

22

University of the State of New York
Examination Department

128th examination

ALGEBRA

Wednesday, March 13, 1895—9:15 a. m. to 12:15 p. m., only

100 credits, necessary to pass, 75

Answer questions 1-5 and five of the others but no more. If more than five of these other questions are answered only the first five of these answers will be considered. Division of groups is not allowed. Give each step of solution. Reduce fractions to lowest terms. Express final result in its simplest form and mark it Ans. Each complete answer will receive 10 credits.

1 Define substitution, transposition, radical, surd, degree of a term.

2 Simplify $2ab - \{b(2a-c) - bc\} + 3a[6bc - 2b\{c - 3(a-c)\}]$

3 Solve $\frac{(b+c)x}{a} + \frac{(b+c)y}{b} = 2$

$$(b+c)x + (b+c)y = a+b$$

4 Solve $x^2 + \frac{2x}{3} = 23\frac{1}{4}$

5 Simplify $\sqrt{12}$, $\sqrt{\frac{1}{ab}}$, $3\sqrt{\frac{1}{3}}$, $\frac{\sqrt{18}}{\sqrt{54}}$, $\sqrt{30} \times \sqrt{40}$

6 Find the factors of $6a^2 + 5ab - 4b^2$
 $x^4 + xy^3 + x^3y + y^4$
 $x^8 - 1$
 $9x^4 - 12x^3 + 4x^2$
 $x^4 + x^2y^2 + y^4$

7-8 Solve $x^2 + 3xy = 22$
 $xy + 4y^2 = 42$

9 Solve $abx + b\sqrt{x} = c$

10 Expand by the binomial formula $(2a^{\frac{1}{2}} + b)^5$, giving all the work for finding the coefficients.

11 A man loaned a certain sum of money at m per cent simple interest and twice as much at n per cent, the interest on both loans amounting to d dollars a year; what was the whole amount loaned?

12-13 It took a man 12 hours to make a certain journey. Had he traveled 1 mile an hour faster he would have required 2 hours less time; what was his rate an hour and how long was the journey?

14-15 A merchant expends \$100 in the purchase of two kinds of silk goods, buying one kind at \$4.50 a yard and the other at \$4 a yard. If he sells it all at \$4.25 a yard he will gain 2 per cent; how many yards of each kind did he purchase?