23
University of the State of New York

Examination Department

124th examination

PLANE GEOMETRY

August 1894—Three hours, only

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100 *credits, necessary to pass,* 75

Answer 10 questions but **no more.** *Division of groups is not allowed. If more than 10 questions are answered only the first 10 of these answers will be considered. 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 *acute angle, scalene triangle, rhombus, sector, inscribed polygon.*

2–3 State and demonstrate a theorem regarding the segments of one side of a triangle made by the bisector of the opposite angle.

4–5 Complete and demonstrate the following theorem : In any triangle the square of a side opposite an acute angle is equal to . . .

6–7 Prove that angles at the center of a circle are proportional to the arcs intercepted by their sides. (Two cases.)

8 Show how to construct a circle whose area shall be double that of a given circle.

9 Find the area of a regular hexagon whose side is 10 feet.

10 Show how to construct a tangent to a given circle which shall pass through a given point outside the circumference.

11 In a circle whose radius is 12· feet what is the area of a sector whose arc is 30°?

12–13 Show how to construct a triangle when two sides and one angle are given. (Give two cases.)

14 The shortest distance from a given point to the circumference of a given circle is 4 feet, the length of a tangent from the same point to the same circumference is 6 feet ; find the diameter of the circle.

15 Show how to construct a polygon similar to a given polygon and double its area.