

The University of the State of New York  
235TH HIGH SCHOOL EXAMINATION  
**ELEMENTARY ALGEBRA**  
Monday, January 18, 1926 — 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

Monday, January 18, 1926

## 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 Remove the parenthesis and brackets in the following and combine like terms:  $7a - [(5a - 3) + 3a]$  Ans.....
- 2 What is the value of  $15a^3 - 8a^2 + 2$  when  $a$  equals 2? Ans.....
- 3 Divide  $6x^3 - 23x^2 + 29x - 12$  by  $2x - 3$  Ans.....
- 4 If  $x$  diminished by 5 equals  $2x$  divided by 3, what is the value of  $x$ ? Ans.....
- 5 Given the formula  $C = \frac{5}{9}(F - 32)$ ; find  $F$  when  $C$  is 20. Ans.....
- 6 Factor  $y^2 - 8y + 16$  Ans.....
- 7 Factor  $25 - z^2$  Ans.....
- 8 Factor  $2x^2 - x - 6$  Ans.....
- 9 Express with a positive denominator  $\frac{2b-a}{-3}$  Ans.....
- 10 Reduce to simplest form  $\frac{3}{a-b} + \frac{2}{a+b}$  Ans.....
- 11 Reduce to simplest form  $\frac{3x^3}{7c} \div \frac{2x}{21c^3}$  Ans.....
- 12 Solve the following equation for  $x$ :  

$$\frac{2x}{3} - \frac{3x-5}{2} = 0$$
 Ans.....
- 13 Solve the following set of equations for  $x$  and  $y$ :  

$$\begin{aligned} x - 4y &= 1 \\ 3x + 4y &= 19 \end{aligned}$$
 Ans.....
- 14 Find the square root of 33 to the nearest tenth. Ans.....
- 15 Simplify  $\sqrt{72}$  Ans.....
- 16 Simplify  $14\sqrt{\frac{1}{2}}$  Ans.....
- 17 Simplify  $3\sqrt{5} + 2\sqrt{3} + 7\sqrt{5} - \sqrt{3}$  Ans.....
- 18 Solve  $x^2 - 8x - 20 = 0$  Ans.....
- 19 If a boat sails  $v$  miles in  $t$  hours, how far will it sail in  $k$  hours? Ans.....
- 20 Given the formula  $s = \frac{n}{2}(a + l)$ ; solve this formula for  $n$ . 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 Find to the nearest tenth the roots of  $x^2 - 3x - 5 = 0$ . [10]

22 Solve the following set of equations for  $x$  and  $y$  and check one pair of values:

$$\begin{aligned}x - y &= 2 \\ x^2 - 2y^2 &= 7\end{aligned}\quad [8, 2]$$

23 A man invested \$1000 in two enterprises. The first pays him 6% on his investment and the second 5%. If his annual income from both investments is \$56, how much did he invest in each? [6, 4]

24  $A$  travels at the rate of  $x$  miles an hour,  $B$  at the rate of  $y$  miles an hour.  $A$  can travel in 5 hours as far as  $B$  can travel in 7 hours.  $A$  travels 4 miles an hour faster than  $B$ . Find  $x$  and  $y$ . [6, 4]

25 Two integers are in the ratio 3:2. Their product exceeds their difference by 22; find the two integers. [6, 4]

26 An estate of \$5700 is to be divided among a mother, a son and a daughter. The mother is to receive \$2500 more than the son and the daughter twice as much as the son. Find the amount that each will receive. [6, 4]

27 State whether each of the following statements is true or false: [Label each answer with the corresponding letter.]

a Every quadratic equation has two roots. [2]

b If  $x$  is a negative number,  $x^2 + 5x + 6$  is greater than  $x^2 - 5x + 6$ . [2]

c The square root of any positive number is less than the number. [2]

d One of the roots of the equation  $3x^2 + 8x - 3 = 0$  is  $\frac{1}{3}$ . [2]

e The product of two binomials may be a binomial. [2]

28 If a man swims at the rate of 2 miles an hour, the formula  $d = 2t$  represents the relation between the distance ( $d$ ) and the time ( $t$ ).

a Construct a table that will give the values of  $d$  corresponding to  $t = 1, 2, 3, 4, 5, 6$ . [4]

b Plot the graph of this table. [4]

c Find and mark by a check ( $\checkmark$ ) a point on the graph that shows the time needed to cover 7 miles. [2]