194TH HIGH SCHOOL EXAMINATION

ADVANCED ALGEBRA

Monday, January 27, 1908—9.15 a. m. to 12.15 p. m., only

Answer eight questions. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans.

1 Divide $x^4 - 12x^3 + 53x + 21$ by $x - 3$ to *four* terms and find the remainder, using the synthetic method.

2 In how many ways can a selection of 5 books be made from 14 books, when one specified book is always included?

3 Revert to *four* terms the series, $y = 2x + x^2 - 2x^3 - 3x^4 + \ldots$

4 By the method of undetermined coefficients expand to *four* terms $\frac{2 - 3x^2 - x^3}{1 - 2x + 3x^2}$ in ascending powers of x.

5 By Horner's method of approximation find to *three* places of decimals the cube root of 10.

6 By the method of determinants solve $\begin{cases} 2x + 4y - z = 7 \\ 4x - 3y + 2z = 4 \\ x + y - z = 0 \end{cases}$

7 Form the equation of the fourth degree with rational coefficients, three of whose roots are $+3$, -3, $+\sqrt{-13}$

8 Plot the graph of the equation $y^2 = 4x + 4$

9 Given $3^x = 2$; find the value of x in terms of log 2 and log 3.

10 Find the multiple roots of the equation

$$x^5 - 3x^4 - 2x^3 + 6x^2 + x - 3 = 0$$

11 Find three numbers in geometric progression such that their sum shall be 104 and the last shall exceed the first by 64.

12 Transform the equation $x^4 - 7x^2 + 6x = 0$ into an equation each of whose roots is less by 4 than the roots of the given equation.