198TH HIGH SCHOOL EXAMINATION

INTERMEDIATE ALGEBRA

Monday, June 14, 1909—9.15 a. m. to 12.15 p. m., only

Answer seven questions, selecting three from group I and two from each of the other two groups. Each complete answer will receive 14⅔ credits. No credit will be allowed unless all operations (except mental ones) necessary to find results are given.

Group I 1 Solve $\frac{ax+b}{cx+d}=1$. Determine the value of x when $a=c$, when $b=d$, when $a=c$ and $b=d$

2 *a* Simplify $\frac{3+2\sqrt{-1}}{3-2\sqrt{-1}}$; $(2+3\sqrt{-1})(3-4\sqrt{-1})$

b Find the value of $x^2-6x+14$ if $x=3+\sqrt{-5}$

3 *a* Find the square root of $8+\sqrt{60}$

b Without extracting the roots determine which is the greater $\sqrt{7}$ or $\sqrt[3]{18}$

4 Free the following equation from radicals and find the value of x when $q=0$: $x=-\frac{1}{2}q+\sqrt{-\frac{1}{4}q^2+\sqrt{q^4+r^4}}$

Group II 5 The hypotenuse of a right triangle is 20; the sum of the other two sides is 28. Find the lengths of the sides.

6 In a geometric progression the sum of the first and second terms is 12; the sum of the third and fourth terms is 108. Find (*a*) the ratio, (*b*) the sum of the first seven terms.

7 The sum of all the even integers from 2 to a certain number inclusive is 702; find the last of these integers.

Group III 8 Plot the graphs of the following system of equations:

$$x^2+y^2=4$$
$$3x-2y=6$$

From the graphs find the approximate values of x and y that satisfy both equations.

9 Find the roots of the equation $ax^2+bx+c=0$ and discuss their values when c and a are both positive.

10 Solve as a quadratic $\left(x-\frac{1}{x}\right)^2+\frac{5}{6}\left(x-\frac{1}{x}\right)=1$