197TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 25, 1909—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting at least two from each group.

Group I 1 Reduce the following fraction to lowest terms:

$$\frac{x^3-3x+2}{x^3+x^2-3x-2}$$

2 *a* Express algebraically: 5 times the cube of a is divided by the fraction whose numerator is 6 times the square of b and whose denominator is the square of the difference between x and twice the cube of y.

b Express in words $\frac{5(a^3+b^3)}{(x+2y^4)^3}$

3 Factor *four* of the following: $x^{2n}+2x^ny^n+y^{2n}$; x^6-y^6; $2x^6-10x^4-28x^2$; $ax+ay+bx+by$; $10x^2+13x-3$

4 Find *two* consecutive numbers such that one seventh of the greater exceeds one ninth of the less by one.

Group II 5 Divide $1-x^2$ by x^2-1; then substitute the quotient thus found for x in the following expression and reduce to the simplest form:

$$(2-x-x^2-x^3+x^5)-(1+x-x^2+x^3-x^4)$$

6 By reducing the surds to the same order, determine which is the greater, $\sqrt{3}$ or $\sqrt[3]{5}$.

7 If $a=0.8$, $b=20$, $c=5$ find the numeric value of $\frac{\sqrt{a}+\sqrt{b}}{\sqrt{c}}$ [First rationalize the denominator.]

8 Prove that if four quantities are in proportion the product of the extremes is equal to the product of the means. [A numeric illustration will not be accepted as proof.]

Group III 9 Solve $\begin{cases} x^2+y^2=25 \\ x+y=1 \end{cases}$

10 A carpenter agrees to build a fence for $48; the owner, however, decides to shorten the length of the fence 2 rods and to pay $2 more per rod, the fence thus costing $60. Find the number of rods of fence and the cost per rod.

11 The length of a rectangular lot is 4 rods greater than its width, and its area is 60 square rods; find the dimensions of the lot.

12 The product of the square roots of two consecutive positive numbers is $2\sqrt{14}$; find the numbers.