University of the State of New York

38TH ACADEMIC EXAMINATION

ELEMENTARY ALGEBRA

(Through Quadratics)

MONDAY, June 9, 1890—Time, 9:15 A. M. to 12:30 P. M., only

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44 credits, necessary to pass, 33

1. Mention two important points of difference between arithmetic and algebra 2

2. Write in algebraic symbols, x plus the square root of the binomial a square plus x square, equals the fraction, twice a square divided by the square root of the binomial a square minus x square 3

3. From $4y^2 + 4xy + x^2 - 2a(x+y) + 6\sqrt{a^2-x^2} - 8\sqrt[3]{b^2-y^2}$ take $4x^2 + 4xy + y^2 - 4a(x+y) - 10\sqrt[3]{b^2-y^2} + 4\sqrt{a^2-x^2}$.. 3

4. Explain how you obtain the algebraic sign and coefficient of the first two terms of the answer in the last example..... 4

5. Simplify $\left(\frac{x}{x+y}+\frac{y}{x-y}\right) \div \left(\frac{x}{x-y}-\frac{y}{x+y}\right)$ 2

6. Find the greatest common divisor of $x^6 - y^6$ and $ax^3 - bx^3 - ay^3 + by^3$, and express the answer in prime factors 6

7. What number must be subtracted from both numerator and denominator of the fraction $\frac{79}{87}$ in order that the value of the result may be $\frac{3}{4}$? 2

8. Solve $\frac{x+3y}{x-y} = 8 \quad \frac{7x-13}{3y-5} = 4$ 4

9. Expand $(1-2x)^5$. Give the general law of coefficients and its application to obtain the coefficients in this example..... 4

10. Find the cube root of $27x^3 - 135x^2 + 225x - 125$..... 3

11. What is the value of (1) $2\sqrt[3]{14} \times 3\sqrt[3]{4}$..... 2

(2) $\sqrt{a^2-b^2} \div \sqrt{a-b}$..... 2

12. Solve $\begin{aligned} 3xy - 2(x+y) &= 28 \\ 2xy - 3(x+y) &= 2 \end{aligned}$ 4

13. There are two square rooms whose floors contain together 890 square feet, and the side of one floor is 4 feet longer than a side of the other floor. Required the length of a side of each floor..... 3