New York State Education Department 9.17

206TH HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Tuesday, January 16, 1912—9.15 a. m. to 12.15 p. m., only

Write at top of first page of answer paper (*a*) name of school where you have studied, (*b*) number of weeks and recitations a week in plane geometry. The minimum time requirement is five recitations a week for a school year.

Answer eight questions, selecting two from each group.

Group I

1 State (*a*) *three* theorems for proving that two scalene triangles are equal in all respects, (*b*) *two* theorems for proving that two right triangles are equal in all respects.

2 Complete and demonstrate the following: An angle formed by a secant and a tangent meeting in an external point is measured by . . .

3 Prove that the area of a parallelogram is equal to the product of its base by its altitude.

Group II

4 Prove that if two sides of a quadrilateral are equal and parallel, the figure is a parallelogram.

5 If a, b and c represent three straight lines, construct a line x so that $x = \frac{ac}{b}$. Give proof.

6 Prove that two mutually equiangular triangles are similar.

Group III

7 The radius of a circle is 8 feet; find the area of an inscribed equilateral triangle.

8 A rectangle whose altitude is 8 feet and whose area is 96 square feet is inscribed in a circle; find the diameter of the circle.

9 The area of a sector is 72π, the angle of the sector is 80°; find the radius of the sector.

Group IV

10 Construct a right triangle, given one leg and the altitude on the hypotenuse.

11 Prove that if from any point in the circumference of a circle a chord and a tangent are drawn, the perpendiculars to them from the middle point of the lesser arc are equal.

12 ABC is an isosceles triangle inscribed in a circle; the vertical angle B is 30° and D is the middle point in the arc BC. If the line AD intersects the chord BC at E, how many degrees are there in the angles DEC and BED?