

**1.0. Brief review of geometry:**

**1.1 Straight Line and Angles:**

**1.2 Parallel Straight Lines**

**1.3 Polygon:**

**1.4 Quadrilateral:**

**I. Parallelogram: A.**

**Rectangle: Rhombus: Square: Miscellaneous results on Parallelograms:**

**II. Trapezium:**

**III. Kite:**

**IV. Cyclic Quadrilateral:**

**1.5 Triangle:**

**Similar Triangles: Some Theorems on Similarity of triangles**

**Concurrence of Triangles: Some Theorems on congruence of triangles**

**Centroid of triangle: Incentre: Orthocenter: Circumcentre:**

**2.0 What is co-ordinate or Analytical Geometry?**

**3.0 Co-ordinate Axes:**

**3.1 Distance formula:**

**3.2 Section formula:**

**4.0 A brief introduction to determinants:**

**Properties of determinants:**

**1. Reflection Property 2. All-zero Property 3. Proportionally (Repetition) Property**

**4. Switching Property 5. Scalar Multiple Property 6. Sum Property**

**7. Property of Invariance 8. Factor Property 9. Triangle Property**

**5.0 Area of triangle:**

**5.1 Area of a quadrilateral:**

**5.2 Collinearity of three points**

**i. Area of the triangle formed by the three points.**

**ii. Slope of line joining any pair of points is equal.**

**6.0 Centers of a triangle**

**Centroid: Incentre: Important points to note:**

**7.0 Locus:**

**8.0 Straight Line**

**Definition: Inclination of a line: Slope (or Gradient) of a line : Slope formula:**

**8.1 Equation of Straight Line in Slope intercept form**

**8.2 Equation of Straight Line in Double intercept form**

**8.3 Equation of Straight Line in Perpendicular form**

**8.4 Equation of Straight Line in Point-Slope form**

**8.5 Equation of Straight Line in Two Point form**

**8.6 Equation of Straight Line in Parametric form**

**8.7 Equation of Straight Line in Determinant form**

**8.8 Equation of Straight Line in General Form**

**8.9 Conversion of Equation of Straight Lines to Different Forms**

**I. Slope – intercept form: II. Double Intercept form: III. Normal form:**

**8.10 Miscellaneous Problems Involving Equations of Straight Line**

**9.0 Angle between Two Lines**

**9.1 Condition for two lines being parallel**

**Equation of a line parallel to a given line**

**9.2 Condition for two lines being perpendicular**

**Equation of a line perpendicular to a given line**

**9.3 Equations to the straight lines, which pass through a given point,  $(x', y')$ , and makes a given angle  $\alpha$  with the given straight line**

**10.0 Point of intersection of two lines**

**10.1 Concurrency of three lines**

**First Method: Second Method:**

**10.2 Area of Triangle formed by three given lines**

**11.0 position of a point w.r.t. a line**

**11.1 Distance of a point from a line**

**11.2 Reflection about a straight line**

**12.0 Angle Bisectors of two lines**

**12.1 Identifying angle bisectors of acute, obtuse angle and the part containing origin**

**Working rule for identifying the bisector of the angle of the part containing origin**

**Working method to find bisector of acute angle and obtuse angle between two lines**

**Other methods to identify bisector of acute angle and obtuse angle**

**12.2 Bisectors of internal and external angles of a triangle**

**13.0 Family of straight lines:**

**Type I:** Problems which involve finding a straight line passing through intersection of two given lines

**Type II** Problems which involves proving that a line will always pass through a fixed point

**Type III**

**14.0 Pair of Lines**

**14.1 Condition for second degree equation  $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$  representing pair of straight line.**

**14.2 Condition for second degree homogeneous equation  $ax^2 + 2hxy + by^2 = 0$  representing pair of straight line.**

**14.3 Angle between lines represented by equation  $ax^2 + 2hxy + by^2 = 0$**

Condition for the lines to be coincident:      Condition for the lines to be perpendicular:

**14.4 Angle between lines represented by equation  $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$**

**14.5 Equation of bisectors of the angle between the lines represented by  $ax^2 + 2hxy + by^2 = 0$**

**14.5 Equation of bisectors of the angle between the lines represented by  $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$**

**15.0 Concept of Homogenization**