194TH HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Tuesday, January 28, 1908—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting two from each group.

Group I 1 Prove that angles whose corresponding sides are parallel are either equal or supplementary.

2 Prove that the bisector of a given angle is the locus of points equidistant from the sides of the angle.

3 Prove that if two lines are drawn from a point to the extremities of a straight line, their sum is greater than the sum of two other lines similarly drawn but included by them.

Group II 4 Prove that if the middle points of the adjacent sides of any quadrilateral are joined by straight lines the figure thus formed will be a parallelogram.

5 Show how to construct a tangent to a given circumference from a point without the circumference.

6 Prove that two triangles having an angle of one equal to an angle of the other, are to each other as the products of the sides including the equal angles.

Group III 7 Three consecutive sides of an inscribed quadrilateral subtend arcs of 70°, 85° and 98° respectively; find each angle of the quadrilateral and the angle between its diagonals.

8 The diameters of two concentric circles are 16 feet and 40 feet respectively; find the length of a chord of the greater circle which is tangent to the smaller.

9 The area of a rhombus is 96 square feet and its side is 10 feet; find the lengths of its diagonals.

Group IV 10 Show how to inscribe a circle in a given sector.

11 Show how to divide a triangle into two equivalent parts by a line parallel to one of its sides.

12 Prove that the tangents to two intersecting circles from any point in their common chord produced are equal.