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University of the State of New York

Examination Department

131st examination

PLANE GEOMETRY

Wednesday, June 12, 1895 — 9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

Answer 10 questions but **no more.** *If more than 10 questions are answered only the first 10 of these answers will be considered. Division of groups is not allowed. Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically. Each complete answer will receive 10 credits.*

1 Define and illustrate *obtuse angle, inscribed angle, sector of a circle, tangent, hypothesis.*

2–3 Prove that the side of a regular hexagon is equal to the radius of the circumscribed circle.

4–5 Prove that the areas of similar triangles are to each other as the squares of their homologous sides.

6–7 Prove that in equal circles a greater arc is subtended by a greater chord, and the converse.

8–9 Find the ratio of the areas of two regular triangles, one inscribed in a circle and the other circumscribed about it.

10 Find the weight of the largest circular disk that can be cut from a square sheet of metal weighing 10 pounds.

11 Construct a circle equal in area to the sum of two given circles.

12 In a circle whose radius is 6 feet, find the area of a segment whose arc is 60°.

13 Show how to construct a circle of given radius and passing through two given points.

14 Show how to construct a triangle equal in area to any given polygon.

15 Show how to construct a third proportional to two given lines.