Class IX

Subject : Mathematics

Chapter : 1

Topic : Number System

No. Of Days : 10

1. P.K. TESTING :-

This lesson requires

1. Basic knowledge of natural numbers, whole numbers, rational numbers, irrational numbers, real numbers.
2. Knowledge of basic construction and number line.
3. Knowledge of exponents.

2. LEARNING OUTCOME :-

KNOWLEDGE-Students will develop the ability to understand:

1. Natural numbers, whole numbers, integers, rational and irrational numbers.
2. The method of plotting square root of natural and decimal numbers on the number line.
3. The laws of exponents

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

- Smart board,
- Square root spiral of $\sqrt{2.5}$ with coloured paper

Material Required:-

Coloured paper / pens, scissors, geometry box, fevistick.

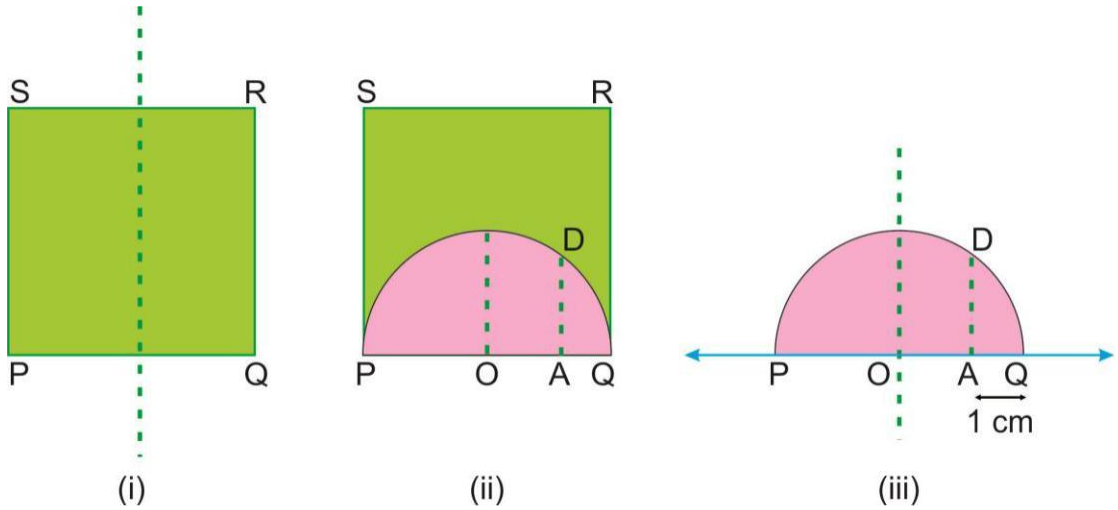
Procedure

(i) Take a coloured square paper f 3.5cm × 3.5cm and name it PQRS

(ii) Make a point A on PQ s.t PA = 2.5cm

(iii) Fold the square paper to find the center point of PQ

(iv) Draw a semicircle with centre O and radius = OP = OQ



(v) Fold the semicircle at vertex A st folded line must be perpendicular to PQ. Name it as AD.

(vi) Take replica of the semicircle and paste it on the line named *l*.

(vii) Cut the semicircle w.r.t ar AD (faded line)

(viii) Paste AD from figure 4 to figure 5 s.t D point lies on the line l as shown in figure 6.

(ix) AD point represents $\sqrt{2.5}$ on the no line.

4. PEDAGOGICAL STRATEGIES :-

Ppt and Digital Content would be shared

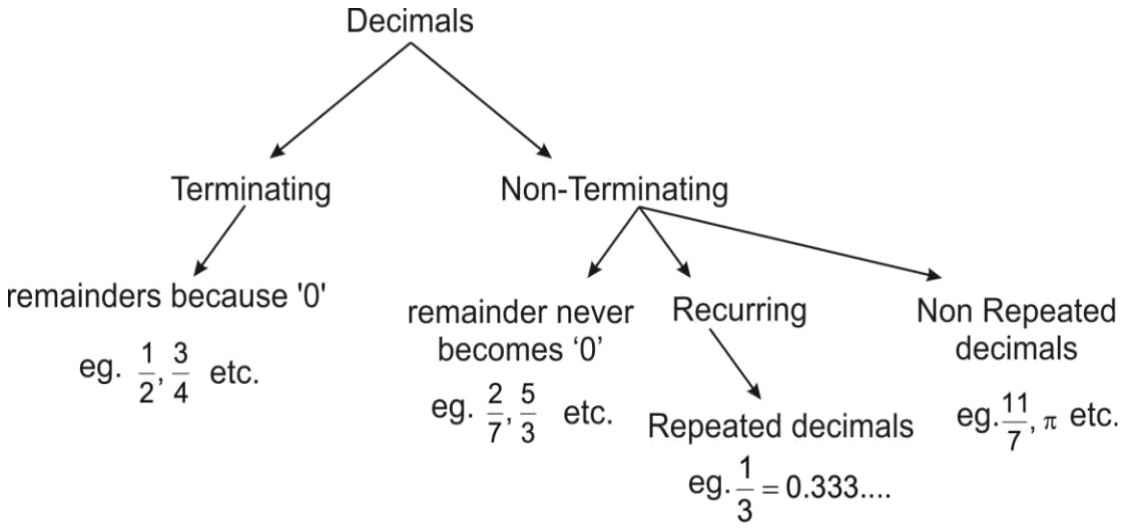
5. ART INTEGRATION :-

Charts representing square roots and real no's on Number line.
Presentation on the operations of various properties on real no's, the identities of square roots and the laws of exponents.

6. LIFE SKILL :-

Students would be able to critically apply the concepts in given situations and collaboratively realize the fact that infinite number of rational numbers can be inserted between two rational numbers.

7. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION :



6. ASSESSMENT

ASSIGNMENTS **:**

1. Express the 5.434343__ as a rational number in p/q form.
2. Write two examples each of two irrational numbers whose difference is a rational number and sum is irrational number.
3. Rationalize 3+√2 / 3√2.
4. Locate √10 on number line.
5. Represent √7.6 geometrically.
6. Solve 8⅓ X 16⅓ X 32⅓

7. 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:

- Spiral Level 1 to be completed
- Buddy help to be provided
- Provide grade-up classes

Class IX

Subject : Mathematics

Chapter : 2

Topic : Polynomials

No. Of Days: 15

1. P.K. TESTING:-

This lesson requires:
1. Basic knowledge of algebraic expression, terms, coefficient.
2. Knowledge of exponents.
3. Knowledge of equations and how to solve them.

2. LEARNING OUTCOME :-

Students will develop the ability to understand

1. The classification of polynomials on the basis of the number of terms and the degree.

2.The method of using zeroes in order to find whether a given polynomial is the factor of the other given polynomial or not.

3. Where and how to use factor theorem.

4. The method of using identities in order to find the product of two polynomials and in their factorization.

3. PEDAGOGICAL STRATEGIES :-

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

4. ART INTEGRATION :-

Make chart on Algebraic Identities

Activity Topic : Algebraic Identities

Objective : To verify the algebraic Identity

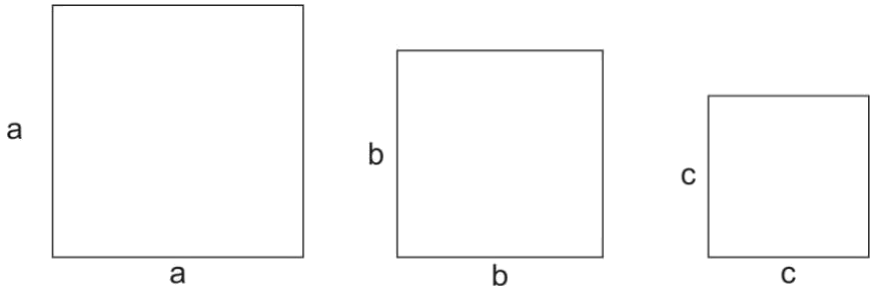
$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

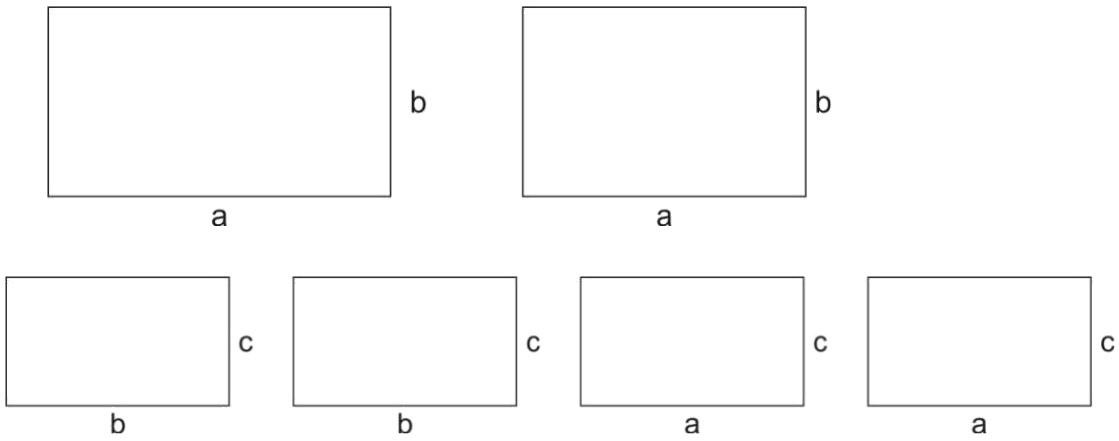
Prior Knowledge : Area of square = s × s
Area of rectangle = *l* × b

Material required : White drawing sheet, glazed sheets, cutter, sketch pens, fevistick

Procedure :-

Cut three spheres of side a unit, b unit and c unit (a > b > c) from a red paper.

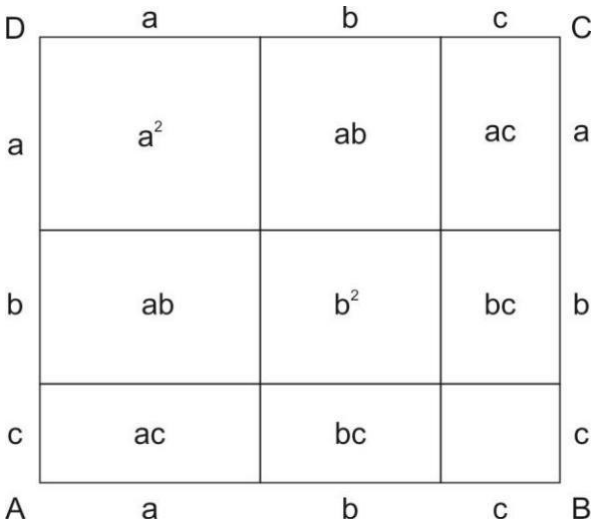




(i) Cut 2 rectangles of b × c units

(ii) Cut 2 rectangles of a × c units

(iii) Paste the above 9 quad. on the sheet as shown below.



Area of square = $(a + b + c)^2$

Area of all three squares and six rectangles

$= a^2 + b^2 + c^2 + ab + bc + bc + bc + ca + ca$

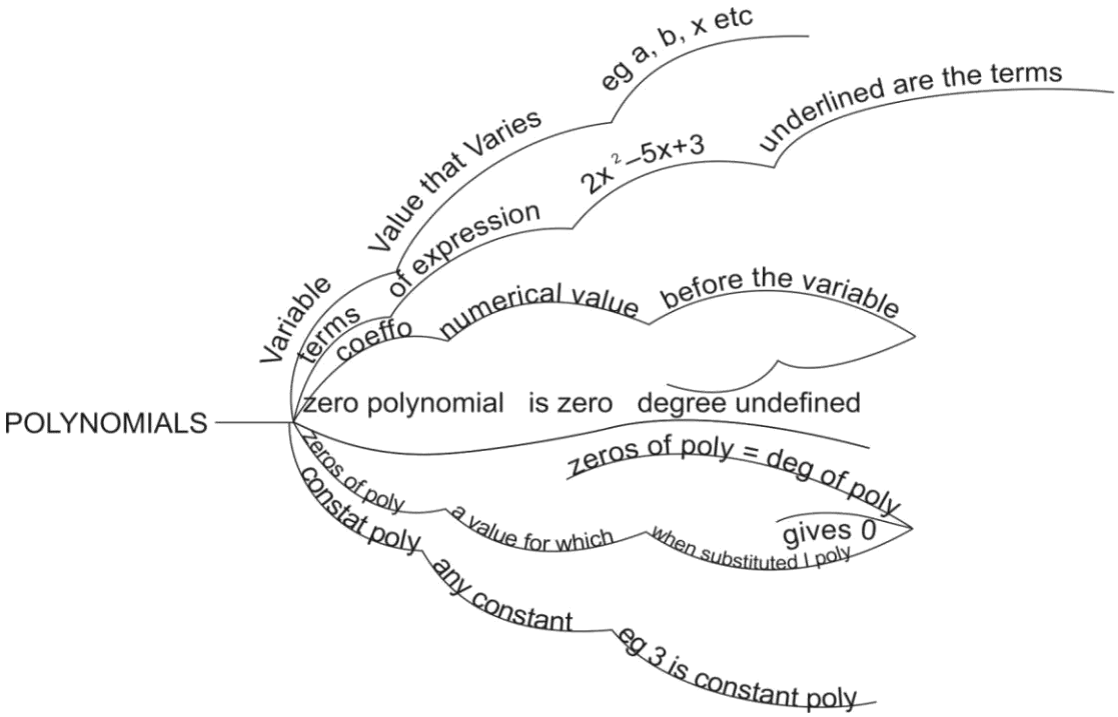
$= a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$

5. LIFE SKILL :-

- Students will be able to analyse the zeroes and factors of polynomials
- Students will be able to
  - Comprehend and Explain Algebraic Identities
  - Analyse the use of these algebraic identities to factorise the algebraic expressions and see their utility in computations.

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION :-

Students will be learning identities by heart.



7. ASSESSMENT

ASSIGNMENTS**:**

1. Find k if $2-x$ is a factor of $kx^2 - 2x + 1$.
2. If 1 and 3 are zeros of the polynomial p(x). Write the polynomial p(x).
3. Evaluate using appropriate identity: 104 x 96
4. Evaluate using the identity:
   (i) $15^3 - 10^3 - 5^3$.
   (ii) 99^3

8. INCLUSIVE PRACTIC 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

Class IX

Subject: Mathematics

Chapter: 3

Topic: Coordinate Geometry

No. Of Days: 3

1. P.K. Testing :-

1. Basic knowledge of x-axis and y-axis.
2. Knowledge of how to locate a point.

2. LEARNING OUTCOME :-

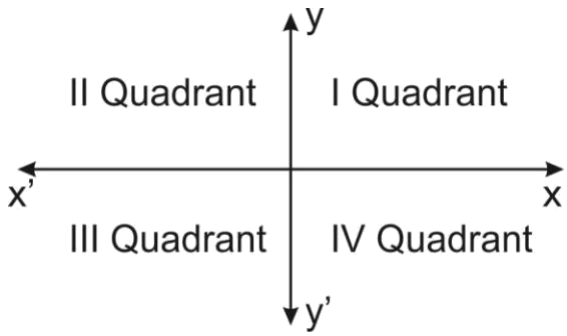
Students will develop the ability to understand
1. The Cartesian/co-ordinate plane.
2. The co-ordinate axes.
3. The quadrants and the sign of the co-ordinates of a point in different quadrants.
4. The meaning of origin.

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.

4. ART INTEGRATION :-

Graph Sheets, Audio Visual aids



5. LIFE SKILL :-

Students will be able to

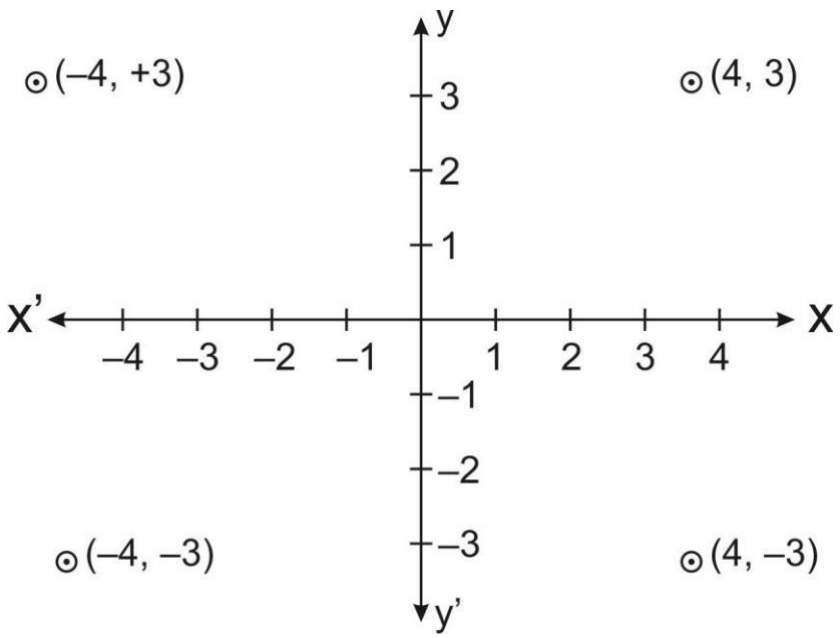
1. Locate and analyze the quadrant in which the given point lies.
2. Write the co-ordinates of the given point.
3. Plot a point if the x-axis and y-axis co-ordinate points are given, develop critical thinking and collaboration in the process.

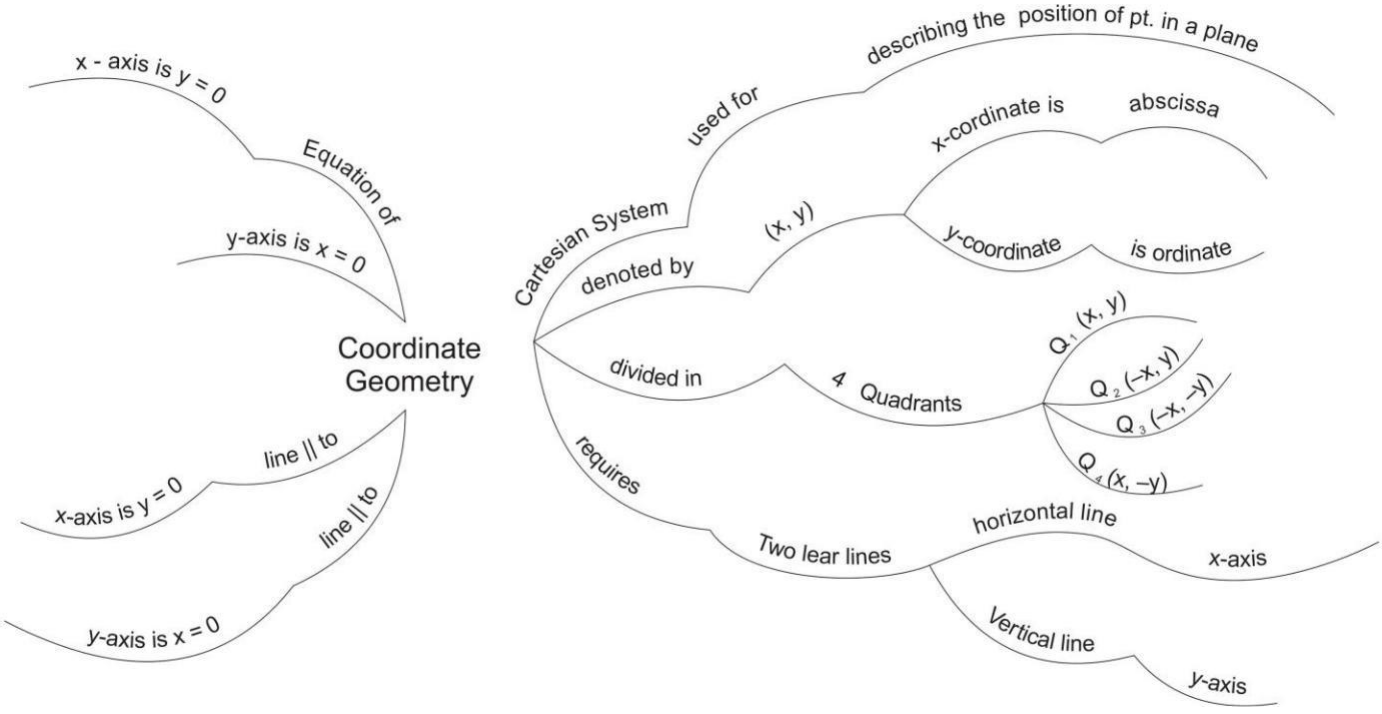
6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

The system of used for describing the position of a point in a plane is called Cartesian system. Developed by the French Mathematician Rene Descartes denoted by (x, y)

Fixed point is origin (0, 0), left of origin (–x, 0) is negative x-axis, right of origin is (x, 0), +ve x-axis, top of origin (0, y) is +ve y-axis and bottom of origin (0, –y) is –ve y-axis Cartesian Plane is divided into 4 parts known as quadrants.

The x-coordinate is called abscissa The y-coordinate is called ordinate





7. ASSESSMENT

ASSIGNMENTS **:-**

1. What is the ordinate of all points on x-axis?
2. The perpendicular distances of a point from x axis and y axis are 3 and 4 respectively. What are its coordinates?
3. In which quadrant or on which axis each of the points lie? A (8, −3), B (5, 2), C (7, −1)
4. Write the coordinates of the following: 4 units right to the origin and 3 units below origin.

8. 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 IX

Subject : Mathematics

Chapter : 4

Topic: Linear Equations in Two Variables

No. Of Days: 4

1. P.K. TESTING :-

(i) Define Linear Equations

(ii) Find out the solution for a linear Equation in one variable eg. $2x + 4 = 0$

2. LEARNING OUTCOME :-

Students would be able to:

(i) Understand standard form of a linear equation and write the values of a ,b and c.

(ii) To introduce the equation in two variables.

(iii) To focus on linear equations of the type $ax + by + c = 0$.

(iv) Explain that a linear equation in two variables has infinitely many solutions and justify their being written as ordered pairs of real numbers.

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:-

- What is an equation?
- What is the meaning of coefficient?
- What do you mean by linear?

Students will be asked to write different equation in one or two variables.

7. ASSESSMENT

ASSIGNMENTS**:-**

1. Find two solution of x+2y = 10.
2. Write four solutions of 5x + 2y –7= 0.
3. Find the value of a if (-1, 1) is a solution of the equation 3x–ay = -7.

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

Class IX

Subject: Mathematics
Chapter: 6

Topic: Lines & Angles

No. Of Days: 4

1. P.K. TESTING :-

This lesson requires:

1. Basic knowledge of angles and types of angles.
2. Knowledge of linear pair of angles and parallel lines.

2. LEARNING OUTCOME:-

Students would be able to:

1. Intersecting lines and non-intersecting lines.
2. Pairs of angles.
3. Parallel lines and a transversal.
4. Lines parallel to the same line.
5. Solve and analyze geometrical problems
6. Solve problems related to adjacent angles and linear pair.
7. Use the concept of various angles formed when a transversal intersects 2 parallel lines and their properties

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 would be studying.

4. ART INTEGRATION:-

Audio - Video aids and model.
To prepare ppt and chart

5. LIFE SKILL:-

Students will be able to identify the properties of the angles formed when 2 lines intersect each other and when a line intersects 2 or more parallel lines at distinct points. Students will also be able to use these properties to prove some statements, thereby inculcating competencies like collaboration, critical thinking and creativity

1. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

Recapitulation will be done

(i) Line is a collection of points.

(ii) A line has no end points

(iii) A line with two end points is line segment.

(iv) A line with one end point is a ray, denoted by

(v) If three or more than three points lying on the same line, then they are collinear points.

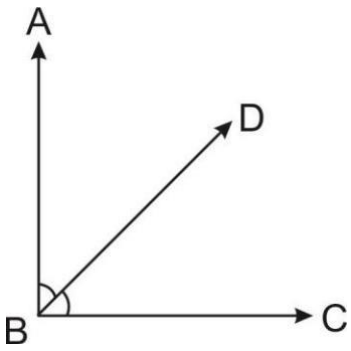
(vi) Any 3 non-collinear points form a triangle.

(vii) Angle is formed when two rays originate from the same end point, rays are called arms.

(viii) Two angles whose sum is 90^{o} are called complementary.

(ix) Two angles whose sum is 180^{o} are called supplementary.

(x) If 2 angles have common vertex and one common arm then they are adjacent



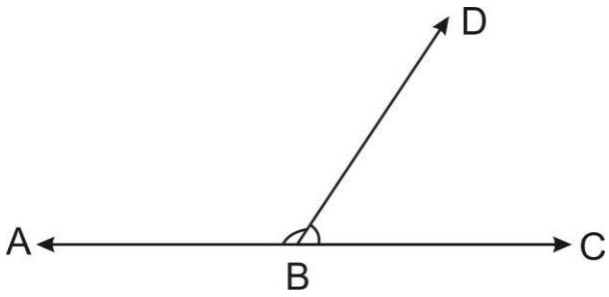
(xi) Sum of two adjacent angles is 180º then they are linear pair

(xii) Adjacent angles - ABD, DBC and

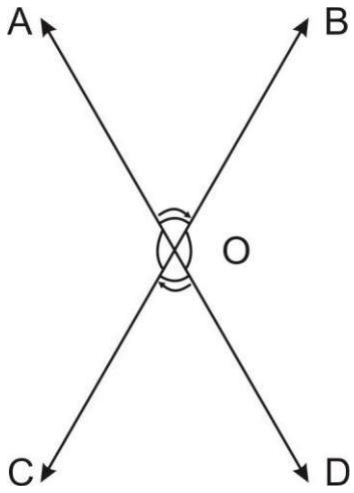
ABC ABD DBC

.

(xiii) If non common a arms from a straight line, ABD and DBC are called linear pair of angles.



(xiv) Vertically opposite Angles.



(xv) If a transversal intersect two parallel lines then

Each pair of corresponding angles is equal or each pair of alternate interior / exterior angles is equal any pair of interior angles on the same side of the transversal is supplementary then the lines are parallel.

2. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS**:**

1. Two lines AB and CD intersect at O if $\angle AOC = 115°$, Find $\angle AOD$
2. The sum of two angles of a triangle is70° and their difference is 30°. Find all the angles of the triangle.
3. The supplement of an angle is one third of itself. Determine the angle and its supplement.

3. INCLUSIVE PRACTICE 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 IX

Subject: Mathematics

Chapter: 7

Topic: Triangles

No. Of Days: 8

1. P.K. TESTING :-

This lesson requires

1. Basic knowledge of congruency and congruent figures.
2. Knowledge of various parts of a triangle.
3. Knowledge of types of triangles.
4. Knowledge of relation between exterior and interior of a triangle

2. LEARNING OUTCOME :-

1. Congruence of triangles.
2. Criteria for congruence of triangles.
3. Some properties of triangles.
4. Locate and identify the various criteria for the congruency.
5. Analyze the various criteria to check whether the given pair of triangles is congruent or not.
6. Use the rules of congruency in combination figures involving triangles.

3. PEDAGOGICAL STRATEGIES :-

Use of audio video Inductive Deductive Reasoning, Think pair, share.

4. ART INTEGRATION :-

To verify experimentally the different criteria for congruency of triangles using triangle cut outs.

5. LIFE SKILL :-

Students will know in detail about the congruence of triangles, will be able to identify the rules of congruence while proving the 2 triangles to be congruent, will learn more properties of triangles. Thereby inculcating competencies like collaboration, critical thinking and creativity

6. FEEDBACK AND REMEDIAL TEACHING RECAPITULATION:-

a) Two figures are congruent, (equal in all aspects i.e. shape, size etc), if they are of the same shape and of save size. e.g. circles of same radii, squares of same sides.

b) Concept of congruent triangles

c) Properties of triangles

7. ASSESSMENT

Techniques to be used:
Quiz
Daily Practice Problem
MCQ
Peer Assessment
Case Studies
Lab Activities

ASSIGNMENTS**:-**

1. In ΔPQR, $\angle Q = 40°$and PQ = PR. Find $\angle P$ and $\angle R$.
2. In triangle QSR sides SQ and RS are produced to points T and P resp. Such that $\angle TQR = 125°$ and $\angle PSQ = 100$ find $\angle SRQ$.
3. Prove that sides opposite to equal angles of triangle are equal.
4. Prove that the angles opposite to equal sides of triangle are equal.
5. PQR is a triangle in which PQ = PR and S is any point on the side PQ. Through S, a line is drawn parallel to QR and intersecting PR at T. Prove that PS = PT

8. 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