201ST HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Friday, June 10, 1910—9.15 a. m. to 12.15 p. m., only

Write at the top of the first page of your answer paper (*a*) the name of the school where you have studied, (*b*) the number of weeks and recitations a week that you have had in geometry.

Five recitations a week for a school year, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions, selecting two from each group.

Group I 1 Prove that the sum of the interior angles of any triangle is equal to two right angles.

2 Prove that the angle between two tangents from a point to a circle is bisected by the line joining the point with the center of the circle.

3 Prove that the line which bisects one leg of a trapezoid and is parallel to the bases is equal to half of the sum of the bases.

Group II 4 Prove that the angle between two secants is measured by half the difference of the intercepted arcs.

5 Prove that the areas of two similar triangles are to each other as the squares of any two homologous sides.

6 Prove that the area of a circle is equal to the circumference multiplied by half the radius.

Group III 7 In a circle whose radius is 10 inches find the area of a segment of 60°.

8 The centers of two circles, whose radii are 8 inches and 3 inches respectively, are 13 inches apart; find the length of their common external tangent.

9 The sides of a triangle are 13 inches, 14 inches and 15 inches; find the altitude on the longest side.

Group IV 10 Prove that a circumference drawn on one side of an equilateral triangle as a diameter bisects the other two sides of the triangle.

11 Show how to construct a circle passing through a given point and tangent to a given circle at a given point.

12 Show how to construct a triangle having given two sides and the angle opposite one of them if the given angle is acute.