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University of the State of New York

Examination Department

127th examination

PLANE GEOMETRY

Wednesday, January 23, 1895 — 9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

Answer questions 1-5 and five of the others but **no more.** *If more than five of these other questions are answered only the first five 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 *each* of the following: *perimeter, supplement of an angle, scalene triangle, tangent, rhombus.*

2–3 State and demonstrate the relation existing between the areas of any two rectangles.

4–5 Prove that the side of a regular hexagon is equal to the radius of the circumscribed circle.

6 Prove that if two angles of a triangle are equal the sides opposite them are equal.

7 Given the base, one of the other sides and the altitude of a triangle, to construct the triangle.

8 The sum of all the interior angles of a regular polygon is 12 right angles; how many sides has it? (Give all the work.)

9–10 The sides of a triangle are 5 feet, 5 feet and 6 feet; find the diameter of the circumscribed circle.

11 Construct a line whose length shall be to the length of a given line as $\sqrt{2} : 1$.

12–13 In a circle whose radius is $7\frac{1}{2}$ feet chords are drawn from the extremities of a diameter to a point in the circumference, and from this point a perpendicular is let fall to the diameter. The length of one of the chords is 9 feet. Find the length of the other chord, of the perpendicular and of each segment of the diameter.

14–15 Construct a circle which shall be tangent to a given circle and also to a given straight line at a given point.