

University of the State of New York.

37TH ACADEMIC EXAMINATION.

ALGEBRA.

(Through Quadratics.)

MONDAY, March 3, 1890—Time, 9:30 A. M. to 12:30 P. M., only.

48 credits, necessary to pass, 36.

1. Distinguish between an algebraic number and an algebraic expression, and give an example of each..... 4
2. Deduce the rule for treatment of signs in multiplication in algebra 2
3. Simplify $6x - (3x - 2y) - (2x - 3y - 4z) - (x - 7x - 5y)$ 3
4. Collect in parenthesis the coefficients of x in $abcx + ab^2 + cd^2x + acd + abdx + a^2b + c^2dx + bcd$ 2
5. Find the prime factors of each of the following: $x^4 - 81$; $x^4 - (x - 6)^2$ 6
6. What is the difference between an identical equation and an equation of condition? Give an example of the former..... 3
7. Show whether or not the following is a quadratic equation: $x^2 + 7x^3 = 8$ 2
8. Solve the following:
 - a. $(a - x)(b - x) = x^2$ 2
 - b. $\frac{3}{x} + \frac{8}{y} = 3$
 - $\frac{x}{15} - \frac{y}{4} = 4$ 3
9. Divide 40 into two parts such that the sum of the quotients obtained by dividing one part by 7 and the other part by 3 may be equal to 10..... 2
10. There is a number consisting of two digits such that the number is equal to three times the sum of its digits and if it be multiplied by three, the result will be equal to the square of the sum of its digits. (Give statement only.)..... 2
11. Expand $(3m - n^2)^4$ and explain how the coefficients are obtained 3
12. Find the fourth root of $16x^4 - 96x^3y + 216x^2y^2 - 216xy^3 + 81y^4$ 3
13. Form the quadratic equation whose roots are $-\frac{2}{3}$ and $-\frac{1}{3}$ 2
14. Simplify $\sqrt{27ab^2} + \sqrt{75a^3} + (a - 3b)\sqrt{3a}$ 3
15. Solve $x^3 - y^3 = -65$,
 $x^2 + xy + y^2 = 13$ 3
16. A certain company agreed to build a vessel for \$6,300; but, two of their number having died, the rest had each to advance \$200 more than they otherwise would have done. Of how many persons did the company consist at first?..... 3