The University of the State of New York

217TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Tuesday, June 19, 1917—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 10 questions. 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 Solve $\frac{5}{x-7}-\frac{7}{x+3}=\frac{5x+1}{x^2-4x-21}$ [7]

Check the result. [3]

2 Factor and simplify

$$\frac{a^3-11a+30}{a^3-6a^2+9a}\times\frac{a^2-3a}{a^2-25}\div\frac{a^2-9}{a^2+2a-15}$$ [8]

Check by substituting 2 for a. [2]

3 The area of a trapezoid is expressed by the formula $a=\frac{h}{2}(b+b')$, in which h denotes the hight, b and b' the two bases.

a Find h in terms of a, b and b' [5]

b Find the value of b, if $a=35$, $b'=10$ and $h=5$ [5]

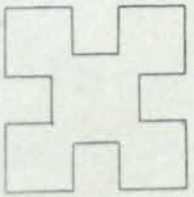
4 Simplify $\frac{4}{a-3}-\frac{a-1}{a^2+3a+9}+\frac{a^2-38a-3}{a^3-27}$ [10]

5 *a* Simplify $2\sqrt{150}-4\sqrt{54}+6\sqrt{24}$ [5]

b Simplify $(\sqrt{6}-2\sqrt{5})^2$ [5]

6 Solve $\sqrt{2+x}-4+\sqrt{10-3x}=0$ [8] Check the result. [2]

7 The figure represents a steel plate which had the form of a square of side a, from which four smaller squares, each of side b, have been cut.



a Find the area of the plate as shown in the figure. [4]

b If $a=96$ and $b=2$, explain how the area may be found by a short process. [6]

8 An automobile is traveling at the rate of 20 miles an hour; at what rate must a second automobile travel which starts 2 hours after the first and wishes to overtake it in 4 hours? [10]

9 A printing press did a certain piece of work in 4 hours; when a second press was installed, a similar job was completed by both machines in $2\frac{1}{2}$ hours. In how many hours could the second press alone have done the work? [10]

10 Solve $\begin{cases} x^2-xy+y^2=7 \\ 2x-3y=0 \end{cases}$ [8]

Check one set of roots. [2]

11 The dimensions of a rectangular block are e, $e+3$ and $e+5$.

a Find (1) the sum of all the edges, (2) the total surface of the block, (3) the volume of the block. [7]

b If $e=3$, find the value of *each* of these expressions. [3]

12 *a* Solve $4x+5=2x-7$ State which of the four fundamental operations is used in each step of the solution. [4]

b Find by a short process the value of each of *three* of the following expressions, in each case clearly indicating the process: (1) 51^2, (2) 31×29, (3) 39^2, (4) $25\times9\times4$, (5) 2^{19}, given $2^{10}=1024$ [6]

13 The admission to an entertainment was 50¢ for adults and 25¢ for children; the total receipts from 150 tickets were $62.50. Find (*a*) the number of adults admitted, (*b*) the number of children admitted. [10]

14 If the side of a square is increased by 5 the area is multiplied by 4; find the side of the square. [10]

15 Solve $x^2-2ax=b^2-a^2$ [10]

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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 4 credits for clearing of fractions correctly.
- Allow 3 credits for correct solution.
- Allow 3 credits for correct check.

2 10 credits
- Allow 6 credits for correct factors (1 for each expression).
- Allow 2 credits for correct inversion, cancelation and writing of answer.
- Allow 2 credits for correct check.

3 10 credits
- *a* 5 credits. No partial credit.
- *b* 5 credits. Allow 2 credits for correct substitution. Allow 3 credits for correct solution.

4 10 credits
- Allow 3 credits for reducing fractions to the least common denominator.
- Allow 4 credits for reducing to $\frac{4a^3-22a+30}{a^3-27}$
- Allow 3 credits for reducing to simplest form.

5 10 credits
- *a* 5 credits. Allow 3 credits for correct simplification (1 each). Allow 2 credits for correct addition.
- *b* 5 credits. Allow 4 credits for correct expansion of binomial. Allow 1 credit for correct addition.

6 10 credits
- Allow 5 credits for removing radicals correctly.
- Allow 3 credits for correct solution.
- Allow 2 credits for correct check.

7 10 credits
- *a* 4 credits. No partial credit.
- *b* 6 credits.

8 10 credits
- Allow 6 credits for correct equation.
- Allow 4 credits for correct solution.
- Allow no credit if solved by arithmetic.

9 10 credits
- Allow 6 credits for correct equation.
- Allow 4 credits for correct solution.
- Allow no credit if solved by arithmetic.

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

11 10 credits
- *a* 7 credits. (1) 2 credits. (2) 3 credits. (3) 2 credits. Allow no partial credit on (1), (2) or (3).
- *b* 3 credits (1 each).

12 10 credits
- *a* 4 credits. Allow 2 credits for correct solution. Allow 2 credits for correct statements (1 each).
- *b* 6 credits (2 each).

13 10 credits
- Allow 6 credits for correct equations.
- Allow 4 credits for correct results (2 each).
- Allow no credit if solved by arithmetic.

14 10 credits
- Allow 6 credits for correct equation.
- Allow 4 credits for correct solution.
- Allow no credit if solved by arithmetic.

15 10 credits
- Allow 6 credits for one correct result.
- Allow 4 credits for the other correct result.