

SECTION 1  
Time—25 Minutes  
16 Questions

Directions: In this section solve each problem, using any available space on the page for scratchwork. Then indicate the best of the answer choices given.

Numbers: All numbers used are real numbers.

Figures: Figures that accompany problems in this section 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.

1. If  $\frac{4}{5 - \frac{a}{b}} = 1$ , which of the following must be true?

- (A)  $a = 0$
- (B)  $b = 0$
- (C)  $a = 1$
- (D)  $b = 1$
- (E)  $a = b$

$$y = kx + 3$$

2. In the equation above,  $k$  is a constant. If  $y = 17$  when  $x = 2$ , what is the value of  $y$  when  $x = 4$ ?

- (A) 34
- (B) 31
- (C) 14
- (D) 11
- (E) 7

3. In 1989 the price of a new model  $S$  car was  $x$  dollars. If the price of the model  $S$  car increased each year by 10 percent of the previous year's price, what was the price of the car, in dollars, in 1991?

- (A)  $1.10x$
- (B)  $1.20x$
- (C)  $1.21x$
- (D)  $1.25x$
- (E)  $1.33x$

4. If  $n$  is a prime number greater than 3, what is the remainder when  $n^2$  is divided by 12?

- (A) 0
- (B) 1
- (C) 2
- (D) 3
- (E) 5

5. NOT SCORED.

6. If a subscription for 10 issues of a magazine costs \$24.00 and represents a savings of 20 percent of the cover price, what is the cover price per issue?

- (A) \$1.98
- (B) \$2.40
- (C) \$2.80
- (D) \$2.86
- (E) \$3.00

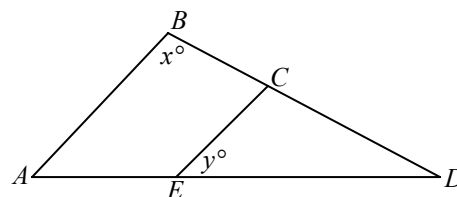
7. Each edge of a cubical block of wood measures 2 inches. What is the surface area of the block in square inches?

- (A) 4
- (B) 8
- (C) 12
- (D) 16
- (E) 24

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# CREATE YOUR OWN SUNDAE

12 Ice Cream Flavors  
10 Kinds of Candies  
8 Liquid Toppings  
5 Kinds of Nuts  
With or Without Whipped Cream



Note: Figure not drawn to scale.

8. If a customer makes exactly one selection from each of the five categories shown in the table above, what is the greatest possible number of ice cream sundaes that a customer can create?

(A) 9,600  
(B) 4,800  
(C) 2,400  
(D) 800  
(E) 400

9. The average (arithmetic mean) of 4 positive integers is 50. If the average of 2 of these integers is 45, what is the greatest possible value that one of the other 2 integers can have?

(A) 55  
(B) 65  
(C) 100  
(D) 109  
(E) 115

10. Machine  $A$  working alone can complete a job in  $3\frac{1}{2}$  hours. Machine  $B$  working alone can do the same job in  $4\frac{2}{3}$  hours. How long will it take both machines working together at their respective constant rates to complete the job?

(A) 1 hr 10 min  
(B) 2 hr  
(C) 4 hr 5 min  
(D) 7 hr  
(E) 8 hr 10 min

11. What is the smallest positive integer  $n$  for which 324 is a factor of  $6^n$ ?

(A) 2  
(B) 3  
(C) 4  
(D) 5  
(E) 6

12. In the figure above, if  $AB \parallel CE$ ,  $CE = DE$ , and  $y = 45$ , then  $x =$

(A) 45  
(B) 60  
(C) 67.5  
(D) 112.5  
(E) 135

From \ To	A	B	C	D	E	F
A		3	3	2	7	3
B	3		3	4	5	5
C	3	3		1	2	4
D	2	4	1		5	5
E	7	5	2	5		6
F	3	5	4	5	6	

13. The table above shows the cost, in dollars, of traveling to and from cities  $A$ ,  $B$ ,  $C$ ,  $D$ ,  $E$ , and  $F$ . A sales representative wants to leave from  $A$ , travel to  $C$ ,  $E$ , and  $F$ , and return to  $A$ . If the first city that the sales representative travels to must be  $E$ , what is the minimum possible cost for the entire trip?

(A) \$13  
(B) \$14  
(C) \$16  
(D) \$18  
(E) \$20

14. A retailer sold an appliance for 30 percent above cost, which represented a gross profit of \$21.00. For what price did the retailer sell the appliance?

(A) \$27.30  
(B) \$51.00  
(C) \$63.00  
(D) \$70.00  
(E) \$91.00

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15. How many integers between 324,700 and 458,600 have tens digit 1 and units digit 3?
- (A) 10,300  
(B) 10,030  
(C) 1,353  
(D) 1,352  
(E) 1,339
16. A breakfast that consists of 1 ounce of corn puffs and 8 ounces of fruit  $X$  provides 257 calories. When 8 ounces of fruit  $Y$  is substituted for the 8 ounces of fruit  $X$ , the total number of calories is reduced to 185. If fruit  $X$  provides 1.8 times as many calories as fruit  $Y$ , how many calories does 8 ounces of fruit  $Y$  alone provide?
- (A) 11.25  
(B) 72  
(C) 90  
(D) 95  
(E) 129.6

## **STOP**

IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.

DO NOT TURN TO ANY OTHER SECTION IN THE TEST

SECTION 4  
Time—25 Minutes  
16 Questions

Directions: In this section solve each problem, using any available space on the page for scratchwork. Then indicate the best of the answer choices given.

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1. Of the people who responded to a market survey, 120 preferred Brand  $X$  and the rest preferred Brand  $Y$ . If the respondents indicated a preference for Brand  $X$  over Brand  $Y$  by a ratio of 3 to 1, how many people responded to the survey?

(A) 80  
(B) 160  
(C) 240  
(D) 360  
(E) 480

2.  $(x + 3y)^2 =$

(A)  $x^2 + 3y^2$   
(B)  $x^2 + 9y^2$   
(C)  $x^2 + 3xy + 3y^2$   
(D)  $x^2 + 3xy + 9y^2$   
(E)  $x^2 + 6xy + 9y^2$

3. At Company  $K$ , 15 percent of the employees are secretaries and 60 percent are salespeople. If there are 45 other employees of Company  $K$ , how many employees does Company  $K$  have?

(A) 160  
(B) 180  
(C) 190  
(D) 200  
(E) 400

4.  $\frac{1}{1 + \frac{1}{3}} - \frac{1}{1 + \frac{1}{2}} =$

(A)  $-\frac{1}{3}$   
(B)  $-\frac{1}{6}$   
(C)  $-\frac{1}{12}$   
(D)  $\frac{1}{12}$   
(E)  $\frac{1}{3}$

5. If  $x$  and  $y$  are negative integers, which of the following must be true?

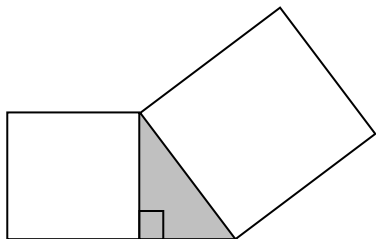
I.  $x - y < 0$   
II.  $\frac{x}{y} > y$   
III.  $x^2 > y$

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

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6. A certain hotel has 1,400 single rooms and 420 double rooms. Each room is cleaned by one person. If one person can clean a single room every 15 minutes and a double room every 20 minutes, how many cleaning persons are needed to clean all of the rooms if each person works for exactly 7 hours?

(A) 65  
(B) 70  
(C) 80  
(D) 90  
(E) 265



7. In the figure above, the two square regions have areas 16 and 25, respectively. What is the area of the shaded triangular region?

(A) 6  
(B) 8  
(C) 9  
(D) 12  
(E) 15

8. If the consumer price index for a sample of goods and services purchased in Dallas rose from 100 at the end of 1967 to  $x$  at the end of 1985, what was the average (arithmetic mean) annual increase in the index over this period?

(A)  $\frac{x+100}{18}$   
(B)  $\frac{x}{18}$   
(C)  $\frac{100-x}{18}$   
(D)  $\frac{x-100}{18}$   
(E)  $\frac{100x}{18}$

9. At a certain instant in time, the number of cars,  $N$ , traveling on a portion of a certain highway can be estimated by the formula

$$N = \frac{20Ld}{600 + s^2}$$

where  $L$  is the number of lanes in the same direction,  $d$  is the length of the portion of the highway, in feet, and  $s$  is the average speed of the cars, in miles per hour. Based on the formula, what is the estimated number of cars traveling on a  $\frac{1}{2}$  mile portion of the highway if the highway has 2 lanes in the same direction and the average speed of the cars is 40 miles per hour? (5,280 feet = 1 mile)

(A) 155  
(B) 96  
(C) 80  
(D) 48  
(E) 24

10. In how many different ways can 3 people be assigned to fill 3 different positions so that each person is assigned to exactly one position?

(A) Twelve  
(B) Nine  
(C) Six  
(D) Three  
(E) One

11. A point on the edge of a fan blade that is rotating in a plane is 10 centimeters from the center of the fan. What is the distance traveled, in centimeters, by this point in 15 seconds when the fan runs at the rate of 300 revolutions per minute?

(A)  $750\pi$   
(B)  $1,500\pi$   
(C)  $1,875\pi$   
(D)  $3,000\pi$   
(E)  $7,500\pi$

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12. A 2-year certificate of deposit is purchased for  $k$  dollars. If the certificate earns interest at an annual rate of 6 percent compounded quarterly, which of the following represents the value, in dollars, of the certificate at the end of the 2 years?
- (A)  $(1.06)^2 k$   
 (B)  $(1.06)^8 k$   
 (C)  $(1.015)^2 k$   
 (D)  $(1.015)^8 k$   
 (E)  $(1.03)^4 k$
13. If the sum of the first  $n$  positive integers is  $S$ , what is the sum of the first  $n$  positive even integers, in terms of  $S$ ?
- (A)  $\frac{S}{2}$   
 (B)  $S$   
 (C)  $2S$   
 (D)  $2S + 2$   
 (E)  $4S$
14. If  $x$  and  $y$  are positive numbers and  $z = xy^2$ , a 50 percent increase in  $x$  and 20 percent decrease in  $y$  would result in which of the following changes in  $z$ ?
- (A) A decrease of 4%  
 (B) A decrease of 14%  
 (C) An increase of 4%  
 (D) An increase of 20%  
 (E) An increase of 30%
15. If it is 6:27 in the evening on a certain day, what time in the morning was it exactly 2,880,717 minutes earlier? (Assume standard time in one location.)
- (A) 6:22  
 (B) 6:24  
 (C) 6:27  
 (D) 6:30  
 (E) 6:32
16. If  $n$  is an integer, which of the following CANNOT be a factor of  $3n + 4$ ?
- (A) 4  
 (B) 5  
 (C) 6  
 (D) 7  
 (E) 8

## S T O P

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## ANSWER KEY – Test Code 37

Section 1	Section 3	Section 4	Section 5	Section 6	Section 7
1. E	1. C	1. B	1. A	1. E	1. B
2. B	2. B	2. E	2. A	2. D	2. A
3. C	3. E	3. B	3. E	3. Not Scored	3. B
4. B	4. A	4. D	4. A	4. A	4. B
5. Not Scored	5. E	5. E	5. D	5. C	5. D
6. E	6. D	6. B	6. E	6. D	6. E
7. E	7. E	7. A	7. B	7. D	7. C
8. A	8. B	8. D	8. A	8. A	8. B
9. D	9. C	9. D	9. E	9. C	9. E
10. B	10. B	10. C	10. C	10. E	10. C
11. C	11. C	11. B	11. E	11. D	11. D
12. C	12. D	12. D	12. D	12. C	12. A
13. C	13. D	13. C	13. A	13. B	13. D
14. E	14. A	14. A	14. B	14. A	14. D
15. E	15. C	15. D	15. C	15. D	15. C
16. C	16. C	16. C	16. C	16. A	16. E
	17. B			17. C	17. B
	18. E			18. B	18. E
	19. D			19. B	
	20. A			20. A	
	21. A				
	22. B				