

University of the State of New York

Examination Department

119th examination

PLANE GEOMETRY

Wednesday, March 14, 1894 — 9:15 a. m. to 12:15 p. m., only

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 scalene triangle, plane figure, diagonal, similar polygons, corollary.

2-3 State three theorems in which the conclusion of each is . . . *the two triangles are similar*. Demonstrate one of the theorems stated.

4 The base of a triangle is 10 ft and the other sides 8 ft and 12 ft; find the segments of the base made by the bisector of the vertical angle, and state the theorem employed.

5-6 State and demonstrate the relation between the diagonal and the side of a square. Find the side of a square whose diagonal is 12 ft.

7 State and demonstrate the relation existing between the segments of two chords which intersect within a circle.

8 Prove that the sum of the three angles of any triangle is equal to two right angles.

9 What is the measure of an inscribed angle? Prove the correctness of your answer.

10 Show how the distance across an impassable stream may be determined from measurements made on its bank.

11 Find an expression for the area of an equilateral triangle in terms of one of its sides.

12 Find the number of different diagonals that can be drawn in an inscribed polygon of n sides.

13 With a given radius construct the circumference of a circle passing through two given points.

14-15 Show how to construct a mean proportional between two given lines and prove the correctness of your construction.