

The University of the State of New York
239TH HIGH SCHOOL EXAMINATION
ELEMENTARY ALGEBRA
Monday, June 13, 1927 — 9.15 a. m. to 12.15 p. m., only

Fill in the following lines:

Name of school.....Name of pupil.....

Instructions

Do not open this sheet until the signal is given.

Answer all questions in part I and five questions from part II.

Part I is to be done first and the maximum time to be allowed for this part is one and one half hours. Merely write the answer to each question in the space at the right; no work need be shown.

If you finish part I before the signal to stop is given you may begin part II. However, it is advisable to look your work over carefully before proceeding to part II, since *no credit will be given any answer in part I which is not correct and reduced to its simplest form.*

When the signal to stop is given at the close of the one and one half hour period, work on part I must cease and this sheet of the question paper must be detached. The sheets will then be collected and you should continue with the remainder of the examination.

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Part I

Answer all questions in this part. Each question has $2\frac{1}{2}$ credits assigned to it. Each answer must be reduced to its simplest form.

1 When $V = 4$ and $t = 1$, find the value of $(V + t)(V - t)$ Ans.....

2 Simplify $(x - y)^2 - 2(x^2 + 2xy - y^2)$ Ans.....

3 What is the remainder when $6a^2 - 7a + 12$ is divided by $3a - 2$? Ans.....

4 In the formula $A = \frac{bh}{2}$, $A = 8$ and $h = 3$; find b . Ans.....

5 Robert was gone m hours on an automobile trip. During this time he stopped d hours at the home of a friend. If his speed while driving was 30 miles an hour, how many miles did he drive? Ans.....

6 Factor $6a^2 + 12ab + 8ac$ Ans.....

7 Factor $9a^2 - 16$ Ans.....

8 Express as a single fraction in its simplest form $\frac{a^2 + 2a - 3}{b} \div \frac{4a + 12}{2b^2}$ Ans.....

9 Express as a single fraction in its simplest form $\frac{3c}{c^2 - d^2} - \frac{2}{d - c}$ Ans.....

10 State the operation used in reducing the equation $\frac{2x - 3}{4} = \frac{x}{5} + 4$ to the form $10x - 15 = 4x + 80$ Ans.....

11 The sum of two numbers is 12 and their difference is 4; find the larger number. Ans.....

12 Solve for L the formula $r = \frac{v^2 p L}{a}$ Ans.....

13 Simplify $\sqrt{\frac{8}{3}}$ Ans.....

14 In an equilateral triangle the area A is expressed by the formula, $A = \frac{b^2 \sqrt{3}}{4}$, where b is the length of one side of the triangle. If $b = 4$, find the area to the nearest tenth. Ans.....

15 Write as a single term $\sqrt{24} - 3\sqrt{6} + 4\sqrt{54}$ Ans.....

16 State whether or not the values, $x = 5$, $y = 10$, satisfy the following set of equations:
 $2x - y = 0$
 $4x + 3y = 60$ Ans.....

17 Solve the following equation for x :
 $x^2 - 5x = -6$ Ans.....

18 What number added to both members of the equation $y^2 + 6y = 15$ will make the first member of the equation a perfect square? Ans.....

19 A rectangular flower plot is 3 feet longer than it is wide. Express by an equation in x the fact that this plot has an area of 54 square feet. Ans.....

20 In the equation $a + \frac{a - 3}{4} = 3$, which one of the numbers, 4, -3, 3, -4, is the root (answer)? Ans.....

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Write at top of first page of answer paper to part II (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.

Part II

Answer five questions from this part. Full 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.

21 Twice a certain number added to another number equals 9. Five times the first number multiplied by two times the second number equals 40. Find the two numbers and check. [6, 3, 1]

22 Two machinists working at similar machines are paid in proportion to the number of parts turned out. A turns out 24 parts in the same time that B turns out 32. If A earns \$36 a week, how much does B earn a week? [6, 4]

23 In a basketball game $\frac{4}{5}$ of the points made by the winning team was 20 more than the points made by the losing team. In all a total of 70 points was made. What was the score? [6, 4]

24 At a freshman class candy sale fudge was sold at 60 cents a pound and "Turkish delight" at 40 cents a pound. In all 30 pounds of candy were sold. After \$1.50 had been deducted for expenses, \$14.10 was left for the class treasurer. How many pounds of each kind of candy were sold? [6, 4]

25 In the formula $R_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$, $a = 10$, $b = -3$, $c = -11$. Extract the required square root to the nearest tenth and find the value of R_2 to the nearest tenth. [10]

26 A boy skated across a lake with the wind, at the rate of 12 miles an hour. Returning against the wind, he went at the rate of 4 miles an hour. He made the entire trip in $1\frac{1}{2}$ hours. Find the width of the lake. [6, 4]

27 State whether each of the following statements is true or false: [Write the letters a , b , c , d , e in a column and then write the word *true* or *false* after each letter.]

a If x is an integer, $x^2 - 4x + 4$ is always greater than 1. [2]

b $\frac{x^3 - 2xy + y^3}{x + y} \times \frac{2(x + y)}{2(x - y)(x - y)} = 0$ [2]

c $16 + 24x + 9x^2$ is a perfect square. [2]

d If $\frac{1}{N} = \frac{1}{C} + \frac{1}{R}$, then $N = \frac{CR}{C + R}$ [2]

e The expression $4a$ means that a is used 4 times as a factor. [2]

28 A pupil's average standing in algebra during each of the first six weeks of the school year is given in the following table:

1st week	86	4th week	88
2d week	75	5th week	90
3d week	80	6th week	92

Represent this information by means of a bar graph. [10]