

University of the State of New York

Examination Department

134TH EXAMINATION

ALGEBRA

Monday, January 27, 1896 — 9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer 10 questions but no more. If more than 10 questions are answered only the first 10 of these answers will be considered. Division of groups is not allowed. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 10 credits.

1 Define coefficient, exponent, sign of aggregation, surd, pure quadratic equation.

2 Simplify  $\left(\frac{x^2+y^2}{x^2-y^2} - \frac{x-y}{x+y}\right) \frac{x+y}{2xy} + \frac{x^2-1-y^2}{x-y}$

3 Simplify  $2a\{b - [a - (b-a) - b] - a\}$

4 Factor  $x^2-36$ ,  $a^2+4a-21$ ,  $a^2+3ab+2b^2$ ,  $2a-1-2ab+b$ ,  $a^4+a^2b^2+b^4$

5 Solve  $\begin{cases} ax+by=2 \\ x+y = \frac{a+b}{ab} \end{cases}$

6 The sum of two numbers is 4 more than twice the smaller, and one fourth the smaller plus one fifth the greater is 8; find the numbers.

7 Solve  $6x^2+x-1=0$

8 Expand  $(a+\frac{1}{2})^5$  by the binomial formula, and give all the work of finding the coefficients.

9-10 Solve  $\sqrt{6x+6} - \sqrt{3x+1} = \sqrt{5x-21}$

11-12 Solve  $\begin{cases} x^2+y^2=a \\ x+y=b \end{cases}$

13-14 Derive the equations for solving the following: In a number of three places the sum of the digits is 10, the digit in unit's place is double that in hundred's place; if the order of the digits is reversed the number will be increased by 198.

15 Simplify  $\sqrt{20}$ ,  $\sqrt[3]{40}$ ,  $\sqrt{\sqrt[3]{64}}$ ,  $\sqrt[3]{a^4b^3}$ ,  $\sqrt{\frac{a^2b}{c}}$