

The University of the State of New York

233D HIGH SCHOOL EXAMINATION

**ELEMENTARY ALGEBRA**

Wednesday, June 17, 1925 — 9.15 a. m. to 12.15 p. m., only

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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.

# ELEMENTARY ALGEBRA

Wednesday, June 17, 1925

## Part I

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

- 1  $x - 2$  is an exact divisor of  $x^3 - 5x^2 + 8x - 4$ . What is the quotient? Ans.....
- 2 Find the value of  $x^3 - 5x^2 + 8x - 4$  when  $x = 3$ . Ans.....
- 3 Factor:  $49 - a^2$  Ans.....
- 4 Factor:  $x^2 - 8x - 20$  Ans.....
- 5 Factor:  $2x^2 - 7x - 15$  Ans.....
- 6 Factor:  $25a^2 + 30ab + 9b^2$  Ans.....
- 7 Find the square root of 59.29 Ans.....
- 8 Reduce to simplest form:  $\frac{5}{a-6} - \frac{3}{a+6}$  Ans.....
- 9 Reduce to simplest form:  $\left(1 - \frac{t}{s+t}\right)\left(\frac{s+t}{s}\right)$  Ans.....
- 10 Reduce to simplest form:  $\frac{56}{r+3} \div \frac{8}{9-r^2}$  Ans.....
- 11 Solve for  $x$ :  $\frac{x}{2} - \frac{x-4}{6} = \frac{5}{3}$  Ans.....
- 12 Solve for  $x$  and  $y$ :  $2x + 7y = 25$   
 $2x + y = 13$  Ans.....
- 13 If  $s$  pounds of coffee cost  $t$  dollars, how many pounds can be bought for  $k$  dollars? Ans.....
- 14 Simplify:  $2\sqrt{27}$  Ans.....
- 15 Simplify:  $60\sqrt{\frac{4}{45}}$  Ans.....
- 16 Simplify:  $2\sqrt{3} + (5a - 2)\sqrt{3} - \sqrt{3}$  Ans.....
- 17 Solve for  $x$ :  $2x^2 + x - 15 = 0$  Ans.....
- 18 Solve for  $n$ :  $l = a + (n - 1)d$  Ans.....
- 19 If  $a$  and  $b$  are two numbers, by how much does the square of their sum exceed the sum of their squares? Ans.....
- 20 From the following set of equations form a quadratic equation in  $x$  whose right hand member is zero.  
 $3x - y = -2$   
 $2x^2 + y^2 = -31$  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 rectangle is one and one fifth times as long as it is wide; if two feet are taken from each dimension the new rectangle thus formed will have two thirds the area of the original one. Find the area of each. [6, 4]

22 Solve for  $x$  and  $y$ :  
$$\begin{aligned} Lx + y &= -D \\ x + Ly &= D \end{aligned} \quad [10]$$

23 The amounts possessed by  $A$  and  $B$  are in the ratio 5 : 3; if  $A$  gives  $B$  \$10 they will have equal amounts. Find the amount possessed by each. [7, 3]

24 A pupil receives the following marks in algebra during one week: Monday 72, Tuesday 84, Wednesday 84, Thursday 90. What must be his mark for Friday if his average for the week is to be 85? [7, 3] [Algebraic solution is required. The average of several quantities is obtained by dividing their sum by the number of quantities.]

25 The tens digit of a certain number of two figures exceeds the units digit by 3; the sum of the digits is one seventh of the number. Find the number. [7, 3]

26 Find to the nearest tenth the roots of  $x^2 - 10x + 2 = 0$  [10]

27 The cost of setting up the type for a certain pamphlet and of printing copies is given by the formula  $c = .10n + 10$ , where  $n$  represents the number of copies and  $c$  the total cost in dollars.

a Construct a table of values for the formula, choosing values of  $n$  from 0 to 40 at intervals of 10. [3]

b Plot the graph. [4]

c From the graph find:

(1) the cost of printing 25 copies, (2) the cost of setting up the type. [2, 1]