University of the State of New York

Examinations Department

79th examination

PLANE GEOMETRY

Wednesday, Jan. 27, 1892—9 : 15 a. m. to 12 : 15 p. m., only

40 *credits, necessary to pass*, 30

NOTE.—Draw carefully and neatly each figure in construction or proof, using letters instead of numerals. Arrange work logically.

1. Define and illustrate (*a*) oblique angle ; (*b*) a third proportional ; (*c*) tangent circles.   6

2. An exterior angle of a regular polygon equals one-fifth of a right angle ; find the number of sides of the polygon.   4

3. Prove that a straight line perpendicular to a radius at its extremity is tangent to the circle.   4

4. Prove that if in a right triangle a perpendicular is drawn from the vertex of the right angle to the hypotenuse : I. The perpendicular is a mean proportional between the segments of the hypotenuse. II. Each side about the right angle is a mean proportional between the hypotenuse and the adjacent segment.   6

5. Prove that two regular polygons of the same number of sides are similar.   4

6. Solve the following and prove the correctness of each construction :

(*a*) Through a given point to draw a tangent to a given circle. (Two cases.)   6

(*b*) At a given point in a given line to construct an angle of 30°.   4

7. The sides of a rectangle inscribed in a circle are *m* and *n ;* find (*a*) the circumference of the circle ; (*b*) its area.   6