probabilities in different situations. Also explain that
when certain number of coins are thrown
then possible outcomes are given by 2" •

5 Explain the method of writing the
sample space when we through one
die, two dice and their probabilities
in different situations. Also explain that when certain number of dice
are thrown then possible outcomes are given by 6".

6 Explain the terms associated with
the playing cards i.e. possible
outcomes, number of black(52) and
red(52) cards, number ace(4) and face(12) cards etc and their probabilities.

ART INTEGRATION: Teacher eill ask students to prepare the following activity

Total Playing Cards = 52
- No. of Black Cards = 26
  - No of Spade Cards = 13
  - No of Club Cards = 13
- No. of Red Cards = 26
  - No of Diamond Cards = 13
  - No of Heart Cards = 13

FEEDBACK AND REMEDIAL TEACHING
• Review questions given by the teacher.
• Students can prepare a
presentation on the sample space of different number of coins and dice.
 • Solve NCERT problems with examples,
• Solve the assignment given by the
teacher.

RESOURCES INCLUDING ICT;
Students can extend their learning through the RESOURCE CENTRE and can find more valuable and interesting
concepts on mathematics at cbsemathematics.com

INCLUSIVE PRACTICES & FULL PARTICIPATION:-
• Assignment sheet will be given as home work at the end of the topic.
• Separate sheets which will include questions of logical thinking and Higher
order thinking skills will be given to the above average students.
• Class Test, Oral Test , worksheet and Assignments will be given as the part of assessment.
• Re-test(s) will be conducted on the basis
of the performance of the students in the test.