MATHEMATICS (8TH GRADE)—JUNE 1959 (1)

Part I

Answer all questions in this part. Write the answer to each question on the line at the right. Questions 1-20 count 2 credits each; no partial credit is allowed. Questions 21-30 count 1 credit each. Reduce each answer to its simplest form.

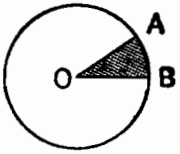
1. Subtract \$94.78 from \$360.50
2. Add: $8\frac{3}{4}$, 12, $15\frac{5}{16}$
3. Divide 16 by $2\frac{2}{3}$
4. Multiply 956 by 507
5. Divide 1.672 by .08
6. Which of the following has the same value as $1\frac{1}{2}\%$: 1.5, .15, .015?
7. A group left on a trip at 8:50 a.m. and reached their destination at 3:30 p.m. How long, in hours and minutes, did the trip take?
8. Find the amount of a 2% tax on a purchase amounting to \$24.50.
9. On a scale drawing, a line $\frac{1}{4}$ inch long represents a length of 1 foot. On the same drawing, what length represents 4 feet?
10. Last year the postage rate for sending 1 ounce of mail first class was increased from 3 cents to 4 cents. What was the percent of increase in the postage rate?
11. If 1 pound 4 ounces of meat costs \$1.05, what is the cost of the meat per pound?
12. What is the interest for 3 months on a loan of \$1,200 at a yearly rate of 5%?
13. How many square yards of linoleum are needed to cover a floor having an area of 270 square feet?
14. A boy took an examination on which there were 20 examples. If he had 18 of them correct, what percent of the examples did he do correctly?
15. Six girls sold the following number of boxes of cookies: 42, 35, 28, 30, 24, 27. What was the average number of boxes sold by each girl?
16. A porch lounge regularly sells for \$29.50. How much money is saved if the lounge is bought at a 20% discount?
17. A man has an \$8,000 life-insurance policy on which he pays a premium of \$21.75 per \$1,000 each year. Find his annual premium.
18. What is the largest number of half-pint bottles which can be filled from a 10-gallon can of milk?
19. What number multiplied by itself equals 144?

20. A boy received 25% commission for selling magazine subscriptions. One week he earned $12. How many dollars worth of magazine subscriptions did he sell that week?

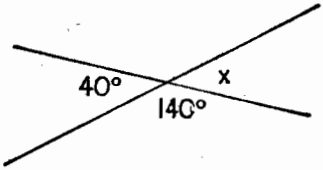
Directions (21-30): Indicate the correct completion for *each* of the following by writing on the line at the right the letter *a*, *b* or *c*.

21. If a diagonal is drawn in a square as shown in the diagram, the two triangles formed are (*a*) equilateral (*b*) right (*c*) acute

22. If the shaded part of the circle in the diagram is 10% of the circle, angle *AOB* contains (*a*) 10° (*b*) 18° (*c*) 36°



23. In the diagram, the angle represented by x contains (*a*) 40° (*b*) 60° (*c*) 140°



24. The number of equal squares which make up the surface of a cube is (*a*) 4 (*b*) 6 (*c*) 8

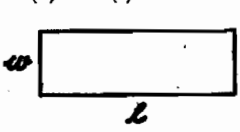
25. An octagon is a polygon having exactly (*a*) 5 sides (*b*) 6 sides (*c*) 8 sides

26. If one-third of a number n is equal to 4, the number is (*a*) 3 times 4 (*b*) 3 less than 4 (*c*) 3 greater than 4

27. The expression $5a + 7 - 2a + 9$ is the same as (*a*) $7a + 16$ (*b*) $3a + 16$ (*c*) $19a$

28. The value of $a^3 + 5$ when $a = 3$ is (*a*) 14 (*b*) 11 (*c*) 64

29. The area of the rectangle at the right may be found by using the formula (*a*) $A = 2l + 2w$ (*b*) $A = 2lw$ (*c*) $A = lw$



30. Linda has b books and Betty has one-fifth as many. The number of books that Betty has may be represented by (*a*) $b - 5$ (*b*) $\frac{b}{5}$ (*c*) $5 - b$

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.

31. On May 1, a man had a bank balance of \$85.35 in his checking account. During May he made deposits of \$240, \$75.50 and \$120. He also wrote checks for \$95, \$11.75, \$180.50, \$67.20 and \$22.50 which were drawn on his account that month. If the bank deducts from his account a service charge of 10 cents for each check drawn, find the bank balance on June 1. [10]

32. A lady wished to purchase a dinette set which was marked \$210. She was told that if she paid cash at the time of purchase, she would receive a 5% discount on the marked price. If she purchased the set on the installment plan, she would be required to make a down payment of 20% of the marked price plus 12 monthly payments of \$16.50 each.

a. If the lady paid cash for the set, how much did it cost her? [4]

b. How much would the set have cost her if she had bought it on the installment plan? [4]

c. How much less did she pay by purchasing the set for cash rather than on the installment plan? [2]

33. A building is insured for \$12,000 at an annual rate of \$.22 per \$100.

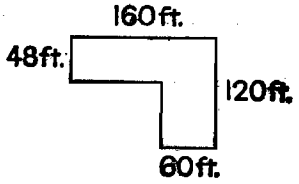
a. Find the annual premium. [3]

b. It is possible to purchase insurance at a 5-year rate which is 4 times the annual rate. Find the 5-year rate per \$100. [2]

c. What would be the total cost of insurance for 5 years at the 5-year rate? [2]

d. How much would be saved in 5 years by taking a 5-year policy instead of five 1-year policies? [3]

34. The diagram at the right represents the section of a man's property which he has graded and seeded. To improve the lawn, he has decided to buy a special type of lawn fertilizer for the entire area.



a. Find the number of square feet in the area of the lawn shown in the diagram. [5]

b. The lawn fertilizer he has selected sells for $2.75 a bag. If 1 bag is needed for every 2,000 square feet of lawn, how much will the fertilizer cost for the entire area? [5]

35. *a.* Find the average of 12.46, 24.08, 9.75, 32.24, 10.85 and 35. [5]

b. Find the value of: $10\frac{1}{2} \times 12 \times 8 \times 42\frac{1}{2}$ [5]

36. Indicate the correct completion for *each* of the following by writing the number 1, 2 or 3 opposite the proper letter on your answer paper. [10]

a. A property common to all triangles is that the
(1) three angles are acute
(2) three sides have different lengths
(3) sum of the angles is 180°

b. The two figures below which are equal in area are (1) figures 1 and 2 (2) figures 2 and 3 (3) figures 1 and 3

Fig. 1

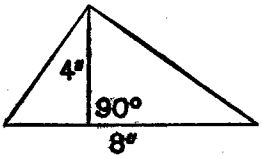


Fig. 2

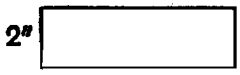
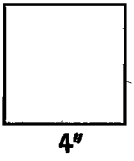
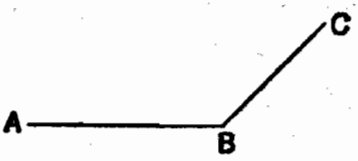


Fig. 3

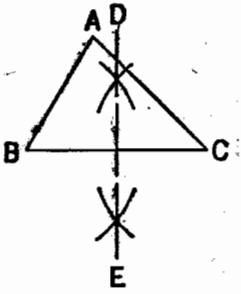


c. If the circumference of a circle is known, the diameter may be found by
(1) multiplying the circumference by π
(2) dividing the circumference by π
(3) adding π to the circumference

d. The best estimate of the number of degrees in angle *ABC* at the right is (1) 50° (2) 90° (3) 150°

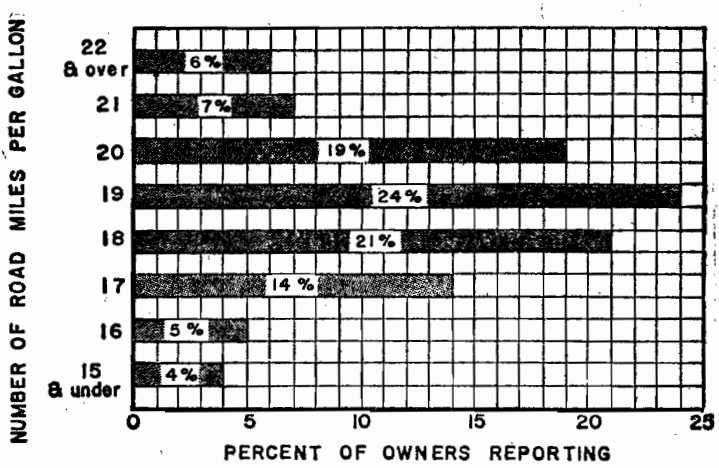


e. The line *DE* which was constructed in the diagram
(1) bisects side *BC*
(2) is perpendicular to side *AC*
(3) bisects angle *C*



37. *a.* Bill is twice as old as Tom. The sum of their ages is 39. Let x represent Tom's age.
(1) Express Bill's age in terms of x. [1]
(2) Write an equation that can be used to find both boys' ages. [2]
(3) Solve the equation to find the value of x. [2]
(4) How old is Bill? [1]

b. Write an equation for *each* of the following statements, letting n represent the unknown number. [*Solution of the equations is not required.*]
(1) A number increased by 4 equals 12. [1]
(2) Four times a number is 20. [1]
(3) A number divided by 4 is equal to 3. [1]
(4) If 4 is subtracted from a number the result is 6. [1]



38. The above graph is based on current reports obtained from 1,000 owners of a new automobile. Base your answers to the questions below on this information and on the graph above:

a. What percent of the owners reported mileage of 19 miles per gallon? [1]

b. How many times as many owners reported 17 miles per gallon as reported 21 miles per gallon? [2]

c. How many owners reported 20 miles per gallon? [2]

d. What is the sum of all the percents indicated in the graph? [2]

e. How many more owners reported mileage of 19 miles per gallon than reported mileage of 20 miles per gallon? [3]