The University of the State of New York

238TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 17, 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 1

Answer all questions in this part. Each question has 2½ credits assigned to it. Each answer must be reduced to its simplest form.

1 If $x = 3$, find the value of $x^2 - 7x - 9$ *Ans.....*

2 From $11x^2 + 7x - 4$ subtract $6x^2 - 2x - 4$ *Ans.....*

3 What number divided by 5 gives a quotient of 13 and a remainder of 2? *Ans.....*

4 Multiply $x^2 + 2x + 4$ by $x - 2$ *Ans.....*

5 Factor $4x^2 - 28xy + 49y^2$ *Ans.....*

6 Factor $3x^2 + 7x - 6$ *Ans.....*

7 Express the product 98×102 as the difference between two squares. *Ans.....*

8 Express as a single fraction

$$\frac{4x+3}{5} - \frac{2x-3}{6}$$

Ans.....

9 Express as a single fraction

$$\frac{a^2-9}{2a+2} \div \frac{a+3}{2}$$

Ans.....

10 Find x when $\frac{4x}{7} + \frac{11}{5} = \frac{6x}{5}$ *Ans.....*

11 If x bags of coal weigh y pounds, what will 2 bags weigh? *Ans.....*

12 Using only *one* letter, represent *three* numbers proportional to 2, 4 and 5, that is, having the ratios 2:4:5 *Ans.....*

13 If $5x - 4y = 15$ and $5x = 7y$, find y. *Ans.....*

14 Simplify $\sqrt{98}$ *Ans.....*

15 Write as a single term $15a\sqrt{3} - 12a\sqrt{3} + 7a\sqrt{3}$ *Ans.....*

16 Solve for P the formula $A = P(1 + rt)$ *Ans.....*

17 If A travels x miles an hour and B y miles an hour, write an equation that expresses the fact that in 5 hours A travels the same distance that B travels in 6 hours. *Ans.....*

18 Find the two values of a that satisfy the equation $a^2 - 6a = 0$ *Ans.....*

19 What value must c have in the equation $2x + c = 0$, if 3 is a root of the equation, that is, if 3 satisfies the equation? *Ans.....*

20 If a is greater than b, how does the value of $(a - b)^2$ compare with the value of $(b - a)^2$? *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 A rug is 4 feet longer than it is wide and has an area of 21 square feet; find the dimensions of the rug. [6, 4]

22 A farmer sows 13 acres with wheat and oats, obtaining a total yield of 496 bushels. If the wheat yields 32 bushels per acre and the oats 40 bushels per acre, how many acres of each did he plant? [6, 4]

23 Find the roots of $x^2 - 7x + 4 = 0$ correct to the *nearest tenth.* [10]

24 A man invested $4500 in two enterprises, the first paying 7% and the second 4% annually. If his annual income from both is $234, how much has he invested in each enterprise? [6, 4]

25 A boy rides away from home in an automobile at the rate of 28 miles an hour and walks back at the rate of 4 miles an hour. The round trip requires 2 hours. How far does he ride? [6, 4]

26 Find a fraction whose value is $\frac{9}{16}$ and whose denominator is 32 less than twice its numerator. [6, 4]

27 The difference between two positive numbers is 2 and the difference between their squares is 8; find the numbers. [6, 4]

28 The first column of the following table shows the average heights of boys 12 years old whose weights are shown in the second column:

Height in inches	Weight in pounds
50	62
52	68
54	73
56	80
58	86
60	93

a Construct a graph showing the relation of weight to height. [8]

b Determine from the graph what should be the weight of a boy whose height is 55 inches. [2]

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