

The University of the State of New York

248TH HIGH SCHOOL EXAMINATION

**ELEMENTARY ALGEBRA**

Monday, June 16, 1930 — 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, June 16, 1930

Fill in the following lines:

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

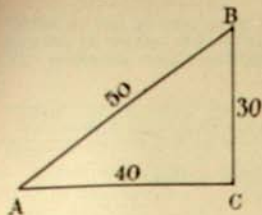
**Detach this sheet and hand it in at the close of the one and one half hour period.**

## 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 Multiply $x^2 - 2x + 4$ by $x + 2$  | Ans..... |
| 2 Divide $x^3 + 2x^2 - 2x - 12$ by $x^2 + 4x + 6$   | Ans..... |
| 3 Combine into a single fraction: $\frac{3}{x^2 - 2x} + \frac{2}{2 - x}$  | Ans..... |
| 4 What are the three factors of $4a^3 - ab^2$ ?   | Ans..... |
| 5 Solve the following equation for $m$ :<br>$8m - 3(2m - 5) = 23$   | Ans..... |
| 6 Solve the following equation for $x$ in terms of $a$ and $b$ :<br>$ax - b = bx$   | Ans..... |
| 7 Two numbers are in the ratio 7:2 and their difference is 30; what is the larger number?   | Ans..... |
| 8 In the formula $L = 2\pi ra$ , find $L$ if $\pi = \frac{22}{7}$ , $r = 14$ and $a = 3$  | Ans..... |
| 9 Solve the following equation for $d$ : $\frac{4d}{5} - \frac{2d}{3} = 4$  | Ans..... |
| 10 Solve the following set of equations for $x$ :<br>$4x - y = 10$<br>$2x + 3y = 12$  | Ans..... |
| 11 Express as a single term $5\sqrt{8} - 3\sqrt{18}$  | Ans..... |
| 12 Find $\sqrt{42}$ to the nearest tenth.   | Ans..... |
| 13 In the formula $h = \frac{3V}{B}$ , express $B$ in terms of $V$ and $h$ .  | Ans..... |
| 14 How many cents in the sum of $x$ half dollars, $2x$ nickels and 7 cents?   | Ans..... |
| 15 If $x = 12 - 2y$ and $y$ is positive, does $x$ increase or decrease as $y$ increases?  | Ans..... |
| 16 Is the graph of $y = 3x^2$ a straight line, a broken line or a curved line?  | Ans..... |
| 17 The length of a rectangle exceeds twice its width by 5. If $x$ represents the width, express in terms of $x$ the perimeter of the rectangle. | Ans..... |
| 18 The sine of an acute angle is .6636. Find the angle to the nearest degree.   | Ans..... |

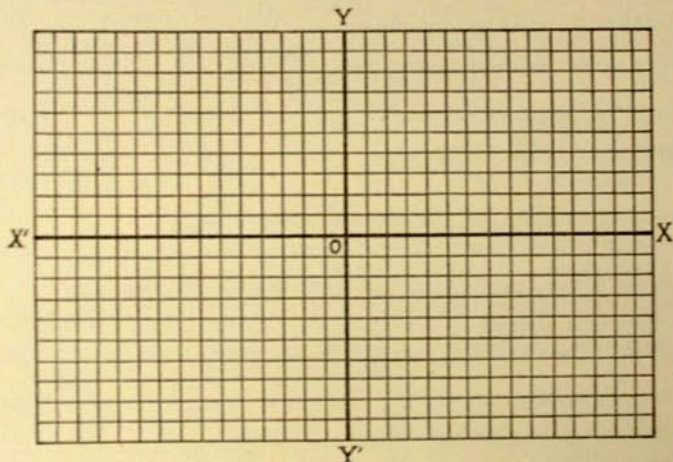
19 In the right triangle  $ABC$ , what is the value of tangent  $A$  expressed as a decimal?



Ans.....

20 On the diagram below, locate the point  $x = 4, y = 2$  and the point  $x = -5, y = 5$ . Draw the straight line joining these points. What is the  $y$ -value of that point on this line for which the  $x$ -value is 1?

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 part of \$25,000 was placed at interest at 4% and the remainder at 7%. The total interest received at the end of the year was \$1,450. How much money was placed at interest at 4%? [8, 2]
- 22 The denominator of a fraction is 7 more than the numerator. If 1 is subtracted from the numerator, the value of the fraction becomes  $\frac{1}{3}$ . Find the original fraction. [8, 2]
- 23 How many pounds of 50-cent coffee must be mixed with 100 pounds of 35-cent coffee to make a mixture worth 42 cents a pound? [8, 2]
- 24 Two towns, M and N, are 200 miles apart. A truck leaves M for N at the same time that an automobile leaves N for M. The truck averages 16 miles an hour, the automobile 24 miles an hour. How far from M will they meet? [8, 2]

25 Indicate whether *each* of the following is true or false: [Write the letters *a* to *e* in a column and then write the word *true* or *false* after each letter.]

- a A root of the equation  $x^2 - 3x + 9 = 0$  is  $-2$ . [2]
- b If  $y = 3 + \frac{2}{x}$  and  $x$  is positive and increasing, then  $y$  is decreasing. [2]
- c If  $D$  is the dividend,  $d$  the divisor,  $Q$  the quotient and  $R$  the remainder, then  $D = d \times Q + R$  [2]
- d  $\frac{ax+b}{a} = x + b$  for all values of the letters. [2]
- e If  $2n + b$  is an odd integer, then  $2n + b + 4$  is an odd integer. [2]
- 26 a A gasoline dealer is allowed a profit of 2 cents a gallon for every gallon he sells. If he sells more than 25,000 gallons in a year he is given an additional profit of 1 cent for every gallon over that number. Assuming that he always sells more than 25,000 gallons a year, express as a formula the number of dollars ( $D$ ) in his yearly income in terms of the number ( $N$ ) of gallons sold. [6]

b The following pairs of numbers represent points on a straight line:

$y$	6	9	18	21	33	60	300
$x$	4	6	12	14	22	?	?

What numbers should take the place of the question marks? [2]

Copy and complete the following, using information given in the table:  $x = ( ) y$  [2]

- 27 The following table shows the average weights of boys and girls between the ages 10 and 14 years inclusive:

Age (in years)	10	11	12	13	14
Boys (weight in pounds)	63	68	74	80	90
Girls (weight in pounds)	60	66	74	84	94

- a Draw a solid-line graph to represent the weights of boys and on the same axes a dotted-line graph to represent the weights of girls. Plot ages horizontally, beginning with age 10 years, and plot weights vertically, beginning with weight 50 pounds. Use a wavy base line to indicate that values from 0 to 50 on the vertical axis have been omitted. [8]

b From the graph made in answer to a, determine how much later the normal boy reaches the weight of 80 pounds than the normal girl. [2]

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 A rectangle is 6 feet long and 4 feet wide. By adding the same amount to the length and the width, the area is increased by 39 square feet. What are the new dimensions? [10]