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. Multiply 687 by 409.

2. Divide 40.5 by .15

3. Subtract $15.36 from $20.

4. Find the value of $7\frac{3}{4} + 5\frac{2}{4} - 4\frac{1}{2}$.

5. Find the value of $1\frac{1}{2} \times 2\frac{1}{4} \times \frac{2}{3}$.

6. What is $44 \div 3\frac{1}{7}$?

7. Change $\frac{5}{18}$ to the *nearest whole percent*.

8. On a certain road map 1 inch represents 12 miles. How many miles will a length of $2\frac{1}{4}$ inches represent on this map?

9. A newspaper headline read: "Quarter of a million dollars raised for hospital fund." Write this amount of money in numbers.

10. One day the sun rose at 5:43 a.m. and set at 6:19 p.m. How many hours and minutes were there between sunrise and sunset?

11. A girl made a circle graph to show the distribution of report card marks in mathematics in her grade. She drew an angle of 45° to show the percent of pupils who had a mark of A. What percent of her grade had a mark of A?

12. A man bought an article and gave the clerk a five-dollar bill. The clerk gave this correct change: 2 pennies, 1 nickel, 1 dime, 1 quarter and 2 one-dollar bills. How much did the article cost?

13. What is the simple interest on a loan of $600 at 5% for 3 months?

14. At an annual rate of $.32 per $100, what is the fire insurance premium for 1 year on a house that is insured for $7,500?

15. Write $3\frac{1}{2}\%$ in decimal form.

16. If ice cream costs $2 per gallon and 1 quart is to serve 8 persons, how much will enough ice cream for 96 persons cost?

17. A junior high school established a school savings plan. During the year the eighth grade saved $950. If this was 50% of the total amount saved by the school, find the total amount saved.

18. How many square yards of linoleum are needed to cover a floor having an area of 270 square feet?

19. On a parking meter was printed: "12 minutes for 1¢. Maximum deposit 10¢." How many hours may a driver legally park at one of the meters for 10 cents?

20. If a box of 24 candy bars is bought for 80¢ and the bars are sold at 5¢ each, what is the percent of profit on the cost?
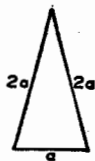
Directions (21-30): Indicate the correct completion for *each* of the following by writing on the line at the right the letter *a*, *b* or *c*.

21. If one number is represented by n, a number 10 less than n would be represented by   (*a*) $10 - n$ (*b*) $\frac{n}{10}$ (*c*) $n - 10$

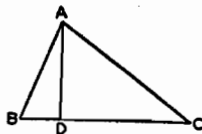22. If $n + 3 = 12$, then the value of n is   (*a*) 15   (*b*) 9   (*c*) 4

23. The value of n^2 when $n = 3$ is   (*a*) 9   (*b*) 6   (*c*) 4

24. The perimeter of the triangle in the diagram is
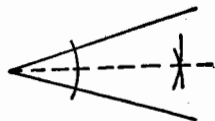(*a*) $4a$ (*b*) $5a^2$ (*c*) $5a$

25. The value of $6x$ when $x = \frac{1}{2}$ is   (*a*) 3   (*b*) $3x$ (*c*) $6\frac{1}{2}$

26. In triangle ABC at the right, line AD is perpendicular to BC. Angle ADC is   (*a*) an obtuse angle   (*b*) an acute angle   (*c*) a right angle

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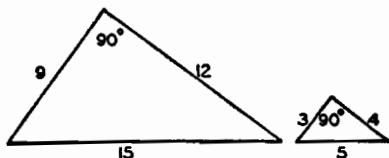(*a*) 4   (*b*) 6   (*c*) 8

28. In the diagram, the dotted line is called a   (*a*) bisector   (*b*) parallel   (*c*) perpendicular

29. The sum of the angles of a triangle is   (*a*) 90°   (*b*) 180°
(*c*) 360°

30. The triangles in the diagram are
   (a) congruent   (b) equal in area   (c) similar

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. The Junior Red Cross sold 1,200 tickets for a fund-raising entertainment. One-third of the tickets were for reserved seats and sold at $.75 each. The remainder of the tickets were for unreserved seats and sold at $.50 each. The expenses were $40.75 for printing and advertising, $90.50 for costumes, $68 for stage equipment, and $26.80 for other expenses. How much profit did the Junior Red Cross make as a result of this entertainment?   [10]

32. Typewriters listed at $160 each are sold to a certain club at a $12\frac{1}{2}\%$ discount. In addition, a 2% discount is allowed on the net price if the club pays cash.
   a. Find the cash price the club would pay for each typewriter.   [7]
   b. Find how much the club would save on each typewriter by taking advantage of both discounts.   [3]

33. A boy built an aquarium with the dimensions shown in the diagram at the right.
   a. Find the volume of the aquarium in cubic inches.   [3]
   b. Find to the *nearest gallon* the amount of water in the aquarium when it is two-thirds full. [231 cubic inches = 1 gallon.]   [7]
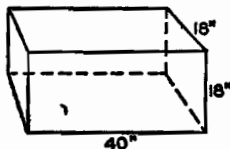
34. In a certain village the school tax was 35 mills per $1, the village tax was $1.42 per $100, and the town tax was $23.60 per $1,000 of assessed valuation. Find the total yearly tax paid on property assessed at $5,000 in that village.   [10]

35. In a large industrial plant, a certain employee's rate of pay is $1.46 per hour for a 40-hour week. For the time worked over 40 hours each week, the hourly rate is $1\frac{1}{2}$ times the regular rate. During one week this employee's time card showed he had worked 8 hours, $9\frac{1}{2}$ hours, $10\frac{1}{2}$ hours, 9 hours, 10 hours, 8 hours. How much did he earn that week? [10]

36. To find the height of a tree on level ground, a boy held a yardstick in a vertical position and found its shadow to be $2\frac{1}{2}$ feet long. At the same time the tree cast a shadow 15 feet long. Draw a diagram and find the height of the tree. [10]

37. *a.* Solve the following problem by the use of a correct algebraic equation: A Girl Scout troop sold cookies to raise money. The first week they sold 20 boxes more than they did the second week. If they sold 180 boxes during the two weeks, how many boxes did they sell each week? [4, 2]

  b. In the formula $c^2 = a^2 + b^2$, find the value of c if $a = 9$ and $b = 12$. [4]

38. The graph below appeared in a recent publication.

Growth in Motor Vehicle Registration Since 1920
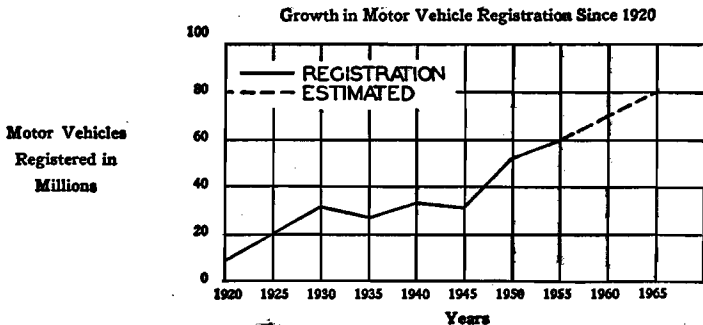
Use the graph to answer the following questions:

  a. Approximately how many motor vehicles were registered in 1955? [2]

  b. Approximately how many times as many motor vehicles were registered in 1955 as in 1925? [3]

  c. According to the estimate made on this graph, how many more motor vehicles will be registered in 1965 than in 1955? [2]

  d. What percent of increase in registration is expected between 1955 and 1965? [3]