

The University of the State of New York

247TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 20, 1930 — 9.15 a. m. to 12.15 p. m., only

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.

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 2½ credits assigned to it; no partial credit should be allowed.
Each answer must be reduced to its simplest form.

1 If $2n + 1$ represents an odd integer, write an algebraic expression for the next larger odd integer.

Ans.....

2 The area of a rectangle equals the base times the altitude. Express this rule by a formula, using A to represent the area, b the base and h the altitude.

Ans.....

3 The formula for the volume of a rectangular solid is $V = l \times w \times h$. Find the height h in inches if $V = 288$ cubic inches, $l = 12$ inches and $w = 6$ inches.

Ans.....

4 One algebraic expression has been divided by another. Find the dividend if the divisor is $x + 1$, the quotient $x - 3$ and the remainder 4.

Ans.....

5 Solve the following equation for x in terms of b , c and d :

$$\frac{c}{d} = \frac{b}{x}$$

Ans.....

6 Solve the following set of equations for y :

$$\begin{aligned} x + 4y &= 19 \\ 2x - y &= 11 \end{aligned}$$

Ans.....

7 Write the three factors of $a^2c - b^2c$

Ans.....

8 Solve the following equation for the positive value of x :

$$\frac{x}{16} = \frac{4}{x}$$

Ans.....

9 Given $y = \frac{4-x}{2}$; does y increase or decrease as x increases from $+1$ to $+4$?

Ans.....

10 Express as a single term $4\sqrt{32} - 3\sqrt{18}$

Ans.....

11 Find the quotient if $2a^2 + 7a - 15$ is divided by $a + 5$

Ans.....

12 Find the square root of 31 to the nearest tenth.

Ans.....

13 Perform the indicated division and express the result as a single fraction in its lowest terms:

$$\frac{15a^2}{286a} \div \frac{30a^2}{76a}$$

Ans.....

14 One half of a certain number is 10 more than $\frac{1}{6}$ of the number; find the number.

Ans.....

15 A chauffeur drives a car at a uniform rate. If he drives the car 360 miles in p hours, how far can he drive it in q hours?

Ans.....

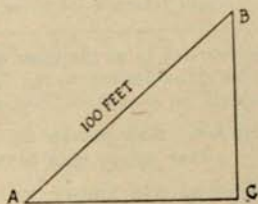
16 Is 2 a root of the equation $x^2 + x = 6$; that is, does it satisfy the equation? [Answer yes or no.]

Ans.....

17 As an acute angle increases from 0° to 90° , does its tangent increase or decrease?

Ans.....

18 A boy flying a kite lets out 100 feet of kite string AB . The string makes with the ground an angle A whose sine is .6694. Find the height BC of the kite.



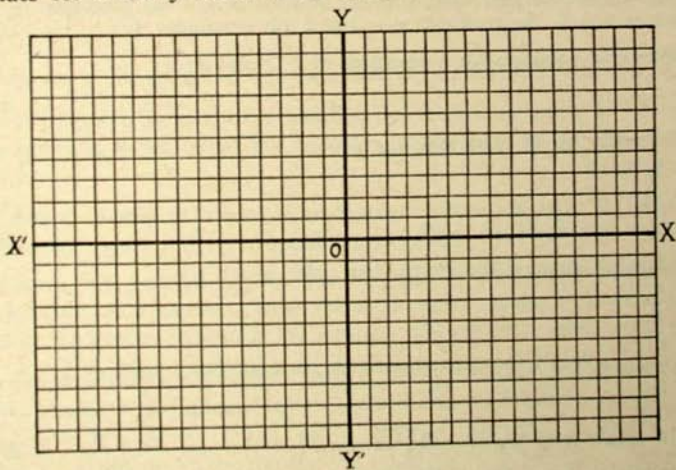
Ans.....

19-20 a If $y = x - 3$, find the three numbers needed to complete the table given below.

Ans.....

x	2	4	8
y			

b On the diagram below represent by a straight line the equation $y = x - 3$, using the values for x and y found in the table in answer to a.



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 Solve the following set of equations for x and y and check:

$$\frac{x+4}{y-3} = 3$$

$$\frac{x}{6} + \frac{y}{10} = \frac{5}{6} \quad [5, 3, 2]$$

- 22 Mary is now 15 years older than her sister Jane. Ten years from now Mary will be twice as old as her sister. Find the present age of each. [6, 2, 2]

- 23 On a holiday a troop of Boy Scouts visited the county scout cabin. They rode from headquarters to the cabin at the rate of 18 miles an hour but walked back at the rate of 2 miles an hour. The round trip took 10 hours. Find the distance from the troop headquarters to the cabin. [7, 3]

- 24 Two numbers are in the ratio 3:7 and their sum is 60; find the numbers. [6, 4]

- 25 A ladder leans against the side of a building and makes an angle of 78° with the ground. The foot of the ladder is 8 feet from the building. How high is the top of the ladder above the ground? [10]

- 26 a The formula $c^2 = a^2 + b^2$ is used in finding one side of a right triangle when the other two sides are given. If $c = 13$ and $a = 5$, find b . [5]

- b A storekeeper can find his profits for the year by subtracting the sum of the cost of the goods and other expenses from the total sales. Write a formula that may be used in finding the profits, indicating the meaning of each letter used in the formula. [5]

- 27 A power plant requires its engineer to keep a record showing the steam pressure for each hour of the day. During a part of one day the record was as follows:

6 a. m.	8 a. m.	10 a. m.	12 m.	2 p. m.
30 lb	140 lb	160 lb	120 lb	140 lb

- a Plot a broken-line graph showing this record. [8]

- b Explain the probable cause for the rise in pressure from 6 a. m. to 10 a. m. and for the drop in pressure at the noon hour. [1, 1]

The following question is based on one of the optional topics in the syllabus and may be substituted for any other question in part II.

- 28 The area of a rectangular plot of ground is 640 square feet. If the length is 24 feet more than the width, find the length and the width of the plot. [6, 4]