

University of the State of New York

Examinations Department

81st examination

ALGEBRA

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

60 credits, necessary to pass, 45

NOTE—Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it *Ans.*

1. Define and illustrate each of the following: (a) coefficient; (b) term; (c) homogeneous polynomial; (d) literal equation. 8

2. Indicate the following in algebraic language forming one connected expression: 4 times a increased by $2b$ times the sum of a and c ; this result diminished by $4a$ times the product of $a + b$ by $a - b$, and this remainder multiplied by $3c$. 5

3. Find the value of $x^n + x^{n-2} + x^{n-3}y^2$ when $x = 2$, $y = 4$, $n = 2$. 4

4. Find the prime factors of $a^2 + a - 12$, $b^2 + 3b + 2$, $3x^2 - 15x + 18$. 7

5. Simplify $\frac{4a-2b}{a+b} - \frac{3a-2b}{a-b} + \frac{a}{a^2-b^2}$ 4

6. Solve (a) $\frac{x-b}{2a} - \frac{x-a}{2b} = 1$. 3

$$(b) \quad 2x + 3y - 4z = -4$$

$$x + 2y + z = 8$$

$$2y + z - x = 6.$$

4

7. Expand $\left(a - \frac{b}{2}\right)^5$ by the binomial formula. (Write in full the work of finding coefficients.) 4

8. Solve $3x - \frac{x-1}{x+1} = \frac{17}{2}$, obtaining both values of x . 4

9. The sum of two numbers is 5, and the sum of their squares is 13; find the numbers. 4

10. Simplify $(\sqrt{27} - \sqrt{12})(\sqrt{8} + \sqrt{18})$. 5

11. If a times the larger of two numbers plus b times the smaller is c , and b times the larger plus a times the smaller is d , what are the numbers? 5

12. Form the equation whose roots are $-2a$ and $+b$. 3