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University of the State of New York

Examination Department

122d examination

ALGEBRA

Wednesday, June 13, 1894—9 : 15 a. m. to 12 : 15 p. m., only

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100 *credits, necessary to pass,* 75

Answer questions 1-5 and five of the others but **no more.** *Division of groups is* **not allowed.** *If more than five of these questions are answered only the first five of these answers will be considered. 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 *symmetric equations, elimination, transposition, imaginary quantity, surd.*

2 Simplify $\left(\frac{3a+3b}{a+2b}-1\right)\left(\frac{b-a}{2a+b}+1\right)\left(\frac{a^2+b}{a+b^2}\right)$

3 Remove parentheses and simplify

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

4 Factor the following: a^4-16, $2a^2+3ab-2b^2$, x^4+4x^2+16, $2a^2b+ab^2-b^3$

5 Solve $\begin{cases} 2ax+3by=c \\ bx-ay=2b \end{cases}$

6 Solve $\begin{cases} \frac{4}{x}+\frac{3}{y}=1 \\ \frac{1}{x}+\frac{6}{y}=1\frac{1}{8} \end{cases}$

7-8 Solve $x^4-3x^2=4$ (Find 4 roots.)

9-10 Solve $\begin{cases} x^2+xy=36 \\ x^2-y^2=-9 \end{cases}$ (Find two values of each unknown quantity.)

11 Solve $\sqrt{x}+\sqrt{a-x}=\sqrt{a+b}$

12-13 Extract the square root of

$$x^4+\frac{2x^3}{y}+2x^2y^2+\frac{x^2}{y^2}+2xy+y^4$$

14-15 The length of a certain field is twice its width and the number of rods in its perimeter is 16 times the number of acres in its area; find the length and the width of the field.