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*University of the State of New York*

# Examination Department

119th examination

## SOLID GEOMETRY

**Friday**, March 16, 1894—1 : 15 to 4 : 15 p. m., only

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100 *credits, necessary to pass,* 75

*Answer 10 questions but* no more. *Division of groups is not allowed. If more than 10 questions are answered only the first 10 of these answers will be considered. 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 Prove that if two parallel planes are intersected by a third plane the lines of intersection will be parallel.

2 Prove that the sum of any two of the plane angles formed by the edges of a triedral angle is greater than the third.

3–4 Prove that a triangular prism may be divided into three equal triangular pyramids.

5–6 Name and describe the regular polyedrons. Show that there can be no more.

7 Derive the formula for the convex surface of a right pyramid and show that this formula applies to the cone also.

8–9 Prove that any two rectangular parallelopipeds are to each other as the products of their three dimensions.

10–11 Derive a formula for the convex surface of a sphere.

12–13 Find the volume of a regular tetraedron whose edge is 10 ft.

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

15 In a sphere whose radius is 10 ft there is inscribed a right cone whose altitude is 15 ft. Find the volume of the cone.