

191ST HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 21, 1907 — 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 Ans. Each complete answer will receive $12\frac{1}{2}$ 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

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

2 Factor each of the following: $6x^2 - 11ax - 2a^2$, $32 + c^4$, $a^9 - 27$, $a^4 - 2a^2 + 1$, $a^{2m} - 2a^mb + b^2$, $a^4 - 6a^2 + 1$

3 Solve $10x^2 + ax = 3a^2$

4 Solve $\begin{cases} x^2 + xy + y^2 = 49 \\ x - y = 2 \end{cases}$

5 If the base of a certain square is increased 15 feet and its altitude is decreased 2 feet, the area of the resulting rectangle will be twice the area of the square. Find the side of the square.

6 Write the first four terms of the expansion of $(a-3b)^9$ by the binomial formula, giving all the work for obtaining the coefficients.

7 Solve $\begin{cases} \frac{5}{x} + \frac{3}{y} = 1\frac{1}{2} \\ \frac{3}{x} - \frac{2}{y} = \frac{4}{15} \end{cases}$

8 Simplify $\sqrt[3]{4^2} \times \sqrt[3]{8} \times 3\sqrt[3]{4}$; $(a - \sqrt{b})(\sqrt{a} - b)$; $\frac{\sqrt{3}+1}{\sqrt{3}-1}$

9 Find the highest common factor (greatest common divisor) of $3x^2 + 6x - 9$, $6x^2 - 21x + 15$, $6x^3 - 6$

10 Find the base and the altitude of a rectangle whose perimeter is 38 feet and whose area is 48 square feet.

11 Find to four terms the square root of $x^2 - 3x + 1$

12 Solve $2\sqrt{x} - \sqrt{x-3} = \sqrt{5+x}$