University of the State of New York

Examinations Department

80th examination

SOLID GEOMETRY

Friday, March 18, 1892—1:15 to 4:15 p. m., only

40 *credits, necessary to pass,* 30

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

1. Define (*a*) parallel planes; (*b*) polyhedral angle; (*c*) oblique prism; (*d*) regular pyramid; (*e*) similar cones; (*f*) spherical segment. 6

2. Can the position of a plane be determined by a given point and a line not including the point? Give the reason for your answer. 2

3. Are two lines in space necessarily parallel to each other when each is perpendicular (*a*) to a given third line; (*b*) to a given plane? Give the reason for each answer. 4

4. Prove that the sum of two face-angles of a trihedral angle is greater than the third. 6

5. Prove that two rectangular parallelopipeds having equal altitudes are to each other as their bases. 6

6. Prove that the area of the surface of a sphere is equal to the product of its diameter by the circumference of a great circle. 6

7. Find in cubic feet the volume of the largest square beam which can be made from a log in the form of a right cylinder, 40 feet long and 2 feet in diameter. 4

8. The dimensions of a rectangular pyramid are *a*, *b* and *c*; find the altitude of an equivalent right cone, having *a* for the diameter of its base; also find the radius of an equivalent sphere. 6