University of the State of New York

Examinations Department

80th examination

ADVANCED ALGEBRA

Monday, March 14, 1892—9 : 15 a. m. to 12 : 15 p. m., only

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40 *credits*, *necessary to pass*, 30

NOTE.—Give all operations (except mental ones). Reduce each result to its simplest form and mark it *Ans.*

1. Define and illustrate finite series, infinite series. 4

2. Simplify $\left(2 \pm \sqrt{(-3)^3}\right) - \left(-1 \pm \sqrt{(-3)^4}\right)$ 4

3. Derive the two fundamental formulas used in solving questions in arithmetic progression. Show that these formulas enable us to find any two of the quantities a, d, l, n, s, when the other three are given. 6

4. Find the scale of relation and the sum of the recurring series $1 + 3x + 5x^2 + 7x^3 + 9x^4 + \ldots$. 6

5. Convert $\frac{1+x}{1-x}$ into a series, using the method of undetermined coefficients, and verify by division. 6

6. From the equation $a^x = \frac{b^2 d}{c^3}$, find the value of x in terms of the logarithms of a, b, c and d. 6

7. Transform the equation $x^3 + 3x^2 - 4x - 12 = 0$ into another which wants the second term. 4

8. The roots of the following equation are all real; how many of them are positive, how many negative: $x^4 - 2x^3 - 13x^2 + 38x - 24 = 0$? Give reasons for your answer. 4