University of the State of New York

Examinations Department

79th examination

ADVANCED ALGEBRA

Monday, Jan. 25, 1892—9 : 15 a. m. to 12 : 15 p. m., only

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48 credits, necessary to pass, 36

NOTE.—Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it *Ans.*

1. Find the square root of $20 - 5\sqrt{12}$.   4

2. Discuss the roots of the equation $x^2 + ax = b$ as to their being positive or negative, real or imaginary, equal or unequal.   6

3. Derive the formula for the last term of a geometric series and that for the sum of the series. (Simply stating the formulas will not be sufficient.)   6

4. Expand $\left(\dfrac{a^{\frac{1}{2}}}{2} - \dfrac{3}{b} \right)^{-\frac{1}{5}}$ to four terms by the binomial formula. 4

5. Resolve $\dfrac{5x - 11}{2x^2 + x - 6}$ into partial fractions by the method of undetermined coefficients.   4

6. Combine the equation $x = a + b$ and the inequality, $y > a - b$, by adding, subtracting, multiplying and dividing member by member.   4

7. Define logarithm. Name and define the two parts of a logarithm. The logarithm of 65.68 is 1.8174; what is the logarithm of .06568? 4

8. Revert the series $y = x + x^2 + x^3 + \cdots$ to four terms and find the approximate value of x when $y = \dfrac{1}{10}$.   8

9. Find the equal roots of the equation $x^4 - 8x^3 + 23x^2 - 28x + 12 = 0$, then depress the equation and find the remaining roots.   8