

University of the State of New York

Examination Department

134TH EXAMINATION

PLANE GEOMETRY

Wednesday, January 29, 1896 — 9:15 a. m. to 12:15 p. m., only

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 *tangent, secant, diagonal, polygon, proposition.*

2-3 State one conclusion of the following: If from the vertex of a right triangle a perpendicular is let fall on the hypotenuse . . . Give proof.

4-5 Prove that the area of any triangle is one half that of a rectangle having the same base and altitude.

6-7 Construct a square equal to the sum of two given squares. Give proof.

8 In a triangle the side AB is 7 feet, AC is 5 feet, and BC 6 feet; find the segments of BC made by the bisector of the angle A. State the principle involved.

9 Show how to construct an isosceles triangle having given the base and the radius of the inscribed circle.

10 The length of a tangent drawn from a certain point to the circumference of a circle is 8 feet, the shortest distance from the same point to the circumference is 4 feet; find the radius of the circle.

11-12 Construct a circle tangent to two given circles and at a given point of one of them.

13 Write the formula for finding *each* of the following: (a) the area of a circle whose radius is r , (b) the area of the ring between two concentric circles whose radii are R and r , (c) the area of an equilateral triangle whose side is s , (d) the area of a regular hexagon whose side is s , (e) the area of a square inscribed in a circle whose radius is r .

14 Show how to construct a mean proportional between two given lines.

15 Construct a triangle having given the base, the altitude and one of the other sides.