184TH HIGH SCHOOL EXAMINATION

ALGEBRA

Monday, January 23, 1905—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others but no more. *If more than four of the others are answered only the first four answers will be considered. 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 $\frac{x+y}{(y-z)(z-x)}-\frac{y+z}{(x-z)(x-y)}+\frac{z+x}{(x-y)(y-z)}$

2 Factor *five* of the following: a^8-b^8, $a^{2c}-b^{2d}$, x^6+y^6, $4a^2+11a-20$, $27+m^6$, $ab-3a-2b+6$, $x^4-3x^2y^2+y^4$

3 Solve $\frac{x^2}{3b}=\frac{5x}{4}+\frac{b}{3}$

4 Find the number such that if 16 be subtracted from it, $\frac{1}{7}$ of the remainder will be equal to $\frac{1}{9}$ of the number.

5 Expand $(a^2-\frac{2}{3})^9$ to *four* terms by the binomial theorem, giving all the work for finding the coefficients.

6 Solve $\begin{cases} \frac{x}{2}-\frac{y}{3}+\frac{z}{4}=\frac{2}{3} \\ x-y+z=\frac{1}{2} \\ x+2y+\frac{z}{2}=0 \end{cases}$

7 Find the highest common factor (greatest common divisor) of $a^5-5a^3b^2+8a^2b^3-6ab^4+2b^5$ and $a^4-2a^3b+2a^2b^2-2ab^3+b^4$

8 Solve $\begin{cases} x^3+y^3=61 \\ x^2-xy+y^2=61 \end{cases}$

9 The quotient obtained by dividing one of two numbers by the other is .75; the product of the numbers is 300. Find the numbers.

10 Solve $\sqrt{x+2}+\sqrt{x-3}=\sqrt{4x-3}$

11 Simplify $2\sqrt{12}-3\sqrt{\frac{1}{27}}-\sqrt{300}+3\sqrt{27}$; $(60+\sqrt{30a}-36a)\div(4\sqrt{5}+3\sqrt{6a})$. Prove that $\sqrt[3]{3}$ is greater than $\sqrt[5]{6}$

12 A rectangle and a square are equivalent; the length of the rectangle is 3 feet longer and its width 2 feet shorter than a side of the square. Find the dimensions of each figure.