University of the State of New York

199TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, September 13, 1909 — 9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting at least two from each group. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to less than 75 credits will not be accepted.

Group I 1 Factor $6a^2+7ab-20b^2$, c^4-16d^4, $x^3y^3+2x^2y^2+xy$, $1+r^2+r^4$, $8x^6+y^3$

2 What is the value of $a\{a-b[a^2-2c(b^3-\overline{a-b}\div c)+b]-c\}$ when $a=3$, $b=1$, $c=2$?

3 Solve $1-\dfrac{a}{a+x+\dfrac{x^2}{a-x}}=\dfrac{b}{a}$

4 Two numbers are to each other as 2 to 3, but if 50 is subtracted from each number they will be to each other as 1 to 2. What are the numbers?

Group II 5 Rationalize the denominator of $\dfrac{2\sqrt{3}+3\sqrt{2}}{5+2\sqrt{6}}$ and reduce the result to its simplest form.

6 Solve $\sqrt{2x-7}+\sqrt{2x+9}=8$

7 Develop $(3a-2b)^7$ by the binomial formula, giving all the work.

8 The sum of two numbers is 6 and the sum of their squares is to the square of their sum as 5 to 9; what are the numbers?

Group III 9 Solve $\begin{cases} x^3-y^3=279 \\ x-y=3 \end{cases}$

10 A mirror 14 in. by 15 in. has a frame of uniform width; the area of the frame equals that of the mirror. What is the width of the frame?

11 A loaned to B a certain sum at $4\frac{1}{2}\%$ and to C a sum $200 greater at 5%; from the two together he received $276 interest a year. How much did he lend each?

12 A man cut, for $35.60, two piles of wood whose united contents were 26 cords; the labor on each pile cost as many dimes per cord as there were cords in the pile. Find the number of cords in each pile.