University of the State of New York.

28th Advanced Academic Examination.

ALGEBRA.

(Through Quadratics)

June, 1887—Time two and one-half hours only.

48 credits, necessary to pass, 36.

1. Define and illustrate by an example each of the following : binomial ; positive term ; exponent ; coefficient ; literal equation 5

2. What name is given to algebraic terms containing the same letters with the same exponents ; to a quantity whose terms are all of the same degree ? 2

3. Multiply $a^4 - a^3 + a^2 - a + 1$ by $a + 1$ 3

4. Resolve the following into prime factors : $2ax^2 + 12ax - 14a$; $a^2 - 13a - 14$; $a^4 - b^4$; $a^5 - a$ 8

5. Divide $\dfrac{ax - x^2}{a + b}$ by $\dfrac{ay + xy}{a + b}$ 2

6. Describe the process of transposition and give a reason for the process 2

7. Solve $3x - 5y = 63$.
   $\frac{1}{2}x + \frac{2}{3}y = -3$ 3

8. Solve $ax + b = cx + d$, and verify the value of x 3

9. If a man have 12 hours for an excursion how far can he ride by train at 32 miles an hour so as to return by carriage at 8 miles an hour, and allow two hours for dinner ? (Give statement only) 2

10. Divide the number 63 into two such parts that one-third of the less will equal one-fourth of the greater (solve by one unknown quantity) 2

11. The sum of three numbers is 21, the sum of the first and third is twice the second, and the sum of the second and third is 5 more than the first. Find the numbers 3

12. Write out the expansion of $(2a + 3b)^2$ 2

13. Extract the square root of $a^2 + 2a - 1 - \dfrac{2}{a} + \dfrac{1}{a^2}$ 3

14. Form the quadratic equation whose roots are 8 and $-\frac{3}{4}$. 2

15. A rectangular field whose length exceeds its width by 34 rods contains 800 square rods. Find its length and width 2

16. Solve $x^2 + y^2 = 61$
    $x^2 - xy = 6$ 4

☞ *Carefully read and obey the following directions :*

☞ Do you now, at the close of this examination, conscientiously declare, that you had no previous knowledge of the questions to be proposed, that you have neither given to any other scholar, nor received from any source, explanations or other aid in answering any of them. If so, write *in the next line after the end of your set of answers*, near the right side of the paper, the words "*I do so declare,*"

and underneath *subscribe your name* ⸺

☞ Every set of papers lacking this *full declaration* and *signature*, however satisfactory in other respects, will be rejected, on the presumption that the required declaration could not conscientiously be made.

☞ Fold your MS. in proper form for filing, and indorse the last leaf with the name of your institution, your own name, the subject and the date of the examination.