High School Department

180TH EXAMINATION

ALGEBRA

Monday, January 25, 1904—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 A ns.
Each complete answer will receive 12½ credits. Papers entitled to 75 or
more credits will be accepted.*

1 Define term, polynomial, elimination, surd, affected quadratic.

2 Factor *five* of the following: $a^{2b+1}-a$, $27+y^3$, a^4-3a^2+1, $6b^2-7bx-20x^2$, a^2b-b+a^2c-c, a^2-x^2+2x-1, $32a^6+c$

3 Solve $\dfrac{7m^2}{12}-mx=\dfrac{x^2}{3}$

4 Solve $\begin{cases} x^2-y^2=112 \\ x+y=14 \end{cases}$

5 Simplify
$$a^2-[-2b^2+b(7b-3a)-\{-\overline{3ab+a^2}-b(a-\overline{2a+2b})\}]+3b^2$$

6 Two men can do a piece of work in a days; one man does ¾ as much as the other. How long will it take each man to do the work alone?

7 Find the cube root of
$$m^6-6m^5+6m^4+16m^3-12m^2-24m-8$$

8 Solve $2a=\sqrt{2ax+5a^2}-\sqrt{2ax-3a^2}$

9 Expand $(2x-3)^n$ to *five* terms by the binomial theorem, giving all the work for finding the coefficients.

10 A man rows down stream a distance of 15 miles and back again in 6 hours; he can row 5 miles with the stream in the same time as 3 against the stream. Find the man's rate of rowing in still water.

11 Simplify
$$\frac{7-\sqrt{5}}{3-\sqrt{5}}; \quad (\sqrt[3]{x^2}-2\sqrt[3]{x}-1)(\sqrt[3]{x}-1); \quad \frac{a^{\frac{3}{2}}}{\sqrt{b^{-3}}}-\frac{3\sqrt{ab^{-1}}}{a^{-1}b^{-2}}+\frac{\sqrt{a^2b}}{b^{-1}}$$

12 Two cubic bins together contain 855 cubic feet; the sum of an edge of the larger bin and an edge of the smaller bin is 15 feet. Find an edge of each bin.