University of the State of New York

Examinations Department

Special examination

PLANE GEOMETRY

Wednesday, September 23, 1891—9:15 a. m. to 12:15 p. m., only

40 *credits, necessary to pass,* 30

1. Define and represent by a figure each of the following: (*a*) adjacent angles; (*b*) an inscribed angle; (*c*) a mean proportional; (*d*) equivalent figures; (*e*) the apothem of a polygon. 5

2. How many sides has a polygon, if the sum of its interior angles equals three times the sum of the angles of a pentagon? 3

3. The difference between the two angles of a parallelogram adjacent to one of its sides is 60°. Find each angle of the parallelogram. 3

4. Prove that two angles whose sides are parallel each to each are either equal or supplementary. State when the angles are equal, when supplementary. 6

5. Prove that two mutually equiangular triangles are similar. 4

6. Prove that the area of a circle equals one-half the product of the radius and circumference. 4

7. Draw the following and prove the correctness of each construction:

(*a*) A perpendicular at a given point near the extremity of a given line. 3

(*b*) A triangle, having given two sides and one angle. 3

(*c*) A square equivalent to the sum of two given squares. 4

8. The area of a triangle is 875 square feet. Find its base and altitude if they are in the ratio of 14 to 5 respectively. 3

9. The homologous sides of two similar polygons are 15 feet and 25 feet respectively. If the area of the first polygon is 450 square feet, what is the area of the second? 2