

194TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 27, 1908—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting at least two from each group. Give all operations (except mental ones) necessary to find results. Reduce each result to its simplest form and mark it Ans.

Group I 1 Define five of the following: power, root, like terms, transposition, simultaneous equations, surd, ratio.

2 Factor four of the following: $1-6a-49b^2+9a^2$; x^3-y^3 ; $(x-y)^2-2(x-y)(y-z)+(y-z)^2$; x^2+64 ; $mx-am-nx+an$

3 Reduce to simplest form:

$$\frac{x^2+4x+3}{x^2+3x-10} \times \frac{2x^2-x-6}{3x^2+16x+21} \times \frac{3x^2+22x+35}{5x^2+4x-1} \div \frac{6x^2+27x+27}{15x^2+42x-9}$$

4 The sum of $\frac{1}{3}$ of a number, $\frac{2}{3}$ of it and $\frac{1}{3}$ of it is $5\frac{1}{3}$ more than $\frac{1}{3}$ of it; find the number.

Group II 5 Rationalize the denominator of $\frac{a^2-b^2}{\sqrt{a-b}}$; $\frac{a^2-a\sqrt{b}+b}{a-\sqrt{b}}$

6 Reduce to similar surds $\sqrt[3]{500}$, $\sqrt[3]{1372}$

Simplify $3\sqrt{55} \times 2\sqrt{33}$

7 Solve $\frac{\sqrt{x^2-5}+1}{\sqrt{x^2-5}-1} = 3$

8 Expand by the binomial formula $\left(\frac{x}{y}-2y\right)^6$

Group III 9 Solve $\begin{cases} x-y=5 \\ \sqrt{x}-\sqrt{y}=1 \end{cases}$

10 My annual income is \$892; $\frac{1}{4}$ of my property is invested at 5%, $\frac{1}{4}$ at 4%, $\frac{1}{4}$ at 3% and the balance at 2%. How much property have I?

11 Solve $x^4-3x^2=4$. Find four roots.

12 The number of square feet in the area of a rectangle exceeds by 87 the number of linear feet in its perimeter; its length and width are in the ratio of 5 to 3. Find the dimensions of the rectangle.