

189TH HIGH SCHOOL EXAMINATION

INTERMEDIATE ALGEBRA

Monday, June 11, 1906—9.15 a. m. to 12.15 p. m., only

Answer the first four questions and four of the others. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it *Aus.* Each complete answer will receive 12½ credits. Papers entitled to 75 or more credits will be accepted if written by students in class A; those entitled to 60 or more credits will be accepted if written by students in class B.

1 Simplify $2\sqrt{-5} \times \sqrt{-10} \times \sqrt{-15}$; $3\sqrt{-75} - \sqrt{-48} - 2\sqrt{-27}$;
 $\sqrt{-198} \div \sqrt{-11}$

2 Prove that a factor may be transferred from the denominator of a fraction to the numerator or from the numerator to the denominator, if the sign of its exponent is changed.

3 Extract the cube root of $\frac{a^6}{8} + \frac{3}{4}a^3 - 5a^3 + 12a - 8$

4 Form the quadratic equation with rational coefficients one of whose roots is $a - \sqrt{b}$

5 If \$820 is put at interest for a certain number of years at a certain rate it amounts to \$955.30; if the time were 1 year less and the rate $\frac{1}{2}\%$ more, the amount would be \$918.40. Find the time and the rate.

Or

A merchant bought a number of yards of cloth for \$96; by selling at an advance of \$1.50 a yard, he sold 20 yards for \$14 more than the whole number of yards cost him. How many yards did he buy?

6 Prove that in an arithmetic series $s = \frac{n}{2}(a+l)$; in a geometric series $s = \frac{a(1-r^n)}{1-r}$

7 Factor $a^2 - a + 2ab + 2ac + 2bc - b + b^2$, $4x^4 - 21x^2y^2 + 9y^4$,
 $a^4 - 4a^2 - a^2 + 16a - 12$, $x^{3m} - x^{2m} + x^{m+1} - x^{m+1}$

8 Solve $\begin{cases} 3x^2 - 4xy + 2y^2 = 41 \\ y^2 - x^2 = 40 \end{cases}$

9 Find by the binomial formula the r th term of the expansion of $(a+b)^n$

10 Determine graphically the roots of $\begin{cases} 4x + 5y = 24 \\ 3x - 2y = -5 \end{cases}$

Give the construction in full.