The University of the State of New York

225TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Wednesday, June 15, 1921—9.15 a. m. to 12.15 p. m., only

Write at top of first page of answer paper (a) name of school where you have studied, (b) number of weeks and recitations a week in elementary algebra. The minimum time requirement is five recitations a week for a school year.

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.

1 *a* Multiply $3x^2-x-5$ by $2x^2+5x$ and check, letting $x=2$ Multiplication [4], check [2]

b Factor *four* of the following:

$7x^5-7x$ [2]
m^2+6m-7 [2]
$3x^2-2xy-8y^2$ [2]
$ax^2-6ax^2y+9axy^2$ [2]
$9a^2+4bc-4c^2-b^2$ [2]

[No partial credit allowed on any part.]

c Represent as a single fraction in its lowest terms:

$$\left(\frac{4x}{x^2-4}+\frac{2}{2-x}\right)\div\frac{6x}{x^2-3x-10}$$

Addition [4], division [2]

d Solve for x and y:

$$\frac{3x}{a}+\frac{2y}{b}=3$$

$$\frac{2x}{a}-\frac{6y}{b}=-\frac{5}{3}$$

First solution [4], second solution [2]

e Simplify *each* of the following radicals and unite the results into a single term:

$$\sqrt{27x^3}-\sqrt{3(7x-2)^2}+6\sqrt{\frac{4x^3}{3}}$$

First [1], second [1], third [2], uniting [2]

[No partial credit allowed on any part.]

f Multiply $2\sqrt{6}+3\sqrt{3}$ by $3\sqrt{3}-5\sqrt{6}$ and simplify. Multiplying [4], simplifying [2]

g Solve and check:

$$\frac{x}{x+2}=\frac{x+2}{2x}-\frac{1}{2}$$

Solution [4], check [2]

h Solve and check:

$$\frac{3}{5}(x-7)=\frac{3x-11}{5}-\frac{3x-2}{2x-5}$$

Solution [5], check [1]

2 If three times the square of a certain number is increased by four times the number, the sum equals 39; find the number. Equation [7], solution [3]

3 Solve the following equation and find the roots to the *nearest* hundredth: $3x^2=2+4x$ [10]

4 Solve for x and y and group your answers:

$$2x-y=7$$
$$5x^2-3y^2=-7$$

First solution [6], second solution [2], grouping [2]

5 *a* Solve for r:

$$\frac{E}{e}=\frac{E+r}{r}$$ [5]

b Find the value of r to the *nearest* tenth when $E=7.8$, $e=2.3$, $R=52.7$ [5]

[No partial credit allowed on either part. Credit given *b* independent of *a*.]

6 Find the square root of

$$36a^4+12a^3+9-35a^2-6a$$ [10]

7 A and B, partners in a business, agree to divide their profits so that A will have 30% more than B, since A owns the building; how should they divide a profit of $18,400? Equation [7], solution [3]

8 Answer *each* of the following:

a The perimeter of a square is $2s$ inches; what is its area? [4]

b A man walks m miles in h hours; how far can he walk in 3 hours? [3]

c If a man can do a piece of work in d days, what part of the work can he do in 2 days? [3]

9 The temperature readings for a certain town from 8 a. m. to 6 p. m. for one day are given in the following table:

Hour	8	9	10	11	12	1	2	3	4	5	6
Reading	10°	12°	16°	23°	32°	40°	43°	43°	41°	34°	29°

a Make a graph of the above table. [6]

b Determine from the graph the approximate temperature at 11.30 a. m. [1]

c Determine from the graph the time when the reading was 35°. [2]

d Determine from the graph during what hour there was no change in temperature. [1]