*New York State Education Department*

208TH HIGH SCHOOL EXAMINATION

# INTERMEDIATE ALGEBRA

**Monday, January 20, 1913—9.15 a. m. to 12.15 p. m., only**

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Write at top of first page of answer paper (*a*) name of school where you have studied, (*b*) number of weeks and recitations a week in algebra. The minimum time requirement is two recitations a week for a school year or four recitations a week for half a school year, after the completion of elementary algebra.

*Answer eight questions, including the questions in group I and two questions in each of the other groups. Credit will not be granted unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient. Each answer should be reduced to its simplest form.*

## Group I

1 Simplify $\left(x^2-y^2+\frac{4xy(y+x)}{x-y}\right)\div\left(\frac{x^2+y(y+2x)}{4x^2-6xy+2y^2}\right)$

[Credit will not be granted for the answer to this question if there is any error in the work.]

2 Solve $x^{-4}-4x^{-2}-21=0$

## Group II

3 Find *two* numbers in the ratio of 3:2 such that their sum shall be to the difference of their squares as 1:5.

4 Write, with integral coefficients, the quadratic equation whose roots are $\frac{1}{2}(3+\sqrt{-7})$ and $\frac{1}{2}(3-\sqrt{-7})$

5 Find the sum of the series 4, $-\frac{8}{3}$, $\frac{16}{9}$ . . . to infinity.

## Group III

6 Solve $x^2+px+q=0$ and state the relation between the roots and the coefficients.

7 Solve $3\sqrt{x+8}-\sqrt{x-8}=2\sqrt{2x+2}$

8 The sum of the cubes of two numbers is 756; the sum of the squares of these numbers diminished by their product is equal to 63. Find the numbers.

## Group IV

9 A merchant bought some pieces of silk for $900; had he bought 3 pieces more for the same money, he would have paid $15 less for each piece. Find the number of pieces purchased.

10 Solve graphically the following, estimating the roots to the nearest tenth:

$$\begin{cases} y=8-x^2 \\ 2x-6y=-9 \end{cases}$$

11 Divide $\frac{1}{x^{-\frac{1}{2}}}-\frac{1}{y^{-\frac{1}{2}}}$ by $\sqrt[3]{x}-\sqrt[3]{y}$

[Credit will not be granted for the answer to this question if there is any error in the work.]