

The University of the State of New York

253D HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 25, 1932 — 9.15 a. m. to 12.15 p. m., only

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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 place the answer to each question in the space provided; 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 25, 1932

Fill in the following lines:

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

Detach this sheet and hand it in at the close of the one and one half hour period.

## Part I

Answer all questions in this part. Each question has  $2\frac{1}{2}$  credits assigned to it; no partial credit should be allowed. Each answer must be reduced to its simplest form.

- 1 What is the remainder when  $4x^2 - 4x - 2$  is divided by  $2x - 1$ ? Ans.....
- 2 A man earns  $e$  dollars a month and spends  $r$  dollars a month; how many dollars will he save in 3 years? Ans.....
- 3 Write three factors of  $3x^2 - 27y^2$  Ans.....
- 4 Two numbers are represented by  $m$  and  $n$ . Write the formula for the average ( $a$ ) of these two numbers. Ans.....
- 5 Given the formula  $a = p + prt$ ; find  $t$  if  $a = \$200$ ,  $p = \$100$ ,  $r = 5\%$  Ans.....
- 6 Express as a single fraction in its simplest form  $\frac{4}{a-3} + \frac{3}{3-a}$  Ans.....
- 7 Solve the following equation for  $x$ :  
$$\frac{2x-3}{5} - \frac{x-3}{3} - 2 = 0$$
 Ans.....
- 8 If the area of a square is 62 square inches, find to the nearest tenth of an inch the length of one side. Ans.....
- 9 Solve the following set of equations for  $a$ :  
$$5a + 3b = 14$$
$$2a + b = 6$$
 Ans.....
- 10  $V = lwh$  is the formula for the volume of a rectangular solid; if  $l$  and  $w$  remain the same and  $h$  decreases, does  $V$  increase or decrease? Ans.....
- 11 Solve for  $t$  the formula  $r = \frac{d}{t}$  Ans.....
- 12 Combine into a single term:  
$$\sqrt{20} - \sqrt{\frac{1}{3}}$$
 Ans.....
- 13 One number is twice a second number and the second number is three times a third number. If  $n$  represents the third number, represent the first number in terms of  $n$ . Ans.....
- 14 Half of a certain number is 21 less than two times the number. If  $n$  represents the number, write the equation that will be used in finding  $n$ . Ans.....
- 15 Solve the following equation for  $x$ :  
$$3x^2 - 243 = 0$$
 Ans.....

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16 A team won  $a$  games and lost  $b$  games; what fractional part of all the games played did the team win?

Ans.....

17 Find the value of  $\cos 57^\circ$

Ans.....

18 Find to the *nearest degree* the angle whose tangent is .4885.

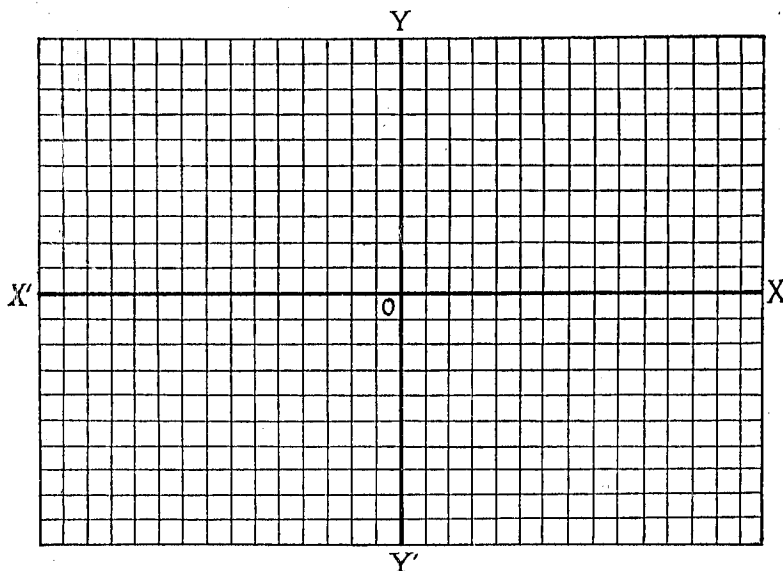
Ans.....

19 Given the equation  $x + y = 8$ ; complete the table below.

$x$	0	2	4
$y$			

Ans.....

20 Using the same values for  $x$  and  $y$  as in the completed table in question 19, make on the diagram below a graph of the equation  $x + y = 8$



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ELEMENTARY ALGEBRA

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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 man lends part of \$7200 at 4% interest and the remainder at 5%. The income is the same for each loan. How much did he lend at each rate? [7, 3]

22 For a high school entertainment 186 tickets were sold. Adults' tickets were sold for 50 cents each and children's tickets for 35 cents each. If the receipts amounted to \$75, how many tickets of each kind were sold? [7, 3]

23 Albany and New York are 150 miles apart. One car leaves Albany for New York and averages 40 miles an hour. Another car leaves New York for Albany at the same time and averages 35 miles an hour. How far from Albany will they meet? [7, 3]

24 An airplane (*A*) is 800 feet above the ground and directly over a church (*C*). The angle of elevation of the plane as seen by a boy at a point (*B*) on the ground some distance from the church is  $22^\circ$ .

a How far is the boy from the church? [6]

b How far is the boy from the plane? [4]

25 The sum of the angles of a triangle is  $180^\circ$ . Two of the angles in a certain triangle are in the ratio 3:4. A third angle is  $20^\circ$  more than the smaller of the other two angles. Find the number of degrees in each angle of the triangle. [7, 3]

26 The length of a floor is 8 feet greater than its width. If each dimension is increased by 2 feet, the area will be increased by 60 square feet. Find the dimensions of the floor. [7, 3]

27 The boys and girls of the eighth grade in a school entered a contest to see which group would save the most money in the school savings bank. The monthly standings were kept by means of a graph. In the table below are the accumulated (total) amounts that had been saved at the end of each month by each group.

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Boys	\$14	\$27	\$34	\$60	\$68	\$81	\$96	\$107
Girls	11	23	32	51	74	84	90	103

a Using a solid line to represent the boys' savings and a dotted line to represent the girls', make the graph. [7]

b If you were estimating the length of time during which the girls were ahead of the boys, mark the two points on the graph that would enable you to make this estimate. [3]

\*28 Find three consecutive odd integers such that the square of the first, increased by the product of the other two, is 224. [7, 3]

\* This question is based on one of the optional topics in the syllabus.