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

| **Theorem Name** | **Statement** |
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| **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 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. |
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