

MATHEMATICS (Preliminary)—JUNE 1954 (1)

Part I

Answer all questions in Part I. 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.

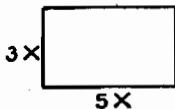
1. Add $10\frac{1}{2}$, $2\frac{1}{3}$, $7\frac{1}{4}$
2. Subtract \$27.95 from \$50
3. Divide $3\frac{1}{2}$ by 2
4. Multiply \$2.04 by 60.5
5. Divide .768 by .32
6. Multiply 69 by $7\frac{1}{3}$
7. A 29-inch length of ribbon contains how many more inches than a $\frac{3}{4}$ -yard length of the same ribbon?
8. A man drove 80 miles in 2 hours and then drove the next 100 miles in 3 hours. How many miles an hour did he average for the 5 hours?

9. What is the length of the piece of cardboard shown in the diagram at the right to the nearest eighth of an inch?



10. What is the simple interest on \$460 for 2 years at $2\frac{1}{2}\%$?
11. How much did a boy earn for selling \$164.50 worth of greeting cards if he was paid 40% commission on his sales?
12. What is the value of $5a^2$ when $a = 3$?
13. Write the equation for the following statement: If 5 times a certain number is divided by 2, the quotient is 15.
14. A merchant sold hardware for \$75, making a profit of \$15. What was the per cent of profit on the selling price?
15. How much money must be invested at 5% interest to earn a yearly income of \$300?
16. Find the value of x in the following equation: $7x - 4 = 115$
17. At \$14.50 per square yard what is the cost of a rug that is 15 feet long and 12 feet wide?

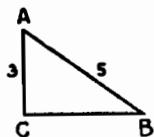
18. Express algebraically the perimeter of the rectangle pictured at the right.



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19. A house is insured against fire for \$10,000 at 32 cents per \$100. What is the premium?

20. If hypotenuse AB in the right triangle pictured is 5 and if side CA is 3, what is the length of side CB ?



21. A girl is making badges in her homemaking class. She can make one badge from $\frac{1}{2}$ yard of ribbon. How many badges can she make from $1\frac{1}{2}$ yards?

Follow these directions in answering questions 22-25: Write on the line at the right of each statement the letter (a, b or c) representing the correct answer.

22. Which one of the following has the smallest value?

- (a) $\frac{1}{3}$ (b) .6 (c) $62\frac{1}{2}\%$

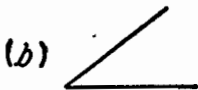
23. Which formula should be used to find the circumference of the circle at the right? (a) $C = \pi r$

- (b) $C = \pi r^2$ (c) $C = 2\pi r$



24. In a junior high school 6 out of every 10 children enrolled participated in after-school activities. What part of the enrollment participated in after-school activities? (a) $\frac{1}{6}$ (b) $\frac{3}{5}$ (c) $\frac{5}{8}$

25. Which one of the angles below is an obtuse angle?



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 boy works in a store $2\frac{1}{2}$ hours each afternoon Monday through Friday, and 8 hours on Saturday. He is paid 80 cents an hour.

- How much does he earn each week? [5]
- If he uses 20% of his weekly earnings for amusements and carfare and 30% for clothes and other necessities and saves the rest, how many dollars does he save each week? [3]

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- c. For how many weeks will he have to save this amount in order to save \$82 for a summer camping trip? [2]

27. A man looked at the gauge (measuring device) on the oil tank in his home on November first. The gauge showed that the tank was $\frac{7}{8}$ full. On December first he checked again and found that the tank was $\frac{1}{2}$ full. The tank holds 280 gallons when full.

- a. How many gallons of oil were used during the month of November? [7]
b. At 13.5 cents per gallon, what was the cost of the oil used during November? [3]

28. A farmer bought a truck for \$2400, borrowing all of the money at 5% interest. He kept the truck for one year. During this time he spent \$84 for insurance on the truck and \$285 for gasoline, oil and repairs. At the end of the year he sold the truck at a 40% loss for depreciation. How much had it cost the farmer to keep and operate the truck? [10]

29. In each of the following problems one necessary fact has been left out. In each case tell what additional fact you need in order to solve the problem.

- a. A man took a trip and drove at an average speed of 35 miles an hour. How many miles did he drive? [2]
b. A woman bought a life-insurance policy at the rate of \$35.52 per \$1000. What premium did she pay the life-insurance company? [2]
c. How many gallons will a rectangular tank hold if it is 75 feet long and 25 feet wide? [1 cu. ft. = $7\frac{1}{2}$ gal.] [2]
d. At \$10.50 a square yard how much will it cost to carpet a living room from wall to wall if the room is 7-yards long? [2]
e. On the first day of a drive to raise money for a scholarship fund, the students of a high school raised 40% of their desired total. How many dollars did they raise on that day? [2]
30. a. On a map having a scale of $\frac{1}{2}$ inch = 15 miles, what is the distance in miles between two towns that are $3\frac{1}{2}$ inches apart on the map? [5]
b. A picture 8 inches long and 6 inches wide is to be enlarged so that its length will be 12 inches. How many inches wide will the enlarged picture be? [5]

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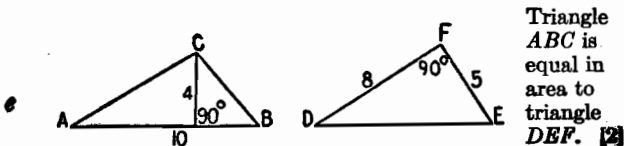
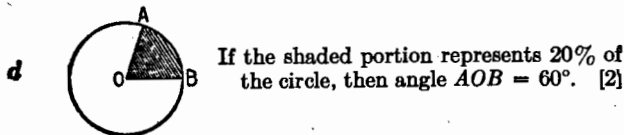
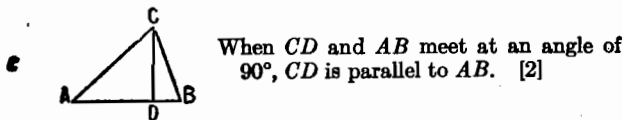
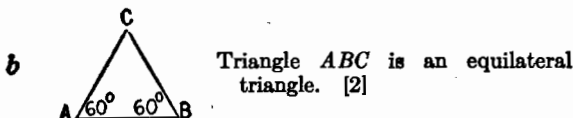
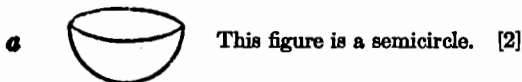
31. a. A sum of money is represented by s dollars. Represent algebraically a sum of money that is

- (1) \$300 more than s [1]
- (2) \$50 less than s [1]
- (3) \$100 more than twice s [1]
- (4) half as much as s [1]

b. Solve and check each of the following equations:

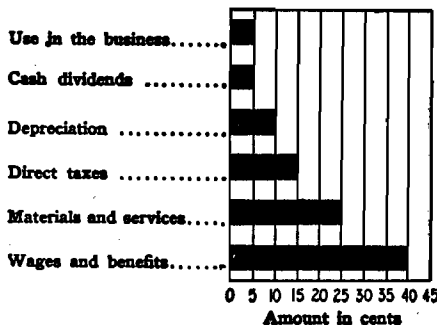
- (1) $5n - 1 = 34$ [2, 1]
- (2) $\frac{1}{2}n = 12$ [2, 1]

32. Beside each of the following diagrams there is a statement about the diagram. List the letters a through e on your answer paper. Opposite each letter write the word *true* if the corresponding statement is true. Write the word *false* if the statement is false.



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33. In a recent year a large industrial concern used each dollar of its sales income as shown in the graph below.



- How many cents of each dollar of sales income did the company use to pay wages and benefits? [1]
- How many more cents out of each sales dollar was spent on wages and benefits than on materials and services? [2]
- What was the total number of cents out of each sales dollar that the company set aside for depreciation and for use in the business? [2]
- The amount the company paid in direct taxes was how many times the amount it paid in cash dividends? [2]
- What per cent of each sales dollar was paid in cash dividends? [3]