ChatGPT

Mathematics Class 9 (Federal/Punjab Board) – Selected Theorems (Chapters 10–16)

Theorem Name	Statement
Theorem 10.1:	If two angles and non-included side of one triangle are congruent to the corresponding angles and non-included side of another triangle, then two triangles are congruent.
Theorem 10.2:	If two angles of a triangle are congruent, then the sides opposite to them are also congruent.
Theorem 10.3 Statement:	In the correspondence of two triangles, if three sides of one triangle are congruent to the corresponding three sides of the other, the two triangles are congruent.
Theorem 10.4 Statement:	If in the correspondence of two right-angled triangles, the hypotenuse and one side of one are respectively congruent to the hypotenuse and corresponding side of the other, the triangles are congruent.
Theorem 11.1 Statement:	In a parallelogram: i) Opposite sides are congruent; ii) Opposite angles are congruent; iii) Diagonals bisect each other.
Theorem 11.2 Statement:	If two sides of a quadrilateral are congruent and parallel, it is a parallelogram.
Theorem 11.3:	The line segment joining the midpoints of two sides of a triangle is parallel to the third side and equal to one half of its length.
Theorem 11.4 Statement:	The medians of a triangle are concurrent and their point of concurrency is the point of trisection of each median.
Theorem 11.5:	If three or more parallel lines make congruent intercepts on a transversal, they also intercept congruent segments on the other line that cuts them.
Theorem 12.1:	Any point on the right bisector of a line segment is equidistant from its end points.
Theorem 12.2 Statement:	Any point equidistant from the end points of a line segment is on the right bisector of it.
Theorem 12.3 Statement:	The right bisectors of the sides of the triangle are concurrent.
Theorem 12.4:	Any point on the bisector of an angle is equidistant from its arms.
Theorem 12.5:	Any point inside the angle, equidistant from its arms, is on its bisector.
Theorem 12.6:	The bisectors of the angles of the triangle are concurrent.
Theorem 13.1:	If two sides of the triangle are unequal in length, the longer side has an angle of greater measure opposite to it.

Theorem Name	Statement
Theorem 13.2:	If two angles of the triangle are unequal in measure, the side opposite to the greater angle is longer than the side opposite to the smaller angle.
Theorem 13.3:	The sum of lengths of any two sides of a triangle is greater than the length of the third side.
Theorem 13.4:	From a point outside the line, the perpendicular is the shortest distance from the point to the line.
Theorem 14.1:	A line parallel to the one side of the triangle, intersecting the other two sides, divides them proportionally.
Theorem 14.2:	If a line segment intersects the two sides of a triangle in the same ratio, then it is parallel to the third side.
Theorem 14.3:	The internal bisector of an angle of a triangle divides the side opposite to it in the ratio of the lengths of the sides containing the angle.
Theorem 14.4:	If two triangles are similar, then the measures of their corresponding sides are proportional.
Theorem 15.1 Statement:	In a right-angled triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides.
Theorem 15.2 Statement:	If the square of one side of a triangle is equal to the sum of the squares of the other two sides, then the triangle is a right-angled triangle.
Theorem 16.1 Statement:	Parallelograms on the same base and lying between the same parallel lines (or having the same altitude) are equal in area.
Theorem 16.2:	Parallelograms on equal bases and of the same altitude are equal in area.
Theorem 16.3 Statement:	Triangles on the same base and the same altitude are equal in area.
Theorem 16.4 Statement:	Triangles on equal bases and the same altitude are equal in area.