University of the State of New York

75TH EXAMINATION

ALGEBRA

MONDAY, Jan. 19, 1891—9:15 A. M. to 12:15 P. M., only

48 *credits, necessary to pass,* 36

1. Define and give an example of (*a*) similar terms; (*b*) a radical quantity; (*c*) a surd; (*d*) an equation; (*e*) an exponent; (*f*) similar radicals. 6

2. Explain what you understand by the algebraic difference between two numbers. 1

3. Simplify (*a*) $2m-[3m-(5m-2)-\{m-(2m-\overline{3m+4})\}]$ 3

(*b*) $\frac{m}{mn-n^2}-\frac{1}{m-n}-\frac{1}{n}$ 2

4. Solve (*a*) $\frac{3x+1}{3}=\frac{4x+5}{4}-\frac{8+x}{6}+\frac{2x+5}{8}$ 2

(*b*) $\begin{aligned} x+y&=2 \\ x+z&=3 \\ y+z&=-1 \end{aligned}$ 2

5. Factor $1000-27a^3b^6$; x^3+8x^2+7x; $x^2+2xy+y^2-4$. 6

6. A boatman rows down stream 20 miles and back again in 10 hours. He finds that he can row 2 miles against the stream in the same time that he can row 3 miles with it. Required the time each way. 3

7. What number is that, the treble of which, increased by 12, shall as much exceed 54 as that treble is less than 144? 2

8. Expand $(a^m-a^n)^4$. 3

9. Solve $\begin{aligned} x^2-xy+y^2-3&=0 \\ x^2-2xy+4y^2-4&=0. \end{aligned}$ 4

10. Find the cube root of $9x^3-21x^2-36x^5+8x^6-9x+42x^4-1$. 4

11. Simplify (*a*) $3\sqrt{242x^5y^5}+11xy\sqrt{2x^3y^3}$; (*b*) $\sqrt[3]{40}-\sqrt[3]{135}$. 4

12. Two floors, each square in form and one 7 feet wider than the other, contain together 1429 square feet. How many square feet in each? 3

13. Multiply $a^3b-a^2b^2-4ab^3$ by $2a^2b-ab^2$ and divide the product by a^2-4b^2-ab. 3