192D HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, June 17, 1907—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.

Group I 1 Define *five* of the following: coefficient, radical, exponent, elimination, homogeneous equation, quadratic equation, term.

2 Factor *four* of the following: a^2-1+b^2+2ab; $8-x^3$; $35x^2y^2-27b^2z^2+21b^2y^2-45x^2z^2$; a^6+b^6; x^4+13x^2-68

3 Factor each numerator and denominator in the following expression; perform the operations indicated and reduce the result to its lowest terms:

$$\frac{x^2+4x+3}{x^2-8x+7}\times\frac{x^2-2x-35}{x^2-7x-8}\div\frac{x^2+8x+15}{x^2-9x+8}$$

4 The numerator of a fraction is 7 less than the denominator; if 4 is subtracted from the numerator and 1 added to the denominator, the resulting fraction equals $\frac{1}{3}$. Find the fraction.

Group II 5 Reduce to similar surds $7\sqrt[3]{72}$, $16\sqrt[3]{1125}$, $17\sqrt[3]{576}$, $12\sqrt[3]{3087}$. Simplify $\sqrt[3]{2}\times\sqrt[3]{3}$

6 Rationalize the denominator of $\frac{x+y}{\sqrt{x-y}}$; $\frac{\sqrt{a}+\sqrt{b}}{\sqrt{a}-\sqrt{b}}$

7 Extract the square root of $x^6-2x^5-x^4+3x^3+2x+1$

8 Expand by the binomial formula $\left(2a-\frac{b}{3}\right)^5$

Group III 9 Solve $\sqrt{3x+3}-\sqrt{x+2}=\sqrt{x-1}$

10 The perimeter of a rectangle is 52 inches; the square of its length added to the square of its width is 356 inches. Find the area of the rectangle.

11 Solve $\frac{24}{x}-\frac{24}{x+1}=2$

12 Solve $\begin{cases} x^2+y^2+x+y=6 \\ xy=-2 \end{cases}$