MATHEMATICS (Preliminary)—JUNE 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: \$429.75, \$653, \$28.59, \$75, \$207.86.

2. Subtract $3\frac{3}{8}$ from $7\frac{1}{2}$.

3. Divide 3.105 by 1.5.

4. Perform the indicated operations: $\frac{240 \times 124}{160}$.

5. Divide 15 by $1\frac{3}{4}$.

6. Find the cost of $1\frac{3}{4}$ yards of plastic slipcover material at \$1.60 per yard.

7. Which value is the smallest: $\frac{2}{5}$, $\frac{3}{8}$%, .5?

8. A man had a piece of lumber 9 feet 8 inches long that he wished to cut into four equal lengths. How long would *each* piece be, if he made no allowance for loss in cutting?

9. The eighth grade homerooms in a junior-senior high school raised \$46 of the school's \$200 contribution to the Junior Red Cross. What per cent of the contribution was raised by these homerooms?

10. How many square yards of carpeting are needed to cover a floor from wall to wall if the floor is 18 feet long and 15 feet wide?

11. In terms of n, represent the number of days in n weeks.

12. A boy's quarterly test marks were: 67, 74, 86, 89. What was the average of his test marks?

13. A salesman received a salary of \$55 a week plus 3% on his total weekly sales. During one week his total sales amounted to \$1800. How much in all did he earn that week?

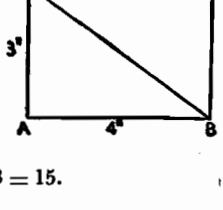
14. The tax rate, in decimal form, for a certain community was .029 of the assessed valuation. Express this tax rate in dollars per \$1000 of the assessed valuation.

15. Members of a family saved 10% of their monthly income. If they saved \$47.50 each month, what was their monthly income?

16. A recipe calls for $1\frac{1}{2}$ cups of sugar. It is necessary to make eight times the recipe for a church supper. If 2 cups of sugar equals one pound, how many pounds of sugar will be needed to make the recipe for the supper?

17. A man borrowed \$800 and agreed to pay 4% yearly interest. If he repaid the loan at the end of 6 months, how much interest did he pay?

18. Find the length in inches of diagonal *DB* in the rectangle at the right.



19. Find the value of x in the equation $\frac{x}{2} + 3 = 15$.

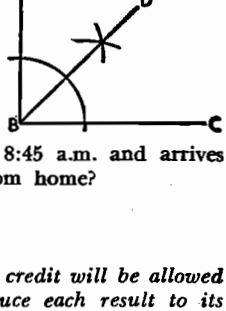
20. The relationship between a photograph and its enlargement is an example of which of the following ideas: congruence, similarity, equality?

21. A circle has a radius of $4\frac{1}{2}$ inches. Find the length of its diameter in inches.

22. Find the value of $4a + 3b$ if $a = 5$ and $b = 2$.

23. On a map, 1 inch represents 500 miles. How many miles apart are two places that are $1\frac{1}{2}$ inches apart on the map?

24. In the diagram at the right, angle *ABC* is a right angle with a construction shown. How many degrees are there in angle *DBC*?



25. Mary usually leaves home for school at 8:45 a.m. and arrives home at 3:15 p.m. How long is she away from home?

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. A man has \$275.80 in his checking account on May 1. During the month he made the following deposits: \$126.50, \$86, \$97.50, \$54.30.

He drew checks during the same month for \$89.50, \$56.20, \$14.26, \$60, \$8.75. The bank deducted from his account a charge of 10 cents for each check drawn. What was his bank balance on June 1? [10]

27. There are 36 members in a boys' club. Each member paid \$1.50 in dues for the year. The money collected was spent as follows: 40% toward a camping trip, 25% for a party, and the remainder for a picnic.

a. How much money did this club collect in dues? [3]
b. What amount was spent by the club on the camping trip? [2]
c. How much money was spent by this club for the party? [2]
d. What amount remained for the picnic? [3]

28. To pay the yearly expenses connected with his summer cottage, a man decided to rent it for part of the summer. He estimated the yearly expenses as follows: taxes, \$102; 4½% interest on the mortgage of \$4200; insurance, \$34; other expenses, \$50.

a. Find the total yearly expenses of his cottage. [7]
b. If he rented the cottage for \$75 a week, in how many weeks would the rental *exactly* meet the amount of the yearly expenses? [3]

29. The power tools that a man wanted for his home workshop were listed at \$180. He bought them at a sale at a 15% discount.

a. Find the net cost of the tools. [5]
b. If he paid a 2% sales tax on the net cost of the tools, what was the total amount of his bill? [5]

30. The total assessed valuation of a house and lot is \$5500. The tax rate for the year is \$40 per \$1000.

a. Find the tax on this property for the year. [4]
b. The tax bill states that the tax may be paid in two equal payments, the first by November 1 and the second by May 1. How much would *each* payment be? [2]
c. The bill also states that, if the whole tax is paid by November 1, a 1% discount on the *second half* of the tax may be deducted. How much will be saved if the entire tax is paid by November 1? [4]

31. *a.* Write the equation showing that, if a number n is increased by 28, the result is 67. [2]
b. Write in simplest form: $7x + 3x - 2x$ [2]
c. Solve and check: $2x - 3 = 27$ [2, 1]

31. Using the formula $V = \frac{lwh}{3}$, find V if $l = 6$, $w = 2$, and $h = 5$. [3]

32. List the numbers 1-5 on your answer paper. After *each* number write the *word or expression* from the parentheses that will make the statement true. [10]

(1) To know how much a tin can will hold, you need to find its (circumference, area, volume).

(2) In triangle ABC, angle A is 70 degrees and angle C is 50 degrees. The largest angle of the triangle is angle (A, B, C).

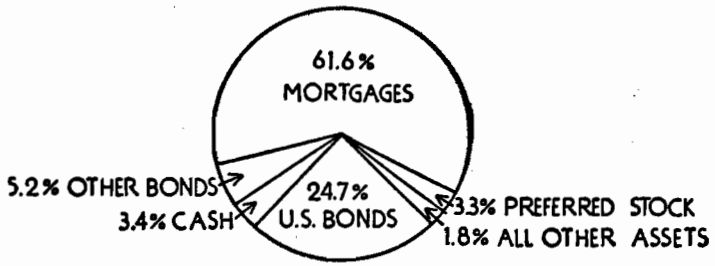
(3) The date on the cornerstone of a building indicates that it was erected in MDCCCXLI. This date is the same as (1841, 1851, 1861).

(4) Each side of angle A is one inch long. If each of its sides is extended until it is two inches long, angle A (becomes larger, becomes smaller, remains the same size).

(5) The answer to $91\frac{3}{4} \times 19\frac{1}{2}$ is approximately (1000, 1800, 2500).

33. A savings bank in a large city published the graph below for its depositors. Use the graph to answer the following questions:

HOW YOUR SAVINGS WORK FOR YOU



a. In what *one* way is approximately one fourth of the bank's assets invested? [2]

b. Which fraction is *nearest* to the bank's total investment in mortgages: $\frac{1}{2}$, $\frac{3}{4}$, $\frac{5}{8}$? [2]

c. The bank's total assets are $162,575,800. Of this total, what amount is kept in cash? [4]

d. Approximately how many times as much money is invested in United States Bonds as in other bonds? [2]