The University of the State of New York

EXAMINATION FOR QUALIFYING CERTIFICATES

ELEMENTARY ALGEBRA

Monday, September 8, 1919—9.15 a. m. to 12.15 p. m., only

Answer question 1 and five of the others. Credit will not be granted unless all operations (except mental ones) necessary to find results are given; simply indicating the operations is not sufficient. Each answer should be reduced to its simplest form. Papers entitled to less than 75 credits will not be accepted.

Fifty credits are assigned to question 1 and 10 credits to each of the others.

1 *a* From $h-3k+m+n$ subtract the sum of $2h-k+m-n$ and $h-2k-m-2n$

b Multiply $2c^3+c+3$ by c^3-2c-2. Check.

c Divide $m^4+6m^3+6m^2-12m-16$ by m^2-2

d Factor $9m^2-12mn+4n^2$

$3x^2-5x-12$

$4a^3-a$

a^2b-a^2-ab+a

e Reduce to lowest terms $\frac{s^2+2s-8}{s^2-8}$

f Simplify $\frac{1}{n+4}-\frac{1}{1-n}+\frac{n-6}{n^2+3n-4}$

g Simplify $\frac{a^2b^2+3ab}{4a^2-1}\times\frac{a^2-3a+2}{a^2b-ab}\div\frac{ab+3}{2a+1}$

h Solve $\frac{a+1}{a+x}=\frac{-1}{a-x}$

i Solve $12x^2+5x-2=0$

j Simplify $\sqrt[3]{81}+2\sqrt{\frac{5}{16}}-\sqrt[3]{192}+\sqrt{125}$

2 *a* Express in square yards the area of a rectangle that is 9 feet long and *a* feet wide.

b A father is now twice the age of his son; if x represents the father's age now, express the son's age two years ago.

c The greater of two numbers is m times the less; if x represents the less, express the sum of the numbers.

d If *a* apples cost *m* cents, how many can be bought for *d* dollars?

3 Extract the square root of $4x^2+20x+29+\frac{10}{x}+\frac{1}{x^2}$

4 A man wjshing to give 35 cents to each of a certain number of boys, finds that he lacks 20 cents but that he can give each boy 33 cents and have 4 cents left; what sum has he?

5 Solve correctly to *two* decimal places the following: $x-4=\sqrt{12-x-x^2}$

6 The quotient obtained by dividing one of two numbers by the other is .75; the product of the numbers is 300. Find the numbers.

7 Solve the following equations: $\begin{cases}3x+4y=9\\4x+y^2=37\end{cases}$

Check the solutions.

8 *a* Solve for t the equation $S=\frac{1}{2}gt^2$

b Find the value of t when $g=32.16$ feet, $S=787.92$ feet.

9 If 6 pounds of sugar and 1 pound of coffee cost 98 cents and, at the same price, 2 pounds of coffee and 4 pounds of sugar cost $1.12, what is the price of each per pound?