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University of the State of New York

Examination Department

124th examination

ALGEBRA

August 1894 — Three hours, only

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100 *credits, necessary to pass,* 75

Answer 10 *questions but* no more. *Division of groups is not allowed. If more than* 10 *questions are answered only the first* 10 *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 *power, root, degree of a term, surd, affected quadratic equation.*

2 Remove parentheses and simplify $a\,[(a+b)\,(2a-3b)-(-a+b)\,(3b+a)-a(1+3b)]$

3–4 Simplify $\frac{3}{x+y}+\frac{1}{x-y}-\frac{x-y}{x^2+y^2}-\frac{x+y}{x^2-y^2}$

5–6 Find the greatest common divisor of $a^3x^2+2a^2x^3+2a^2bx^2+4abx^3$ and $a^2bx+2aby+2ab^2x+4b^2y$

7–8 Solve $\frac{x}{2a}+\frac{y}{3b}=3a+1,\ ax+2by=6\,(a^3+b^2)$

9–10 Solve $x^4+4x^2=32$. Find four roots.

11–12 Solve $x^3-y^3=2b\,(3a^2+b^2),\ x-y=2b$

13 Simplify $\sqrt{50},\ \tfrac{1}{2}\sqrt{\tfrac{1}{2}},\ \sqrt[3]{16\,a^4b^3},\ \sqrt{a}\times\sqrt[3]{b},\ \sqrt{12}+\sqrt{27}$

14 Form an equation whose roots are a and $-\frac{b}{2}$

15 Expand by the binomial formula $\left(\frac{a}{2}-3b\right)^5$, giving all the work of finding the coefficients.