188TH HIGH SCHOOL EXAMINATION

ALGEBRA

Monday, January 22, 1906—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but no more. *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.*

1 Simplify $\dfrac{\frac{a}{b}-\frac{b}{a}}{\frac{a}{b}+\frac{b}{a}-1}-\dfrac{1+\frac{b^2}{a^2}-\frac{b}{a}}{\frac{a}{b}+\frac{b^2}{a^2}}$

2 Factor *five* of the following: $3a^2+6ab-24b^2$, $a^{2m}-2a^m-3$, $a^2-2ab-ac+2bc$, x^7+1, $m^4-11m^2n^2+n^4$, x^4-y^4, x^2+y^2

3 Solve $x+\frac{a^2}{x}=\frac{a^2}{b}+b$

4 Solve $\begin{cases} x^2-y^2=144 \\ x\ -y\ =8 \end{cases}$

5 Expand to *four* terms by the binomial theorem $(ax^2-2y)^7$, giving all the work for finding the coefficients.

6 Find three consecutive numbers whose sum is 9 greater than twice the largest number.

7 Solve $\begin{cases} 2x+\ y-2z=17 \\ 3x+5y-4z=40 \\ x-3y+3z=3 \end{cases}$

8 Solve $x+\sqrt{x^2-8}=\dfrac{3x-\sqrt{x^2-8}}{x-\sqrt{x^2-8}}$

9 The square of the sum of two numbers minus the product of the numbers is 441; the difference of the numbers is 6. Find the numbers.

10 Simplify $\sqrt[4]{81}+2\sqrt[4]{\frac{1}{16}}-\sqrt[3]{192}+2\sqrt{125}$; $\dfrac{(\sqrt{5}-2)(3+\sqrt{5})}{5-\sqrt{5}}$; $\sqrt[6]{\frac{a^2}{b^2}}+\sqrt[3]{\frac{a^3}{b^3}}$

11 If 2 is added to the numerator of a certain fraction, the sum of the given fraction and the fraction thus formed is $1\frac{1}{2}$; if 2 is subtracted from the numerator of the fraction, the sum of the fractions is 1. Find the fraction.

12 Define term, coefficient, literal equation, simultaneous equations, affected quadratic.