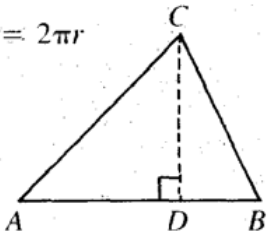
SECTION 2 **Time—50 minutes**
50 Questions

In this section solve each problem, using any available space on the page for scratchwork. Then decide which is the best of the choices given and fill in the corresponding circle on the answer sheet.

The following information is for your reference in solving some of the problems.

Circle of radius r: Area $= \pi r^2$ Circumference $= 2\pi r$
The number of degrees of arc in a circle is 360.
The measure in degrees of a straight angle is 180.



Triangle: The sum of the measures in degrees of the angles of a triangle is 180.

If $\angle CDA$ is a right angle, then
(1) area of $\triangle ABC = \frac{AB \times CD}{2}$
(2) $AC^2 = AD^2 + DC^2$

Definitions of symbols:

$=$ is equal to	$\leqq$ is less than or equal to
$\neq$ is unequal to	$\geqq$ is greater than or equal to
$<$ is less than	$\parallel$ is parallel to
$>$ is greater than	$\perp$ is perpendicular to

Note: Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated. All numbers used are real numbers.

1. $(146 \times 117) + (173 \times 146) + (146 \times 210)$ equals
(A) 69,000 (B) 70,000 (C) 71,000
(D) 72,000 (E) 73,000

2. A certain grade of eggs has a weight of 24 to 26 ounces per dozen. What is the minimum weight (in ounces) of 69 such eggs?
(A) 138 (B) 143 (C) 149 (D) 1656 (E) 1716

3. A boy has 85 cents in 12 coins consisting of nickels and dimes. How many coins are nickels?
(A) 5 (B) 6 (C) 7 (D) 8 (E) 9

4. L is east of M and west of N. J is southeast of N. M is southeast of F. Which is farthest west?
(A) F (B) G (C) J (D) M (E) N

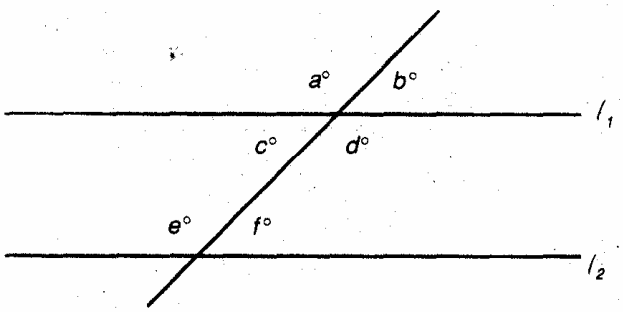
5. How many four-cent baseball cards can I purchase without receiving change for one dollar after buying twenty three-cent cards?
(A) 4 (B) 5 (C) 10 (D) 25 (E) 40

6. How many ounces are there in a cup of shredded coconut if 6 cups weigh one pound?
(A) 0.6 (B) 0.16 (C) 1.6 (D) 2.6 (E) 4.3

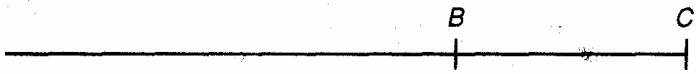
7. The cost of sending a telegram to a certain city is 85¢ for the first 15 words and $3\frac{1}{2}$¢ for each additional word, exclusive of tax. How many words did my telegram contain if I paid \$1.97, which included a tax of 70¢?
(A) 12 (B) 27 (C) 36 (D) 47 (E) 147

8. A man who owned $\frac{1}{4}$ share of a business sold $\frac{1}{3}$ of his control last year and sold $\frac{5}{12}$ of his remaining share this year. What part of the business does he now own?
(A) $\frac{1}{5}$ (B) $\frac{5}{144}$ (C) $\frac{7}{72}$ (D) $\frac{65}{72}$ (E) 0

9. What is the value of $\frac{1}{\sqrt{2}}$ correct to the nearest hundredth? ($\sqrt{2} = 1.414$)
(A) 0.67 (B) 0.68 (C) 0.69 (D) 0.70
(E) 0.71



10. If $l_1 \parallel l_2$, then all of the following are true EXCEPT
(A) $d = a$ (B) $c = f$ (C) $e = a$ (D) $f = b$
(E) $c = d$



11. If $AB = 12$ and $BC = 6$, what is the length of a segment joining the midpoints of AB and BC?
(A) 6 (B) 9 (C) 12 (D) 15 (E) 18

12. A disease killed $\frac{2}{3}$ of the chickens on a farm. The owner then inoculated $\frac{1}{2}$ of the remaining chickens to prevent infection. If 100 were inoculated, how many chickens were lost before the treatment?
(A) 150 (B) 200 (C) 300 (D) 400
(E) 600

13. $\frac{2m}{3} = \frac{b}{a}, \frac{2m}{b} =$

(A) $\frac{a}{b}$ (B) $\frac{3}{a}$ (C) $\frac{a}{3}$ (D) a (E) b

14. What is the value of $\frac{3y^2 - x^2}{\frac{1}{2}a^3}$ when $x = -2$, $y = 3$, and $a = -1$?
(A) $2\frac{7}{8}$ (B) -46 (C) 46 (D) -64 (E) 64

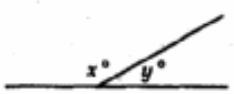
15. By selling a television set for \$260 a dealer finds he is making a profit of 30% of cost. At what price must he sell it to make a profit of 40% of cost?
(A) \$196.00 (B) \$254.80 (C) \$280.00
(D) \$282.00 (E) \$322.00

Questions 16-32 each consist of two quantities, one in Column A and one in Column B. You are to compare the two quantities and on the answer sheet fill in circle

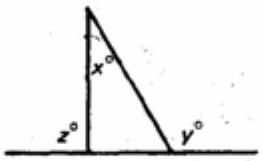
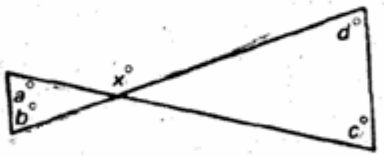
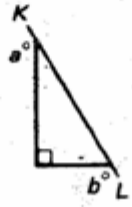
A if the quantity in Column A is greater;
B if the quantity in Column B is greater;
C if the two quantities are equal;
D if the relationship cannot be determined from the information given.

Notes:
1. In certain questions, information concerning one or both of the quantities to be compared is centered above the two columns.
2. In a given question, a symbol that appears in both columns represents the same thing in Column A as it does in Column B.
3. Letters such as x, n, and k stand for real numbers.

EXAMPLES

	Column A	Column B	Answers
E1.	2×6	$2 + 6$	● Ⓑ Ⓒ Ⓓ
E2.	 $180 - x$	y	Ⓐ Ⓑ ● Ⓓ
E3.	$p - q$	$q + p$	Ⓐ Ⓑ Ⓒ ●

	Column A	Column B
16.	$\frac{6 + 6 + 6}{6 - 6 - 6}$	$\frac{3 + 3 + 3}{3 - 3 - 3}$
17.	0.04	$\frac{1}{25}$
18.	0.12	$\sqrt{1.44}$
	$x^2 = 25$	
19.	x	5

	COLUMN A	COLUMN B
	$0 < p < q$	
20.	$\frac{1}{q}$	$\frac{1}{p}$
	$a = 2, b = 1$, and $c = 0$	
21.	$4a + 2b + 3c^3$	10
22.	105% of 500	50% of 1000
	$2x + y = 16$	
23.	x	y
24.	The average of the measure of the angles of quadrilateral $ABCD$	The average of the measure of the angles of square $KLMN$
	 $x = 30$ and $y = 120$	
25.	z	90
		
26.	$a + b + c + d$	x
	 KL is a straight line.	
27.	$a + b$	270

$2^{n+2} = 8$

28.	n	3

$x > 1$
$y > 1$

29.	$xy + 5$	$x(y + 5)$

AC is the hypotenuse of $\triangle ABC$.

30.	Measure of $\angle B$	Sum of the measures of $\angle A$ and $\angle C$

31.	$\frac{5x + 6}{5}$	$x + 1$

$A \neq 0$

32.	A^{-1}	A

Solve each of the remaining problems in this section using any available space for scratchwork. Then decide which is the best of the choices given and fill in the corresponding circle on the answer sheet.

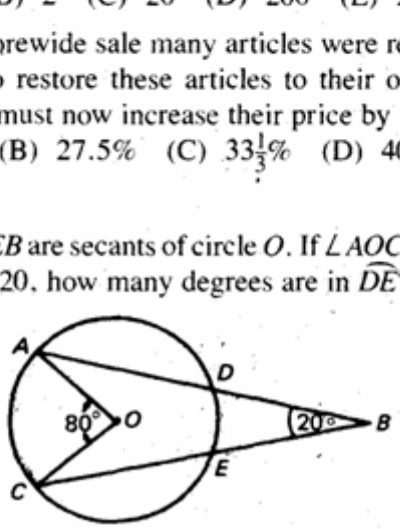
33. What percent of a foot is a yard?
(A) 3% (B) $\frac{1}{3}$ (C) $33\frac{1}{3}\%$ (D) 300%
(E) $333\frac{1}{3}\%$

34. How long is the shadow of a 35-foot tree, if a 98-foot tree casts a 42-foot shadow at the same time?
(A) 14 (B) 15 ft. (C) 16 ft. (D) 17 ft.
(E) 18 ft.

35. If 4% of motorists on the turnpike leave at a certain exit and 5% of these go to one particular motel for lodging, out of every 10,000 motorists how many motorists may be exptected to go to this motel?
(A) 0.2 (B) 2 (C) 20 (D) 200 (E) 2000

36. During a storewide sale many articles were reduced by 25%. To restore these articles to their original prices they must now increase their price by
(A) 25% (B) 27.5% (C) $33\frac{1}{3}\%$ (D) 40%
(E) 50%

37. ADB and CEB are secants of circle O. If $\angle AOC \stackrel{\circ}{=} 80$ and $\angle B \stackrel{\circ}{=} 20$, how many degrees are in $\overset{\frown}{DE}$?



(A) 40 (B) 60 (C) 80 (D) 120 (E) 140

38. Candy which formerly sold for \$1.20 per pound is now packaged in two-pound boxes which sell for \$3.00. The ratio of the old price to the new price is
(A) 1:5 (B) 2:5 (C) 3:5 (D) 4:5
(E) 5:4

39. In right $\triangle ABC$, leg AB = leg BC. The area of the triangle is 12.5. Hypotenuse AC equals
(A) $\sqrt{5}$ (B) $5\sqrt{2}$ (C) 5 (D) $4\sqrt{5}$ (E) 25

40. A rectangular field 50 meters in width and 120 meters in length is divided into two fields by a diagonal line. What is the length of fence (in meters) required to enclose one of these fields?
(A) 130 (B) 170 (C) 180 (D) 200
(E) 300

41. If there are 5 to 8 eggs in a pound, what is the maximum number of eggs in 40 pounds?
(A) 5 (B) 8 (C) 160 (D) 200 (E) 320

42. A point, X, is 25 feet from the center of a circle. If the diameter of the circle is 14 feet, what is the length (in feet) of a tangent from point X to the circle?
(A) $\sqrt{29}$ (B) 18 (C) $15\sqrt{2}$ (D) 24
(E) $\sqrt{673}$

43. Linda did 24 problems out of 25 correctly. In the next test she did twice as many examples correctly but received a mark only half as good. How many problems were there in the second test?
(A) 25 (B) 48 (C) 50 (D) 75 (E) 100

44. If a garage can wash 5 cars in 25 minutes, how long would it take to wash 25 cars?
(A) 2 hrs. (B) 2 hrs. 5 min. (C) 5 hrs.
(D) 25 hrs. (E) none of these

45. A secondhand car dealer sold a car for Mr. Dee and, after deducting 5% commission, remitted \$4750 to Mr. Dee. What was the selling price of the car?
(A) \$2375 (B) \$4773 (C) \$5000
(D) \$5500 (E) \$50,000

46. If $a - 1$ is an even integer, which of the following must be odd?
I. $3(a - 3)$
II. $2a + 1$
III. $a(a - 1)$
(A) I only (B) II only (C) III only
(D) I and II only (E) I, II, and III

47. If n is a positive integer, which of the following could be a possible value of $\frac{-1^n}{(-1)^n}$?

I. 1
II. -1
III. $\frac{1}{n}$

(A) I only (B) II only (C) III only
(D) I and II only (E) I, II, and III

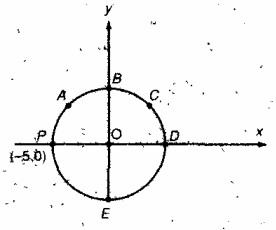
48. For what values of n and d is $\frac{n}{d} > 1$?

(A) $n = 5, d = 6$ (B) $n = 3, d = 2$
(C) $n = 1, d = 2$ (D) $n = 1, d = 1$
(E) $n = 0, d = 1$

49. In a shipment of 25 stereo components, only 80% of these parts were accepted as satisfactory. How many were not accepted in this shipment?

(A) 5 (B) 6 (C) 10 (D) 15 (E) 20

50. In this figure the lettered points are on the circumference of the circle with center O. Which letter represents the point with coordinates (5,0)?



(A) A (B) B (C) C (D) D (E) E

Mathematical Aptitude Section

Note: Each correct answer to the mathematics questions is keyed by number to the corresponding topic in Chapters 9 and 10. These numerals refer to the topics listed below, with specific page references in parentheses.

1. Basic Fundamental Operations (155–157)
2. Algebraic Operations (157–160)
3. Using Algebra (160–164)
4. Exponents, Roots and Radicals (159–160)
5. Inequalities (164–165)
6. Fractions (176–178)
7. Decimals (176)
8. Percent (178–180)
9. Averages (180–181)
10. Motion (182–183)
11. Ratio and Proportion (183–185)
12. Mixtures and Solutions (177–178)
13. Work (185–186)
14. Coordinate Geometry (172–173)
15. Geometry (165–172, 173–176)
16. Quantitative Comparisons (189–192)

ANSWER KEY

1. **E** (1)	*11.* **B** (15)	*21.* **C** (2,16)	*31.* **A** (2,16)	*41.* **E** (1,11)
2. **A** (1)	*12.* **D** (6)	*22.* **A** (8,16)	*32.* **D** (4,16)	*42.* **D** (15)
3. **C** (3)	*13.* **B** (2,6)	*23.* **D** (2,16)	*33.* **D** (1,8)	*43.* **E** (3)
4. **A** (15)	*14.* **B** (2)	*24.* **C** (15,16)	*34.* **B** (11)	*44.* **B** (11)
5. **C** (1)	*15.* **C** (3,8)	*25.* **C** (15,16)	*35.* **C** (8)	*45.* **C** (3,8)
6. **D** (1)	*16.* **C** (6,16)	*26.* **A** (15,16)	*36.* **C** (8)	*46.* **B** (1)
7. **B** (1)	*17.* **C** (6,7,16)	*27.* **C** (15,16)	*37.* **A** (15)	*47.* **D** (2)
8. **C** (6)	*18.* **B** (4,16)	*28.* **B** (4,16)	*38.* **D** (11)	*48.* **B** (1)
9. **E** (1,4)	*19.* **D** (2,16)	*29.* **B** (2,16)	*39.* **B** (15)	*49.* **A** (8)
10. **E** (15)	*20.* **B** (6,16)	*30.* **C** (15,16)	*40.* **E** (15)	*50.* **D** (14)