

University of the State of New York
Examination Department

128th examination
SOLID GEOMETRY

Friday, March 15, 1895—1:15 to 4:15 p. m., only

100 credits, necessary to pass, 75

Answer questions 1-5 and five of the others but no more. If more than five of these other 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 *cylindric surface, frustum, pyramid, surface of revolution, dihedral angle.*

2 How many points are required to determine the position of a plane? Give proof.

3-4 Prove that a line perpendicular to each of two lines at their intersection is perpendicular to the plane of those lines.

5 Prove that any section of a sphere made by a plane is a circle.

6-7 Prove that through any four points not in the same plane one spheric surface may be made to pass and but one.

8-9 A hollow iron column 15 feet long, whose outer diameter is 8 inches, weighs 1835 pounds; find its thickness. (Assume one cubic foot of iron weighs 468 lbs.)

10 Find an expression for the volume of a cube inscribed in a sphere whose radius is r .

11-12 Complete and demonstrate the following: The area of the surface generated by a straight line revolving about an axis in its own plane is equal to . . .

13 Show how to divide a cone into two equivalent parts by a plane parallel to its base.

14 Show how to construct a plane tangent to a sphere and containing a given line outside the sphere.

15 The diameter of the base of a cone is 2 feet and the altitude is 6 feet; find the volume of a square pyramid inscribed in this cone.