

The University of the State of New York

244TH HIGH SCHOOL EXAMINATION

ELEMENTARY ALGEBRA

Monday, January 21, 1929 — 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.

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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 What algebraic expression must be added to $3x^2 - 5x + 6$ to make the result 0? Ans.....

2 Write the expression $a^2 - 7b + 9$ in an equivalent form in which the last two terms are inclosed in a parenthesis preceded by a minus sign. Ans.....

3 In the formula $V = \frac{1}{3}hb$, find V when $h = 10$ and $b = 28$. Ans.....

4 In the formula $h = \frac{v}{lw}$, express l in terms of v , w and h . Ans.....

5 A dealer sold n automobile tires at s dollars each and thereby gained r dollars; what was the cost of one tire? Ans.....

6 Factor $12a^2 - 27b^2$ Ans.....

7 If $x = 3y + 2$, express x^2 as a trinomial in y . Ans.....

8 Solve for x : Ans.....

$$\frac{7x}{12} - \frac{1}{4} = 2x - \frac{5}{3}$$

9 In the following set of equations find the value of a in terms of c and d : Ans.....

$$\begin{aligned} 2a - b &= c \\ a + 3b &= d \end{aligned}$$

10 Simplify $\sqrt{3a^2} \times \sqrt{18b^2}$ Ans.....

11 In the equation $x^2 + 2x - 15 = 0$, which of the two numbers -3 and -5 is a root; that is, which number satisfies the equation? Ans.....

12 Solve for x : Ans.....

$$2x^2 + 5x = 3$$

13 If the area of a square is 14, find a side correct to the nearest tenth. Ans.....

14 If $4:y = 8:10$, find y . Ans.....

15 If $y = -12x$ and x is positive, does y increase or decrease as x increases? Ans.....

16 What number added to 6% of itself equals 31.8? Ans.....

17 Using $-20m$ as the second term, write a trinomial that is a perfect square. Ans.....

18 Which of the following pairs of values for x and y satisfies the equation $2x - y = 6$? Ans.....

$$x = 4, y = -2$$

$$x = 4, y = 2$$

$$x = 2, y = 2$$

$$x = 0, y = 6$$

19 An airplane starting from Albany flies a distance d miles in 3 hours. It takes a second plane 2 hours longer to fly the same distance. Write an equation stating that the difference between the rates of the two planes is 25 miles an hour. Ans.....

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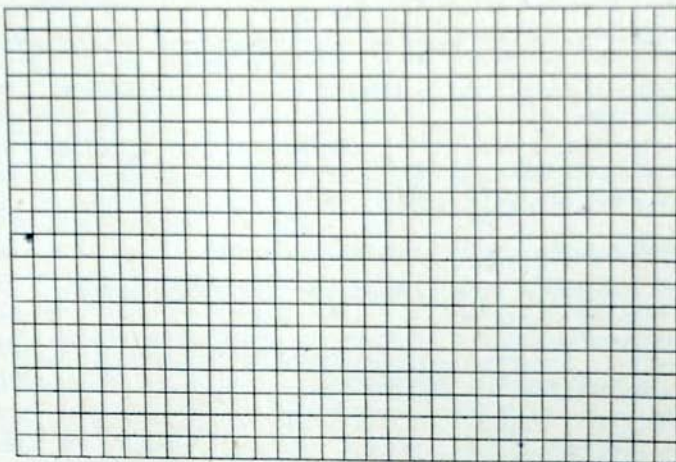
20 The temperature readings at a government station on a certain winter afternoon were as follows:

$$2 \text{ p. m.} \dots\dots + 10^{\circ}$$

$$4 \text{ p. m.} \dots\dots + 14^{\circ}$$

$$6 \text{ p. m.} \dots\dots + 8^{\circ}$$

Represent this information on the diagram by points. Use the second line from the bottom as the horizontal axis, and plot time on this axis; use the second line from the left as the vertical axis, and plot temperature on this axis.



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- Write at top of first page of answer paper to part II (i) name of school where you have studied.
 (ii) 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 for x :

$$\frac{x-x}{nx} - \frac{n}{ix} = -\frac{1}{x} \quad [10]$$

- 22 A father is now 24 years older than his son; in 8 years the father will be twice as old as the son. Find the present age of each. [6, 4]

- 23 The distance between two villages, L and M, is 8 miles less than the distance from M to a third village S. One half the distance between M and S is 6 miles less than the distance between L and M. Find the number of miles from L to M. [7, 3]

- 24 Four times the square of a certain positive number exceeds 8 times the number by 12. Form the equation, solve and check. [5, 3, 2]

- 25 a Write a formula for the following rule:

To find the approximate number of bushels (n) in a bin, multiply the length (l) by the width (w) by the height (h), each expressed in feet, and divide this product by 1.25. [6]

- b In the formula $i = prt$, used in computing simple interest, i represents the interest, p the principal, r the rate and t the time in years. Using this formula, compute the interest on \$600 for 2 years at 5%. [4]

- 26 Indicate whether each of the following statements is true or false: [Write the letters a, b, c, d, e in a column and then write the word true or false after each letter.]

- a One root of the equation $x^2 - 5x + 6 = 0$ is 3. [2]

b $\frac{-6}{2+x} = \frac{6}{2-x}$ [2]

c $\frac{a-b}{a+b} \times \frac{a^2-b^2}{a^2-2ab+b^2} = 1$ [2]

- d If a and b are positive integers, the square of their sum is greater than the sum of their squares plus their product. [2]

- e In the formula $A = \pi r^2$, if r is doubled, then A is doubled. [2]

- 27 Copy and complete each of the following statements:

- a In clearing a fractional equation of fractions we each member of the equation by the least common denominator. [2]

b $\frac{3m^2 - 7mr - 6r^2}{m - 3r} = \dots\dots$ [2]

- c In the equation $ax + b^2 = bx + a^2$, $x = \dots\dots$ [2]

- d If the width of a rectangular field is 8 rods less than its length (l), its perimeter in terms of l is rods. [2]

- e In the set of equations $x^2 + y^2 = 13$ and $x + y = 5$, there are pairs of values for x and y that satisfy the equations. [2]

- 28 $A = s^2$ is the formula for the area of a square.

- a Make a table showing the values of A when s equals 1, 2, 3, 4. [3]

- b Plot a graph showing these relations. [5]

- c Is the graph a broken line or a curved line? [2]