University of the State of New York.

36TH ACADEMIC EXAMINATION.

HIGHER ALGEBRA.

MONDAY, January 20, 1890—Time, 9:30 A. M. to 12:30 P. M., only.

44 credits, necessary to pass, 33.

1. Find the square root of $28 + 10\sqrt{3}$ 3

2. Multiply $a^{\frac{4}{3}} - 2 + a^{-\frac{4}{3}}$ by $a^{\frac{2}{3}} - a^{-\frac{2}{3}}$ 2

3. Find the quadratic equation whose roots are 7 and -6, and use this equation to illustrate two methods of completing the square 4

4. Solve $\dfrac{\sqrt{a^2 + x^2} - a}{\sqrt{a^2 + x^2} + a} = b$ 2

5. Solve $x^2 + xy = 56$
$xy + 2y = 60$ 4

6. The sum of the cubes of two numbers is to the difference of their cubes as 559 to 127, and the square of the first multiplied by the second is equal to 294. Find the numbers 4

7. The first term of an arithmetical progression is $n^2 - n + 1$, and the common difference is 2; find the sum of n terms 2

8. The product of three numbers in geometrical progression is 64, and the sum of their cubes is 584. Find the numbers 3

9. What is meant by the base of a system of logarithms; the modulus; the mantissa? 3

10. Expand by the binomial theorem $(a^4 + b^{\frac{1}{2}})^{-\frac{7}{2}}$ giving the first six terms 4

11. How many different combinations may be formed from the letters in the name New York, taking three at a time? 3

12. Separate $\dfrac{x^2}{(x^2 - 1)(x - 2)}$ into its partial fractions 2

13. Develop $\dfrac{1 + x}{x - 2x^2 + 6x^3}$ into an infinite series 3

14. Solve $x^4 - 6x^3 + 3x^2 + 26x - 24 = 0$ 5