

The University of the State of New York

256TH HIGH SCHOOL EXAMINATION

INTERMEDIATE ALGEBRA

Thursday, January 26, 1933 — 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 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.

INTERMEDIATE ALGEBRA

Thursday, January 26, 1933

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 Find the value of the discriminant of the equation $2x^2 - 3x - 4 = 0$ Ans.....
- 2 Factor $1 - 0.0016a^4$ Ans.....
- 3 Find the value of $a^{-\frac{1}{2}} \div 3a^0$, when $a = 27$ Ans.....
- 4 Find the value of x if $2^x = \frac{1}{8^{\frac{1}{4}}}$ Ans.....
- 5 Write in the form $x^2 + px + q = 0$, the quadratic equation whose roots are $4 + \sqrt{2}$ and $4 - \sqrt{2}$ Ans.....
- 6 Find the value of $\frac{1}{a} + \frac{1}{b}$ in terms of m if $m = \frac{ab}{a+b}$ Ans.....
- 7 When a book is borrowed, a circulating library charges n cents for the first week and 2 cents for each additional day. Write a formula for the number of cents (c) it would cost to borrow a book for d days, d being greater than 7. Ans.....
- 8 The following pairs of numbers represent points on a straight line:

x	0	1	2	3	4	5
y	1	3	5	7	9	11

 Express y in terms of x ; that is, write the equation of the straight line. Ans.....
- 9 Rationalize the denominator of the fraction $\frac{7}{3 + \sqrt{2}}$ Ans.....
- 10 Is $2 + \sqrt{3}$ a root of the equation $x^2 - 4x + 1 = 0$? [Answer Yes or No.] Ans.....
- 11 Find the value of $\log x^3$ if $\log x^2 = 1.7802$ Ans.....
- 12 Solve the following equation for m :

$$2\sqrt{m+5} = \frac{5m-2}{\sqrt{m+5}}$$
Ans.....
- 13 Find the sum of the infinitely decreasing series $2, 1, \frac{1}{2}, \frac{1}{4}, \dots$ Ans.....
- 14 How many terms are there in the expansion $(a + b)^{15}$? Ans.....
- 15 Find the height of a tree correct to the nearest foot, if the length of its shadow is 60 feet when the sun's elevation is 36° . Ans.....
- 16 Find the arithmetic mean between the sum of the roots and the product of the roots of the equation $x^2 - 4x + 2 = 0$ Ans.....
- 17 A and B can complete a piece of work in 3 days. A can do it alone in 4 days. How many days would it take B to do the work alone? Ans.....
- 18 Find to the nearest degree the acute angle A if $\log \sin A = 9.6432 - 10$ Ans.....
- 19 Write an equation of the first degree, the graph of which passes through the origin. Ans.....
- 20 Write the equation of the straight line whose y-intercept is 3 and whose slope is $\frac{1}{2}$. Ans.....

INTERMEDIATE ALGEBRA

Thursday, January 22, 1931

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 (1) elementary algebra, (2) intermediate algebra.

The minimum time requirement is five recitations a week for half a school year, or the equivalent, after the completion of elementary algebra.

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.

In the examination in intermediate algebra the use of the slide rule will be allowed for checking, provided all computations with tables are shown on the answer paper.

21 The numerator and denominator of a fraction are in the ratio 7:8; if 10 is added to each, they are then in the ratio 9:10. Find the fraction. [7, 3]

22 A man invested \$11,700 in two enterprises. At the end of the first year he found that he had gained 6% on one of the sums invested and lost 4% on the other. His net profit for the year was \$282. How much did he invest in each enterprise? [7, 3]

23 Find the value of $\frac{\sqrt[3]{594 \times .8614}}{2.23^3}$ [10]

24 Solve for x correct to the nearest hundredth:

$$3x^2 - 5x - 4 = 0 \quad [10]$$

25 Emily saves 25 cents the first week and 5 cents more each week than she did the preceding week; in how many weeks will she have saved a total sum of \$14.50? [10] [Solve as a progression.]

26 A car left a town and traveled at a uniform rate. One hour later a second car set out from the same place at a rate 5 miles an hour greater and overtook the first car after traveling 100 miles. Find the rate of the first car. [6, 4]

27 Solve the following set of equations for x and y , correctly group your answers and check one set:

$$\begin{aligned} 5x^2 - 3xy &= 14 \\ 4x - y &= 7 \end{aligned} \quad [6, 2, 2]$$

28 How many quarts of maple syrup 45% pure must be mixed with 10 quarts 25% pure to make a syrup that will be 40% pure? [7, 3]

29 a Plot the graph of $y = x^2 - 2x - 1$ from $x = -2$ to $x = 4$ inclusive. [7]

b From the graph made in answer to a, estimate the roots of $x^2 - 2x - 1 = 0$ and indicate the position of these roots on the graph. [3]

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