1908TH HIGH SCHOOL EXAMINATION

INTERMEDIATE ALGEBRA

Monday, September 14, 1908—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting at least two from each group. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans. Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted.

Group I 1 Given the equation $x^2+px=q$, write the formulas for the roots of this equation and discuss their values when p is negative.

2 Derive the formulas for the last term and the sum of the terms of a geometric progression, first term and ratio being given.

3 Prove that the differences of the squares of any four consecutive numbers form an arithmetic progression. What is the common difference in this progression? [Illustration alone will not be accepted as proof.]

4 Prove $\begin{cases} a^m \times a^n = a^{m+n} \\ a^0 = 1 \end{cases}$

Group II 5 Solve $\begin{cases} x^2-xy+y^2=21 \\ y^2-2xy=-15 \end{cases}$

6 Simplify *each* of the following: $7\sqrt{-8}-3\sqrt{-98}-5\sqrt{-18}$; $\frac{2-\sqrt{-3}}{3+\sqrt{-3}}$; $(2\sqrt{-14})\times(-3\sqrt{-21})$

7 The sum of two fractions is equal to their product and the difference of their squares is $\frac{4}{9}$ of their product; find the fractions.

8 If $a:b=c:d$ prove that $a^2:b^2=a^2+c^2:b^2+d^2$

Group III 9 Determine graphically the values of x and y in

$$x+5y=35$$
$$2x-y=4$$

Prove by algebraic solution the correctness of the result.

10 Solve $12x^{-2}+x^{-1}=35$

11 Write the formula for the r^{th} term of $(x+y)^n$ and apply this formula to finding the 5^{th} term of $(a^4-a^{\frac{1}{2}})^9$

12 A number of boys bought a boat, each paying as many dollars as there were boys in the party; had there been 5 boys more and had each paid $\frac{1}{2}$ as much as he did pay, there would have lacked $10 of the price of the boat. How many boys were there?