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. Add: $8\frac{1}{2}$, $15\frac{1}{2}$, $6\frac{3}{4}$
2. Subtract $7.56 from $20.
3. Multiply 3.14 by 7.2
4. Divide 9.728 by 1.52
5. Divide $3\frac{9}{10}$ by $3\frac{1}{4}$.
6. Last year a large university in the United States had an enrollment of 40,788 students. Round off this number to the *nearest thousand*.
7. Find the square root of 289.
8. Which fraction has the largest value: $\frac{5}{9}, \frac{5}{8}, \frac{5}{11}$?
9. What is the cost of 9 ounces of cheese at 80 cents per pound?
10. A man borrowed $3,600 for 1 month at an annual rate of 5%. How much interest did he owe?
11. One piece of wire is 25 feet 8 inches long and another is 18 feet 10 inches long. What is the difference in length?
12. The selling price of an article was $20. If the cost of the article was $12 and the overhead expense involved was 15% of the selling price, find the profit.
13. In a recent year the enrollment in a first grade was 150 pupils. The following year the enrollment was 180 pupils. What was the percent of increase in enrollment?
14. At 15% commission, how much will a salesman's total sales have to be for him to earn $75?
15. On a road map $\frac{1}{4}$ inch represents 8 miles of actual road distance. How many miles apart are two towns which are represented by points $2\frac{1}{4}$ inches apart on the map?
16. An estimate of the population of the United States was 169,400,000 on December 1, 1957. This is 2,800,000 higher than on December 1, 1956. What was the estimated population on December 1, 1956?
17. In one city the cost of educating each elementary school child is $432 per year. If there are 180 school days in the year, what is the cost for each child for each day of school?
18. How many square yards are there in the area of a rug which is 15 feet long and 12 feet wide?

19. If the school tax rate in a community is $33.50 per $1,000 of assessed valuation, find the amount of tax on property assessed at $5,000.

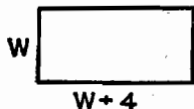20. Write in figures: four hundred twenty and two hundredths.

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. For which equation is 3 a value of *x*?   (a) $2x - 5 = 11$ (b) $\frac{x}{4} = 12$ (c) $3x + 1 = 10$

22. If $x = 5$ and $y = 4$, the value of $x^2 - 2y$ is   (a) 17   (b) 2   (c) 33

23. The perimeter of the rectangle in the diagram is   (a) $4W + 8$ (b) $12W$ (c) $2W + 4$

24. The formula for finding the area of a circle is   (a) $A = 2\pi r$ (b) $A = \pi r^2$ (c) $A = \pi d$

25. To solve the equation $4w = 12$, a pupil should   (a) subtract 4 from both sides of the equation   (b) multiply both sides of the equation by 4   (c) divide both sides of the equation by 4

26. The floor plan of a house is represented on a blueprint. This is an example of   (a) similarity   (b) congruence   (c) equality

27. The line AC in the diagram is a   (a) parallel   (b) bisector   (c) diagonal
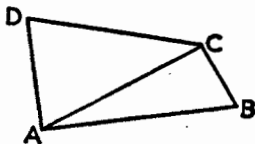
28. A triangle can be constructed having sides whose lengths are   (a) 6 in., 4 in., 3 in.   (b) 5 in., 3 in., 8 in.   (c) 3 in., 2 in., 6 in.

29. In a square whose side is 7 feet, the area in square feet is   (a) 14   (b) 28   (c) 49

30. The lengths of the legs of a right triangle are 3 inches and 4 inches. The length of the hypotenuse of this triangle in inches is   (a) 5   (b) 7   (c) 25

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. A salesman receives a salary of $300 a month and a commission of 3½% on total sales over $5,000 made during the month. During one month his total sales were $14,870. How much in all did he earn that month?   [10]

32. A certain store advertised: "All stock reduced 25%. Charge accounts available. No down payment; pay ½ on February 10, ⅓ on March 10 and the balance on April 10." If a customer used his charge account during this period to buy a coat which originally had been marked $110,

a. find the reduction in price   [2]
b. find the sales price of the coat   [2]
c. find the amount due on February 10   [2]
d. find the amount due on March 10   [2]
e. find the balance due on April 10   [2]

33. Below is a table for premiums on ordinary life insurance:

If taken out at age	Annual premium per $1,000 of insurance
20	$18.25
25	$20.75
30	$23.75
35	$27.50
40	$32.50

A man took out four of these insurance policies as follows: $1,000 at age 20; $2,000 at age 25; $2,000 at age 30; $5,000 at age 35.

a. Find the total amount of insurance he has now on these four policies.   [2]
b. Find the annual premium he pays on *each* of the four policies.   [4]
c. Find the *total* premium he pays per year on the four policies.   [2]
d. How much more does it cost him per year for the policy taken out at age 30 than for the one taken out at age 25?   [2]

34. A room is 30 feet long, 28 feet wide and 12 feet high.

a. Find the number of square feet in its floor area.   [4]
b. If its window area is 25% of its floor area, find the number of square feet in its window area.   [2]
c. How many cubic feet of space are there in this room?   [4]

35. A family of four is planning a trip by car. The main expenses that the members are considering are car expenses, food, and overnight lodging. They first estimated the length of the trip to be 4,000 miles, but later plans increased the total estimated mileage by 25%.

   a. How many miles do they expect to cover on the whole trip? [2]
   b. If 5 cents a mile will cover car expenses, how much would they spend for car expenses on the trip?   [2]
   c. Last summer the family opened a vacation club account at the bank and will have paid into it for 20 weeks. How much should have been deposited each week to cover car expenses for the trip?   [2]
   d. If they plan to average 250 miles per day, how many days will the trip take?   [2]
   e. If they estimate food and lodging will cost $7 a day for *each* person, how much do they expect to pay for food and lodging for the four people for the entire trip?   [2]

36. In a junior high school of 1,200 pupils, there are 50 more girls than boys.

   a. If the number of boys is represented by n, represent the number of girls in terms of n.   [2]
   b. Represent the total number of pupils in terms of n.   [2]
   c. Write an equation which shows that the total number of pupils in the school is 1,200.   [2]
   d. Solve the equation to find the number of boys in the school. [2]
   e. How many girls are there in the school?   [2]

37. In the figure at the right, $ABCD$ is a square. Diagonals AC and BD intersect at O. The following statements about the diagram are either true or false. 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.   [10]
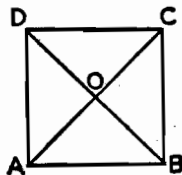
   a. $AB = BC$.
   b. DC is perpendicular to AB.
   c. Angle $CAB = 45°$.

d. Angles *DAB*, *ABC*, *BCD*, and *CDA* are equal.

e. Angle *AOB* is acute.

58. List the letters *a-e* on your answer paper. Opposite *each* letter write the *number* 1, 2 or 3, representing the correct answer.　　[10]

a. A circle graph is to be drawn in which one sector is to be 20% of the circle. The central angle of the sector should contain　(1) 36°　(2) 72°　(3) 90°

b. A circle graph is to be drawn in which the central angle for a sector is 108 degrees. This sector represents what percent of the circle?　(1) 30%　(2) 40%　(3) 50%

c. Each of the small houses in the pictogram represents 100,000 houses. How many houses are represented by the figures shown?
(1) 300,500　(2) 305,000　(3) 350,000

d. What amount of money is represented by the bar in the diagram at the right?　(1) $2,-050,000　(2)　$2,250,000　(3) $2,500,000

MILLIONS OF DOLLARS

e. The graph in the diagram shows the population of a suburban town at intervals of 5 years from 1945 through 1955. How much more did the population increase between 1950 and 1955 than it did between 1945 and 1950?　(1) 500　(2) 1,000　(3) 1,500