University of the State of New York

Examination Department

125th examination

ALGEBRA

Wednesday, September 26, 1894—9 : 15 a. m. to 12 : 15 p. m., only

---

100 *credits, necessary to pass,* 75

Answer questions 1-5 and five of the others but **no more.** *If more than five of these questions are answered only the first five 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 *complete quadratic equation, radical quantity, surd, simple equation, root of an equation.*

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

3 Factor the following: $2a^2-5ab+2b^2$, $16x^4+16x^2y^2+16y^4$, x^8-16, $a^2-3ab-a+3b$

4 Indicate the following by signs: the difference of a and b is multiplied by c, this product increased by $2a$, the sum divided by the sum of a and b and this quotient is subtracted from a times the sum of 5 and b.

5 Solve $\frac{a+x}{b}-\frac{a-x}{c}=\frac{b}{c}$

6–7 Solve $2ax+by=2a^2+3ab-b^2$

$bx+ay=a^2+b^2$

8 Solve the following and verify both roots: $6x^2+x=2$

9–10 Solve $\sqrt{x+1}-\sqrt{x-4}=\sqrt{x-7}$

11–12 Solve $x^2+xy=\frac{5}{12}$

$xy+3y^2=\frac{1}{2}$

13 Expand $(2a+b)^5$ by the binomial theorem, giving all necessary computations.

14 Simplify $\sqrt{\frac{3}{5}}$, $3\sqrt{27}$, $(a-b)\sqrt{\frac{a+b}{a-b}}$, $\frac{\sqrt{45}}{\sqrt{80}}$, $\sqrt{a^{\frac{1}{2}}}$

15 Simplify $(a^{\frac{4}{5}}-a^{\frac{3}{5}}b^{\frac{1}{5}}+a^{\frac{2}{5}}b^{\frac{2}{5}}-a^{\frac{1}{5}}b^{\frac{3}{5}}+b^{\frac{4}{5}})(a^{\frac{1}{5}}+b^{\frac{1}{5}})$