

University of the State of New York

## Examination Department

126th examination

### PLANE GEOMETRY

Wednesday, November 28, 1894—9 : 15 a. m. to 12 : 15 p. m., only

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100 credits, necessary to pass, 75

Answer the first five questions and five of the others but **no more**. If more than five of these 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 *tangent, segment, polygon, radius, complement of an angle*.
- 2-3 Prove that a radius which is perpendicular to a chord (*a*) bisects the chord, (*b*) bisects the arc subtended by the chord.
- 4 Show how to divide a given line into any number of equal parts. Prove the correctness of your work.
- 5 Prove that two circumferences have the same ratio as their radii.
- 6-7 The square on the hypotenuse of a right triangle is equivalent to the sum of the squares on the other two sides.
- 8 Find the area of an equilateral triangle which is inscribed in a circle whose radius is 12 feet.
- 9 The sides of a triangle are 16 feet, 16 feet and 24 feet; find the area of the triangle.
- 10 Show how to construct a triangle similar to a given triangle but double its area.
- 11 Two parallel chords in a circle are each eight feet in length and the distance between them is six feet; find the radius of the circle.
- 12-13 Show how to construct with a given radius a circle tangent to two given lines. State the conditions under which this construction is impossible.
- 14-15 The longer side of a certain parallelogram is twice the length of the shorter side and the sum of the squares of its diagonals is 90; find the length of each side.