To the Teacher in Charge of the Examination in Elementary Algebra:

Question no. 1 on the elementary algebra paper is set as a test in accuracy on the mechanical processes in algebra. Partial credits, therefore, are not allowed; for example, in an equation which involves the clearing of fractions and the solution of the resulting equation, each step must be correctly performed in order to receive credit for that step. [See no. 1 *e*.]

Many teachers have expressed the opinion that a question of this character would not present to the minds of the pupils so many difficulties if it were possible to indicate the exact distribution of credits allotted to each portion of the question. Such distribution of credits can not be readily indicated on a question paper itself. Therefore, in order that the exact allotment of credits in question no. 1 may be clearly shown to the pupils taking this examination, and with the hope that this definite statement of credits will simplify their work and render it easier, the following directions for rating question no. 1 should be written on the blackboard at the beginning of the examination. No other directions or explanations are permitted.

Question No. 1

Part a 2 credits allowed for correct subtraction and 4 credits for correct substitution and check.

Part b 5 credits allowed for correct division and 1 credit for correctly writing the result.

Part c 2 credits allowed for correctly factoring each algebraic expression.

Part d 3 credits allowed for the correct value of the first unknown, 2 credits for the correct value of the second unknown and 1 credit for the check.

Part e 3 credits allowed for correctly clearing the equation of fractions and 3 credits for correctly solving the resulting equation.

Part f 3 credits allowed for expressing the sum with the least common denominator, 2 credits for correctly combining terms and 1 credit for reducing to lowest terms.

Part g 4 credits allowed for correct multiplication and 2 credits for correctly combining the results.

Part h 4 credits allowed for correct solution and 2 credits for correct checking.

The University of the State of New York

EXAMINATION FOR QUALIFYING CERTIFICATES

ELEMENTARY ALGEBRA

Tuesday, January 20, 1920—1.15 to 4.15 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.

1 *a* From $6x^2+8x-2$ take $2x^2-3x+5$ and check the result, letting $x=2$ [6]

b Divide $6x^3+5x^2-4x+2$ by $2x+3$ and write the result as a mixed expression. [6]

c Factor $9x^2-y^2$

$r^2s^2-4r^6s^2$

$c^2+3c-54$

$x^2+6x-16y^2+9$ [8]

d Solve and check:

$$\begin{cases} 5x-4y=-43 \\ 2x+3y=15 \end{cases}$$ [6]

e Solve $\frac{2x}{6}-\frac{x-3}{3}=12-\frac{x+4}{2}-x$ [6]

f Express as a single fraction in its lowest terms: [6]

$$\frac{4x}{x^2-4}+\frac{3x-2}{4-x^2}$$

g Multiply and simplify the result: [6]

$(2\sqrt{3}-3\sqrt{5})$ by $(\sqrt{3}+2\sqrt{5})$

h Solve for x and check either result: [6]

$$\frac{7x}{6}=\frac{1}{2}-x^2$$

2 Solve for l in the formula $S=\frac{n}{2}(a+l)$ [10]

3 Solve for x and y, correctly group your answers and check:

$$\begin{cases} 2x-3y=3 \\ x^2-4xy=-3 \end{cases}$$ [10]

4 In the formula $h^2=a^2+b^2$, find the value of b to *two* decimal places, i. e. to the nearest hundredth, when $h=7$ and $a=1$ [10]

5 The difference between two numbers is 13 and their sum is 77; find the two numbers. [10]

6 Milk is sold at 16¢ a quart and cream at 72¢ a quart; how many quarts of each will be needed to make 18 quarts of a mixture to sell for $6.24? [10]

7 *a* If a man's rate of rowing in still water is S miles an hour and the current flows at the rate of C miles an hour, express the man's rate (1) when rowing with the current, (2) when rowing against the current. [4]

b An odd number is represented by $2n+1$. Represent the next two consecutive odd numbers. [2]

c If tennis balls cost r cents a dozen last year and the price has advanced 60¢ a dozen, how much will a half dozen cost at the present rate? [4]

8 The length of a given rectangle exceeds its width by 4 yards and the area of the rectangle is 82 square yards; find the dimensions of the rectangle correct to the nearest tenth. [10]

9 The average weight of boys at different ages beginning at 6 years and continuing to 15 years is given in the table below:

Age:	6	7	8	9	10	11	12	13	14	15
Weight (in pounds):	50	53	57	62	67	72	78	85	93	105

a Make a graph of this table. [8]

b A boy, normal in every respect, weighs 87 pounds; what is his approximate age? Show how this approximation is made from the graph. [2]

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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 original statements.

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.

NOTE:—The attention of the examiner is called to the inclosed letter to the teacher, which contains the directions for rating question no. 1. These directions should be written on the blackboard at the beginning of the examination.

1 50 credits

a 6 credits. Allow 2 credits for correct subtraction and 4 credits for correct substitution and check. Allow no partial credit on either part.

b 6 credits. Allow 5 credits for correct division and 1 credit for correctly writing the result. Allow no partial credit on either part.

c 8 credits. Allow 2 credits each. Allow no partial credit on any part.

d 6 credits. Allow 3 credits for the first solution, 2 credits for the second solution and 1 credit for the check. Allow no partial credit on any part.

e 6 credits. Allow 3 credits for correctly clearing the equation of fractions and 3 credits for correct solution. Allow no partial credit.

f 6 credits. Allow 3 credits for expressing the sum with the least common denominator, 2 credits for correctly combining terms and 1 credit for reducing to lowest terms. Allow no partial credit.

g 6 credits. Allow 4 credits for correct multiplication and 2 credits for correctly combining results. Allow no partial credit.

h 6 credits. Allow 4 credits for correct solution and 2 credits for correct checking. Allow no partial credit.

2 10 credits. Allow no partial credit.

3 10 credits

Allow 6 credits for the first solution, 2 credits for the second solution and 2 credits for the check. Allow no partial credit on any part.

4 10 credits

Allow 8 credits if written 6.92 or 6.928.
Allow 10 credits if written 6.93.

5 10 credits

Allow 6 credits for correct equation and 4 credits for correct solution of equation. Allow no partial credit on either part.

6 10 credits

Allow 7 credits for correct equations and 3 credits for correct solution of equations. Allow no partial credit on either part.

7 10 credits

a 4 credits

b 2 credits

c 4 credits

Allow no partial credit on any part.

8 10 credits

Allow 5 credits for forming the equation. Allow 5 credits for the solution if written 7.3 and 11.3.
Allow 4 credits for the solution if written 7.2 and 11.2 or 7.27 and 11.27.

9 10 credits

a 8 credits

b 2 credits