University of the State of New York

199TH HIGH SCHOOL EXAMINATION

INTERMEDIATE 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. Write the answers in the order of the questions. No credit will be allowed unless all operations (except mental ones) are given. 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 Find the prime factors of *each* of the following: $2a^2-5ab+3ac+2b^2-6bc$; a^4+64b^4; $a^{10}+b^{10}$; $(x-m)^3-8$; $6x^4+2x^2y^2-8y^4$

2 Solve $\dfrac{\frac{x-1}{a}}{\frac{a+1}{x}}=\dfrac{\frac{x}{a-1}}{\frac{a}{a+x}}$

3 Find the square root of $1+4x$ correct to *four* places.

4 A boy bought some apples at the rate of 3 for a cent; he sold $\frac{1}{3}$ of them at the rate of 2 for a cent, $\frac{1}{5}$ at the rate of 3 for 2 cents and the remainder at the rate of 7 for 5 cents; he gained 18 cents. How many apples did he buy?

Group II

5 Simplify $\dfrac{2^{-3}\times3^{-2}\times4^{-\frac{3}{2}}}{9^{-1}\times8^{-\frac{5}{3}}}$; $a^{-\frac{1}{3}}\times2a^{\frac{1}{3}}$; $\dfrac{x^{\frac{1}{2}}\sqrt[6]{x^{-7}}}{x^{-\frac{1}{3}}\sqrt[4]{x^{-5}}}$

6 Simplify $(-3\sqrt{-3})(5\sqrt{-3})$; $\dfrac{-\sqrt{12}}{\sqrt{-6}}$; $(\sqrt{-1})^3$; $(\sqrt{-1})^5$

7 Find the ratio of x to y in the following equation:

$$\frac{4x-3y}{4y-3x}=\frac{3x-2y}{4x}$$

8 Insert 3 geometric means between a and l.

Group III

9 Solve $\begin{aligned} x\ &+\sqrt{xy}+y\ =14 \\ x^2&+\ xy+y^2=84 \end{aligned}$

10 Plot the graph of $x^2-3x-5=0$ and from the graph find the approximate values of the roots of the equation.

11 Solve $x^{-3}+\dfrac{16}{x^{-3}}=10$

12 The square on the length of a certain rectangle exceeds the square on the width by twice the area of the rectangle diminished by 63 square feet; if the length of the rectangle were decreased by 3 feet and the width increased by 3 feet the area would be increased by 36 square feet. Find the dimensions of the rectangle.