The University of the State of New York

221ST HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Tuesday, June 17, 1919—1.15 to 4.15 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* From $-5x^3-3x^2+4$ subtract $2x^3-3x^2-5x+8$ and find the numeric value of the remainder when $x=2$ [6]

b Simplify $2a-3(a-1)-[a-2(2a-1)]$ [4]

c Find the quotient and the remainder when
$$49x^4-25x^2-20x-24$$
is divided by $7x^2-5x-4$ [6]

d Find the prime factors of
$$25a^2b^4-16a^4b^2$$
$$1+6ab+9a^2b^2$$
$$x^2-x-12$$
$$a^2-2ab+b^2-c^2$$
$$a^2-10a+16$$ [5]

e Change the fraction $\frac{m-n}{m+n}$ to an equivalent fraction having m^2-n^2 for a denominator.   [4]

f Simplify $\frac{b^2}{b^2-1}+\frac{b}{b+1}-\frac{b}{1-b}$ [6]

g Solve $\begin{cases} 11x+2y=23 \\ 9x-y=-26 \end{cases}$ [6]

h Multiply $2\sqrt{6}+5\sqrt{3}-3\sqrt{2}$ by $2\sqrt{3}-\sqrt{2}$ [5]

i Solve $\frac{a-bx}{c}+b=\frac{bc-x}{c}$ [8]

2 *a* In how many hours can a boy walk m miles at the rate of c miles an hour?

b Sugar is sold at $9\cent$ a pound; how many pounds can be obtained in exchange for e dozen eggs at c cents a dozen?

c Find in feet the sum of y yards, f feet and i inches.

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d Express the number whose digits in order are a, x, m and y.

3 *a* Solve for F the formula $C=\frac{5}{9}(F-32)$

b Evaluate the formula $V=\pi r^2 h$ when $\pi=\frac{22}{7}$, $r=14$ and $h=7.42$

4 Eliminate a between the formulas (equations) $F=Ma$ and $s=\frac{1}{2}at^2$, thereby obtaining a formula that does not contain a.

5 In building a macadam road the county pays 50% as much as the state, and the town pays 60% as much as the county; if the road through a town costs $24,000, find the share of each.

6 How much water must be added to a gallon of alcohol, which is 90% pure, to reduce it to 80% pure?

7 One machine can make 100 dozen buttons in 48 minutes; a smaller machine can make the same number in 1 hour and 12 minutes. How long will it take both machines together to make 100 dozen buttons?

8 Find *three* consecutive numbers such that if they are divided by 2, 3 and 4 respectively, the sum of the quotients will equal the next higher consecutive number.

9 One number is $\frac{2}{3}$ of another number and their product plus their sum is 69; find the numbers.

10 Solve $\begin{cases} 9y^2-6y-5=3x \\ 9y+x+5=0 \end{cases}$

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DIRECTIONS FOR RATING

The direction, "Less than 60% of the credit should be granted when an error in computation occurs," should be followed in rating all incorrect answers to questions which fall under the topics mentioned in "Suggestions on the Rating of Regents Examination Papers in Mathematics" under "Elem. Alg. 10."

In rating all problems, see "Suggestion 12."

No credit should be allowed for checks unless made in <u>original statements.</u>

Except in schools where the "committee system" is used, teachers are urged to mark papers cumulatively, that is, to add the credits earned by each answer to the total credits earned by preceding answers so that the mark given to the last answer is the per cent to which the paper is entitled, e. g. consecutive answers earning 5, 7, 4 etc. respectively should be marked 5, 12, 16 etc.

1 50 credits

a 6 credits. Allow 3 credits for correct subtraction and 3 credits for correct numeric value of the remainder. Allow no partial credit on either part.

b 4 credits. Allow no partial credit.

c 6 credits. Allow no partial credit.

d 5 credits (1 each).

e 4 credits. Allow no partial credit.

f 6 credits. Allow 4 credits for expressing the sum with the least common denominator and 2 credits for correctly combining the terms.

g 6 credits. Allow 4 credits for first correct result and 2 credits for second correct result.

h 5 credits. Allow 3 credits for correct multiplication and addition. Allow 2 credits for simplification.

i 8 credits. See General Suggestion 3.

2 10 credits

a 1 credit

b 2 credits

c 3 credits

d 4 credits

Allow no partial credit on *a*, *b*, *c* or *d*.

3 10 credits

a 5 credits. Allow no partial credit.

b 5 credits. Allow 1 credit for correct substitution and 4 credits for correct evaluation.

4 10 credits. Allow no partial credit.

5 10 credits

Allow 6 credits for correct equation.

Allow 4 credits for correct solution.

6 10 credits

Allow 6 credits for correct equation.

Allow 4 credits for correct solution.

7 10 credits

Allow 6 credits for correct equation.

Allow 4 credits for correct solution.

8 10 credits

Allow 6 credits for correct equation.

Allow 4 credits for correct solution.

9 10 credits

Allow 6 credits for correct equation.

Allow 4 credits for correct solution.

10 10 credits

Allow 6 credits for the first pair of roots.

Allow 4 credits for the other pair of roots.