University of the State of New York.

36TH ACADEMIC EXAMINATION.

SOLID GEOMETRY.

MONDAY, January 20, 1890—Time, 1:30 to 4:30 P. M., only.

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32 credits, necessary to pass, 24.

1. Define cube ; cylinder ; frustum of a pyramid ; radius of a sphere ; axis of a cone ; dihedral angle 6

2. Prove that if two angles not situated in the same plane have their sides parallel and lying in the same direction, the angles will be equal and their planes parallel........................ 3

3. Prove that two rectangular parallelopipeds having equal altitudes are to each other as their bases.................. 2

4. Prove that two triangular pyramids having equal bases and equal altitudes are equal in volume.................... 3

5. Prove that the volume of a frustum of any triangular pyramid is equal to the sum of the volumes of three pyramids whose common altitude is that of the frustum, and whose bases are the lower base of the frustum, the upper base of the frustum, and a mean proportional between the two bases 5

6. Prove that the surface of a sphere is equal to its diameter multiplied by the circumference of a great circle.............. 2

7. Give the formula for finding each of the following : volume of a pyramid ; volume of the frustum of a pyramid ; convex surface (lateral area) of a cylinder ; volume of a cone ; volume of a sphere 5

8. Find the surface of a rectangular parallelopiped, the dimensions of whose base are 2 feet and 5 feet, and whose volume is 40 cubic feet 2

9. Find the lateral area and volume of a regular hexagonal prism, each side of whose base is 1 foot, and whose altitude is 10 feet 4