200TH HIGH SCHOOL EXAMINATION

ADVANCED ALGEBRA

Monday, January 17, 1910—9.15 a.m. to 12.15 p. m., only

Write at the top of the first page of your answer paper (a) the name of the school where you have studied, (b) the number of weeks and recita-

tions a week that you have had in algebra.

Five recitations a week in algebra for two school years, in a recognized academic school, is the regular requirement, and any statement showing less or other than this should be accompanied by a satisfactory claim or explanation made by the candidate and certified by the principal; otherwise such paper will be returned.

Answer eight questions. No credit will be allowed unless all operations (except mental ones) necessary to find results are given.

- r Divide $x^3 + 3x^2 + x + 3$ by $x + \sqrt{-1}$. Prove your work.
- ² Reduce $J_{17}^{5.9}$ to an equivalent continued fraction and find the first four convergents.
- 3 How many numbers, of five different figures each, can be formed from the digits 2, 3, 4, 5, 8? How many of these numbers will be even?
- 4 Find the sum of the series $1+5x+21x^2+85x^3+341x^4...$ of the second order. Prove.
- 5 Locate graphically the roots of the following equation: $x^3 - 5x^2 + 3x + 7 = 0$
- 6 Transform $x^4 + 2x^3 + x^2 7x + 31 = 0$ into an equation whose roots shall each be one less than the roots of the given equation.
 - 7 Given $\log 2 = .3010$, $\log 7 = .8451$; solve $7^{3x+3} = .8^x$
- 8 Prove that the sum of the first n terms of the series 1, 3, $5 \dots is n^2$.
 - 9 Find the successive derivatives of $3x^4+2x^3+5x^2+6x+4$
- 10 State and prove the relation between the roots of an equation and the coefficients of its terms.
 - 11 Find the value of $\begin{vmatrix} 2 & 3 & 1 \\ 4 & -2 & 5 \\ 1 & 2 & -2 \end{vmatrix}$
- 12 Represent graphically cach of the following and their sum: $2-4\sqrt{-1}$, $-5-3\sqrt{-1}$