University of the State of New York

187TH HIGH SCHOOL EXAMINATION

PLANE GEOMETRY

Wednesday, September 27, 1905—9.15 a. m. to 12.15 p. m., only

---

*Answer six questions but **no more,** including at least one from each of the three divisions. Each complete answer will receive 16⅔ credits. Papers entitled to 75 or more credits will be accepted.*

First division

1 Prove that the sum of the three angles of a triangle is equal to two right angles.

2 Prove that if two circles intersect, the line of centers is perpendicular to their common chord at its middle point.

3 Complete and demonstrate the following: If two chords intersect in a circle. . .

Second division

4 The sides of a triangle are respectively 6 inches, 8 inches and 12 inches; find the perimeter of a similar triangle whose shortest side is 5 inches.

5 In a triangle the sides are 29 inches, 25 inches and 6 inches respectively; find the projections of the other sides of the triangle on the shortest side produced.

6 The radius of a circle is 8 feet, the angle at the center is 30°; find the area of the segment cut off by the chord of the angle at the center.

Third division

7 Draw two circles so that they may have (*a*) two common external tangents and no common internal tangent, (*b*) two common external and two common internal tangents, (*c*) one common external and no common internal tangent, (*d*) no common tangent.

8 Show how to construct a rhombus having given one side and a diagonal.

9 Prove that the area of the square described on the altitude of an equilateral triangle is three times that of the square on one half of one side of the triangle.

10 Prove that if the diagonals of a trapezoid are equal the trapezoid is isosceles.