197TH HIGH SCHOOL EXAMINATION

INTERMEDIATE ALGEBRA

Monday, January 25, 1909—9.15 a. m. to 12.15 p. m., only

Answer eight questions, selecting at least two from each group.

Group I 1 Solve as a quadratic $x^2+2x+10-\sqrt{x^2+2x+10}=20$ Verify *two* values of x obtained.

2 A laborer received $15 for a certain number of days work; if he had received 25 cents less a day, it would have taken him 2 days longer to earn the same amount. How long did he work?

3 Solve $\begin{cases} x+y+\sqrt{x+y}=12 \\ x-y+\sqrt{x-y}=2 \end{cases}$

4 Factor *three* of the following:

x^4+4; $m^2-2mn+n^2+5m-5n$; $a^2-n^2-m^2-2ab+2mn+b^2$; $x^5+7x^4-7x^3-49x^2+6x+42$

Group II 5 Find the value of $\frac{\sqrt{a}-\sqrt{x}}{\sqrt{a-x}}$ when $x=a$. Interpret your result.

6 Extract the square root of each of *two* of the following: $7+4\sqrt{3}$; $3+\sqrt{5}$; $2a+2\sqrt{a^2-b^2}$

7 Simplify *two* of the following: $(3\sqrt[4]{\frac{1}{b}})^2$; $\sqrt[3]{\frac{a}{bc}}\cdot\sqrt{\frac{a}{bd}}$; $\frac{3\sqrt{11}}{2\sqrt{98}}\cdot\frac{7\sqrt{22}}{5}$; $\sqrt{24}+\sqrt{54}-\sqrt{6}$

8 Multiply $a^{\frac{1}{2}}+a^{\frac{1}{4}}-3a^{\frac{1}{8}}+1-a^{-\frac{1}{8}}+a^{-\frac{1}{4}}$ by $a^{\frac{1}{4}}-2+a^{-\frac{1}{4}}$

Group III 9 Derive the formula for the last term and for the sum of an arithmetical progression.

10 In a geometrical progression $a=2$, $r=\frac{1}{2}$, $l=\frac{1}{16}$; find s and n.

11 What two numbers whose difference is d are to each other as $a:b$?

12 Reduce *each* of the following to its simplest form with positive exponent: $a^8\cdot a^{-2}$; $(3a)^{-5}\cdot(3a)^5$; $a^{m-3}\cdot a^{3-2m}$; $\frac{8a^{-x}b^{-y^2}}{a^{3x}b^{5y^2}}$