

University of the State of New York

## Examinations Department

80th examination

### ALGEBRA

Wednesday, March 16, 1892—9:15 a. m. to 12:15 p. m., only

48 credits, necessary to pass, 36

NOTE.—Give all operations (except mental ones) necessary to find the results. Reduce each result to its simplest form and mark it *Ans.*

1. Define and illustrate each of the following: numerical equation, binomial, surd. 6

2. Find the value of the following expression when  $x = 4$  and  $y = 5$ :

$$x^2 - 3(x - y) + (x - 2y). \quad 3$$

3. Simplify  $\frac{\frac{1}{a} + \frac{1}{b}}{\frac{1}{a} + \frac{1}{b}} + \frac{\frac{1}{a} - \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}}$ . 4

4. Solve  $x + 2y + z = 12$   
 $2x - y + z = 5$   
 $3x + y - 2z = 1.$  6

5. Solve  $2x^2 - 3x = 9.$  4

6. The sum of the ages of A and B is 48 years, and A is  $\frac{3}{5}$  as old as B. Find the age of each. 4

7. The sum of the squares of two numbers is 41, and if the sum of the two numbers be multiplied by the greater the product is 45. What are the numbers? (Find four values for each unknown quantity.) 4

8. Find the factors of  $x^2 - 4y^2$ ,  $x^3 - y^3$ ,  $x^2 + x - 6$ ,  $2x^2 - 4x - 16.$  4

9. Solve  $\sqrt{a+x} + \sqrt{a-x} = 2\sqrt{x}.$  4

10. Find the square root of  $a^2 + 4ab - \frac{2a}{c} + 4b^2 - \frac{4b}{c} + \frac{1}{c^2}.$  3

11. Simplify  $\frac{2\sqrt{12} + \sqrt{27} - \sqrt{48}}{\sqrt{\frac{1}{3}}}.$  3

12. Expand by the binomial formula  $(a - 2b^2)^5.$  3