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

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 $4y^2 + 4xy + x^2 - 2a(x + y) + 6\sqrt{a^2 - x^2 - 8}b^2 - y^2$ take $4x^2 + 4xy + y^2 - 4a(x + y) - 10\sqrt{b^2 - y^2} + 4\sqrt{a^2 - x^2}$. 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 $\frac{7}{9}$ in order that the value of the result may be $\frac{3}{4}$? 2

8. Solve $\frac{x + 3y}{x - y} = 8$ $\frac{7x - 13}{3y - 5} = 4$ ........................................ 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 $3xy - 2(x + y) = 28$ ........................................ 4

   $2xy - 3(x + y) = 2$ ........................................ 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