The University of the State of New York

218TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Tuesday, January 22, 1918—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 the first six questions and four 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 Multiply $3x^2+2xy-8y^2$ by $2x^2-5xy+4y^2$ [10]

2 Perform the indicated operations [6] and check your work by substituting 3 for x and 2 for y [4]:

$$\frac{x-y}{3x+2y}+\frac{12xy}{9x^2-4y^2}-\frac{x+y}{3x-2y}$$

3 Find the prime factors of *each* of the following: [10]

x^2-x-6

$2a^2-ab-b^2$

$ac+cb-ad-bd$

$2a^2+5ab-3b^2$

$x^2-25y^2z^2$

4 *a* Simplify $\sqrt{18a}-2\sqrt{\frac{a}{2}}+3\sqrt{50a}$ [4]

b Find the value of $\sqrt{b^2-4ac}$ when

$a=2 \quad b=3 \quad c=-5$

$a=8 \quad b=-8 \quad c=2$

$a=\frac{1}{8} \quad b=\frac{1}{2} \quad c=\frac{1}{4}$ [6]

5 Solve for x [6] and check [4]: $2x^2+x-21=0$

6 Solve for x and y [8] and check [2]:

$x^2+y^2=26$

$x-y=-4$

7 Solve for y [8] and check [2]:

$$\frac{3y-2}{y+4}-\frac{y+5}{5-y}=\frac{4y^2+3y-3}{y^2-y-20}$$

8 Extract the square root of

$10x^2-4x^3+x^4-12x+9$ [7]

Check. [3]

9 *a* Solve for v in terms of h and g:

$$h=\frac{v^2}{2g}$$

What is the value of v if $h=25$ and $g=32$? [6]

b How many pounds of sugar at b cents a pound would cost as much as e dozen of eggs at c cents a dozen? [4]

10 A is 60 miles from B. An automobile at A starts for B at the rate of 20 miles an hour at the same time that an automobile at B starts for A at the rate of 25 miles an hour. How long will it be before the automobiles will pass each other? [10]

11 *a* How many yards are there in c inches?

b A boy will be y years old 2 years hence; how old was he 4 years ago?

c A book cost d dollars; how many dollars will have to be paid for a second book if it costs c cents more than the first?

d A rectangle is b inches long and c inches wide; find its area and its perimeter. [10]

12 Two farm cadets have set out 600 tomato plants; the number of plants in each row is 10 less than twice the number of rows. How many plants are there in each row? [10]

13 A rectangular piece of paper is twice as long as a square piece and 3 inches wider; the area of the rectangular piece is 108 square inches. Find the dimensions of the square piece. [10]

14 Solve for c correctly to *two* decimal places: [10]

$c^2+4c-1=0$

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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. 12."

In all problems solved with two unknowns, no credit should be given for one equation correctly formed if the other is not given or is inaccurate.

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.

1 10 credits
Allow no partial credit.

2 10 credits
Allow 3 credits for reducing fractions to least common denominator.
Allow 3 credits for correct addition.
Allow 4 credits for correct check.

3 10 credits
Allow 2 credits each.

4 10 credits
a 4 credits.
Allow 3 credits for correct simplification (1 each).
Allow 1 credit for correct addition.
b 6 credits. Allow 2 credits each, 1 for correct substitution and addition, 1 for correct simplification.

5 10 credits
Allow 4 credits for first correct result.
Allow 2 credits for second correct result.
Allow 4 credits for correct checks (2 each).

6 10 credits
Allow 5 credits for first correct result.
Allow 3 credits for other correct results (1 each).
Allow 2 credits for correct checks (1 each).

DIRECTIONS FOR RATING—*concluded*

7 10 credits
Allow 5 credits for clearing fractions correctly.
Allow 3 credits for correct result.
Allow 2 credits for correct check.

8 10 credits
Allow 3 credits for first two correct terms of the root.
Allow 4 credits for third term of root if work is finished correctly.
Allow 3 credits for correct check.

9 10 credits
a 6 credits. Allow 3 credits for expressing v in terms of h and g. Allow no partial credit. Allow 3 credits for correct value of v.
b 4 credits. Allow no partial credit.

10 10 credits
Allow 6 credits for correct equation.
Allow 4 credits for correct solution.

11 10 credits
a Allow 2 credits.
b Allow 2 credits.
c Allow 2 credits.
d Allow 4 credits (2 each).
Allow no partial credit on *a*, *b*, *c* or on either part of *d*.

12 10 credits
Allow 6 credits for correct equation.
Allow 4 credits for correct solution.

13 10 credits
Allow 6 credits for correct equation.
Allow 4 credits for correct solution.

14 10 credits
Allow 6 credits for finding $c=-2\pm\sqrt{5}$
Allow 4 credits for finding correct decimal values (2 each).