MATHEMATICS (Preliminary)—JANUARY 1956 (1)

Part I

Answer all questions in this part. Write the answer to each question on the line at the right. Each question counts 2 credits; no partial credit is allowed. Reduce each answer to its simplest form.

1. Add: \$209, \$8.75, \$.59, \$89, \$76.98
2. Subtract $28\frac{3}{4}$ from 50
3. Multiply 867 by 503
4. Divide 15 by $\frac{5}{8}$
5. Add: $12\frac{5}{8}$, $9\frac{3}{4}$, $8\frac{7}{16}$
6. Divide 124 by .05
7. Change $\frac{4}{15}$ to a decimal correct to the *nearest hundredth.*
8. A steak weighed 2 pounds, 4 ounces. How much did it cost at \$.92 per pound?
9. During his summer vacation a boy earned \$4.50 per day and saved 60% of his earnings. If he worked 45 days, how much did he save during the vacation?
10. From his coin bank a boy took 3 half dollars, 8 quarters, 7 dimes, 6 nickels and 9 pennies to deposit in his school savings account. Express in dollars and cents the total amount of money he deposited.
11. If a roast that requires 1 hour and 40 minutes of roasting time has been in the oven for 55 minutes, how many more minutes of roasting time are required?
12. On the first day of its drive a junior high school raised \$40, which was $33\frac{1}{3}\%$ of its Junior Red Cross quota. How much was the quota?
13. On a certain map a distance of 10 miles is represented by $\frac{1}{2}$ inch. If two towns are $3\frac{1}{2}$ inches apart on this map, express in miles the actual distance between the two towns.
14. At an annual rate of \$.40 per \$100, what is the fire insurance premium for one year on a house that is insured for \$8000?
15. A meter equals approximately 1.09 yds. How much longer, in *yards,* is a 100-meter dash than a 100-yard dash?
16. A train leaves New York City at 8:10 a.m. and arrives in Buffalo at 4:45 p.m. on the same day. How long, in hours and minutes, does it take the train to make the trip?
17. A jacket that was marked at \$12.50 was sold for \$10. What was the rate of discount on the marked price?

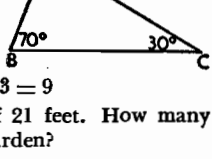
18. **In the formula** $S = 6e^2$, find the value of S when $e = 5$.

19. **The area** of a rectangular room is 1000 square feet. If the width **of this room is** 25 feet, what is the length of the room in feet?

20. **Find** the simple interest on $600 for one year at a yearly rate of **3½%.**

21. **If** n represents a certain number, express in terms of n a number **that** is 4 more than 5 times n.

22. How many degrees are there in angle A of the triangle at the right?



23. Find the value of x in the equation: $2x + 3 = 9$

24. A circular flower garden has a diameter of 21 feet. How many feet of fencing will be required to enclose this garden?

25. If a car averages 18 miles to a gallon of gasoline, how many gallons of gasoline will be used on a trip of 369 miles?

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. In a small community the town tax rate during a recent year was $27.80 per $1000 of the assessed valuation. The school tax rate was $20.30 per $1000 of the assessed valuation. A man's house, valued at $15,000, was assessed for 30% of its value.

a. What is the assessed valuation of the house? [3]

b. What was the total amount the man paid that year in town and school taxes? [7]

27. A girl works in a dress shop where her salary is $25 a week. In addition, she receives a commission of 4% on all sales she makes each week over $250. Her sales for one week amounted to $635 and for the next week, $850. What were her total earnings for this two-week period? [10]

28. A boy had some hens as a project in his 4-H club. The expenses of caring for the hens, including food, averaged $4.20 a week. He collected an average of 24 eggs per day.

a. Find the cost of caring for the hens for 18 weeks. [3]

b. If the boy sold the eggs at an average price of $.50 a dozen, find his total profit during the 18-week period. [7]

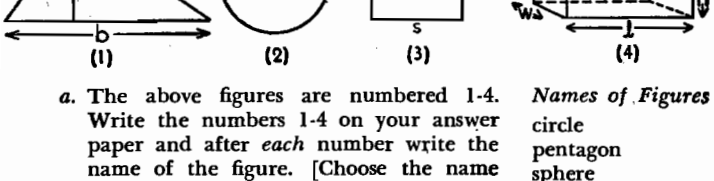
29. A farmer harvested potatoes from a rectangular field that was 32 rods long and 45 rods wide. This field produced an average of 360 bushels to the acre, and the potatoes were sold for $1.20 a bushel.

a. How many acres were there in this field? [Use 160 sq. rd. = 1 acre.] [5]

b. How much did the farmer receive for the potatoes harvested from this field? [3]

c. What was the average income *per acre* from this field? [2]

30. Referring to the figures below, answer parts *a* and *b*.



(1) (2) (3) (4)

a. The above figures are numbered 1-4. Write the numbers 1-4 on your answer paper and after *each* number write the name of the figure. [Choose the name from the list at the right.] [4]

Names of Figures
circle
pentagon
sphere
rectangular prism
triangle
cone
square

b. Write the formula needed to find the
(1) area of figure 2 [2]
(2) perimeter of figure 3 [2]
(3) volume of figure 4 [2]

31. Because of illness a man was unable to work for 35 weeks. During this time he was in a hospital for 6 weeks. The health insurance policy for which he had paid an annual premium of $49.50 guaranteed him $25 a week while he was not able to work, and an additional $12.50 a week while he was in the hospital.

a. How much did he receive from the insurance company for his illness? [6]

b. If this was the first benefit he received from the company during the seven years he had carried the insurance, how

much more did he receive from the company that year than he had paid in premiums for the seven-year period? [4]

32. In a homeroom with a total enrollment of 28 pupils, there were 4 more boys than girls. If n represents the number of girls in this homeroom, then

a. express in terms of n the number of boys in the homeroom [1]

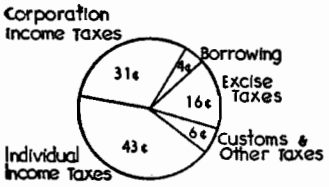
b. express in terms of n the total number of pupils in the homeroom [2]

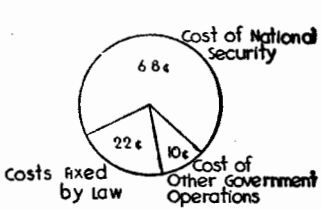
c. write an equation necessary to find the value of n [4]

d. solve this equation for n [2]

e. find the number of boys in this homeroom [1]

33. The graphs below were published by the federal government to show where the tax dollar comes from and where it goes.





Use the graphs above to answer the following questions:

a. What per cent of the federal tax dollar was spent on national security? [1]

b. What per cent *more* money was obtained from individual income taxes than from corporation income taxes? [2]

c. How many dollars, of every million dollars collected in taxes, were obtained from excise taxes? [3]

d. List the *four* sources of income whose total approximately equals the amount spent for national security. [4]