The University of the State of New York

MATHEMATICS (Preliminary)

Wednesday, June 16, 1943 — 9.15 a. m. to 12.15 p. m., only

Fill in the following lines:

Name of school..Name of pupil..

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 on the line 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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Part I

Answer all questions in this part. Write the answer to each question on the dotted line at the right. Each question has 2 credits assigned to it; no partial credit will be allowed. Each answer must be reduced to its simplest form.

1 From 34682 subtract 15827

2 Add 3.6; 14.2; 7.05; 10

3 Multiply 48 by 1.25

4 Find the sum of $3\frac{1}{4}$; $2\frac{1}{3}$; $\frac{1}{2}$

5 Divide $7\frac{7}{8}$ by $3\frac{1}{2}$

6 $2\frac{1}{2} \times \frac{2}{3}$

7 Write 5% as a decimal.

8 What is the length of one side of a square that has an area of 64 square feet?

9 How much tax must be paid on property assessed for $4500, if the tax rate is $18 per $1000?

10 Which of the following fractions is the smallest: $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{8}$, $\frac{1}{4}$?

11 What is the ratio of 8 to 12?

12 A boy spent $2, which was 25% of his money. How much did he have before he spent the two dollars?

13 How many board feet are there in a board 12 feet long, 6 inches wide and 1 inch thick?

14 A grocer paid $1.20 for a bushel of potatoes and sold them for 40 cents a peck. What was the amount of his profit?

15 If a manufacturer pays an excise tax of $2 on a $20 article, what rate of excise tax does he pay?

16 What is the written or printed document that contains the terms of an insurance contract called?

17 Find the value of x in the proportion $4:8 = x:2$

18 A boy traveled 17 miles on his bicycle in 2 hours. At the same rate, how long will it take him to travel 51 miles?

19 What will be the yearly interest on $160, if the interest rate is $4\frac{1}{2}$%?

20 In a class of 30 pupils, 27 of them purchase war stamps. What per cent of the class purchases stamps?

21 A boy had m marbles. He gave his brother half of them. How many did he give to his brother?

22 What is the longest side of a right-angle triangle called?

23 What is the perimeter of a room 18 feet long and 12 feet wide?

24 If Henry has x dollars and his brother Fred has three times as much, express algebraically how many dollars Fred has.

25 A victory tax is now deducted from all pay checks at the rate of 5% on all earnings over $12 a week. How much victory tax must be deducted weekly from a salary of $32 a week?

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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*) grade of work completed in mathematics.

The minimum requirement is the completion of the work of the eighth grade in mathematics.

Part II

Answer any five questions from this part. No credit will be allowed unless all necessary operations are given. Reduce each result to its simplest form and mark each answer *Ans*.

26 From a certain community 225 men entered the armed forces. The people of the community decided they would buy enough additional war bonds to provide each man with the following articles: a steel helmet at $2.50; a gas mask at $9; a mess kit at $2; a blanket at $6.50.

    a How much did the articles for one man cost?   [2]

    b What was the total cost of the articles for the 225 men in the armed forces?   [2]

    c How many citizens of that community would each have to buy an $18.75 bond to provide the men with these articles?   [4]

    d What will be the total maturity value of these bonds?   [2]

27 In a certain school the percentages of the total amount of scrap metal collected in the first five grades of a school were as follows:

    Grade 1 — 12 %

    Grade 2 — 20 %

    Grade 3 — 18 %

    Grade 4 — $33\frac{1}{3}$%

    Grade 5 — $16\frac{2}{3}$%

Using a compass and a protractor, make a circle graph to represent the facts given above.   [10]

28 Mr Smith owns a house valued at $10,000. It is assessed at 80% of its value. The town and county tax, based upon the assessed valuation, is $30 per $1000. The school tax, also based upon the assessed valuation, is $18 per $1000. Mr Smith pays fire insurance on the full value at the rate of $7.80 per $1000 and bomb insurance on the full value at the rate of $1 per $1000.

    a What is the assessed valuation of Mr Smith's house?   [2]

    b How much does Mr Smith pay in taxes?   [3]

    c How much does he pay for insurance?   [3]

    d What is the total amount paid for taxes and insurance?   [2]

29 John Doe sold Mary Roe the following goods, June 15, 1943, and Mrs Roe paid the bill this morning: 2 dozen oranges at 40¢ per dozen; $1\frac{1}{2}$ dozen eggs at 50¢ per dozen; 2 boxes of cereal at 12¢ per box; $\frac{1}{4}$ lb. of butter at 56¢ per lb. and 3 cans of soup at 15¢ per can.

    a What is the total amount of the bill?   [4]

    b Make out a bill such as Mr Doe might have sent to Mrs Roe.   [5]

    c Receipt the bill.   [1]

30 Over a driveway 120 feet long and 9 feet wide, a layer of crushed rock was spread to an average depth of 6 inches.

    a Find the number of cubic yards of crushed rock required.   [7]

    b Find the cost of the crushed rock at $2.50 a cubic yard.   [3]

31 A man purchased a house for $5000. He had it painted and paid the painter $10 a day for 15 days. Some carpentry work was needed, so he hired a carpenter at $12 a day for 5 days. Additional expenses amounted to $37. When he finished his repairs, he sold the house for $5900.

    a How much did he pay for labor and expenses?   [5]

    b What was his profit or loss in the deal?   [5]

[3]

32 *a* Solve the following equations:

(1) $4x - 2x = 6$ [2]

(2) $\frac{x}{3} = 2$ [2]

b Write the algebraic equation for *each* of the following:

(1) If 4 is added to a certain number the sum is 6. [2]

(2) Five times a number equals 15. [2]

c Simplify by collecting terms: [2]

$4m + 3n + m + 2n + 3m$

33 From the figure, which is a circle with the center O, determine the following: [10]

a The length of the diameter

b The circumference of the circle in inches

c The area of the circle

d The number of degrees in arc AB

e The name of the line OD

[4]