

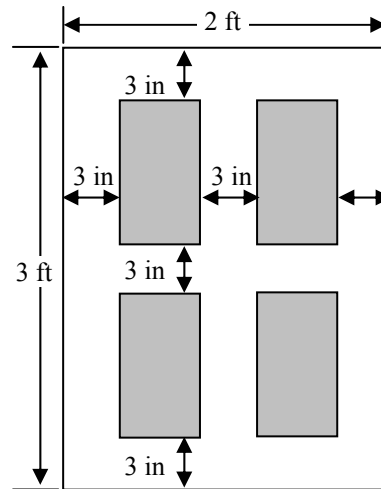
SECTION 5  
Time—25 Minutes  
16 Questions

**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  $x$  is 11 percent greater than 80, then  $x =$
- (A) 70.9  
(B) 71.2  
(C) 88.0  
(D) 88.8  
(E) 91.0
2. A certain car uses 12 gallons of gasoline in traveling 240 miles. In order for the car to travel the same distance using 10 gallons of gasoline, by how many miles per gallon must the car's gas mileage be increased?
- (A) 2  
(B) 4  
(C) 6  
(D) 8  
(E) 10



3. The figure above represents a window, with the shaded regions representing the openings for the glass. If all line segments in the figure are either horizontal or vertical and the openings are all the same size, what are the dimensions, in inches, of each opening? (1 foot = 12 inches)
- (A) 12.0 by 18.0  
(B) 10.5 by 16.5  
(C) 9.0 by 15.0  
(D) 8.0 by 10.0  
(E) 7.5 by 13.5
4. A farmer used 1,034 acres of land for beans, wheat, and corn in the ratio of 5 : 2 : 4, respectively. How many acres were used for corn?
- (A) 188  
(B) 258  
(C) 376  
(D) 470  
(E) 517
5. If  $2x^2 + 4x - 5 = x^2 + 2x + x^2 + 5$ , then  $x^2 =$
- (A) 0  
(B) 4  
(C) 10  
(D) 25  
(E) 100

6.  $\sqrt{80} + \sqrt{125} =$
- (A)  $9\sqrt{5}$   
 (B)  $20\sqrt{5}$   
 (C)  $41\sqrt{5}$   
 (D)  $\sqrt{205}$   
 (E) 100
7. A circle graph shows how the budget of a certain company was spent: 63 percent for salaries, 12 percent for research and development, 6 percent for utilities, 5 percent for equipment, 4 percent for supplies, and the remainder for transportation. If the area of each sector of the graph is proportional to the percent of the budget it represents, how many degrees of the circle are used to represent transportation?
- (A)  $10^\circ$   
 (B)  $18^\circ$   
 (C)  $36^\circ$   
 (D)  $90^\circ$   
 (E)  $324^\circ$
8. What is the area of a square with perimeter  $P$ ?
- (A)  $16P^2$   
 (B)  $4P$   
 (C)  $\frac{P^2}{4}$   
 (D)  $\frac{P}{16}$   
 (E)  $\frac{P^2}{16}$
9. A certain ball was dropped from a window 8 meters above a sidewalk. On each bounce it rose straight up exactly one-half the distance of the previous fall. After the third bounce the ball was caught when it reached a height of exactly 1 meter above the sidewalk. How many meters did the ball travel in all?
- (A) 21  
 (B) 19  
 (C) 17  
 (D) 15  
 (E) 13
10. A certain store sells all maps at one price and all books at another price. On Monday the store sold 12 maps and 10 books for a total of \$38.00, and on Tuesday the store sold 20 maps and 15 books for a total of \$60.00. At this store, how much less does a map sell for than a book?
- (A) \$0.25  
 (B) \$0.50  
 (C) \$0.75  
 (D) \$1.00  
 (E) \$1.25
11. Which of the following procedures is always equivalent to adding 5 given numbers and then dividing the sum by 5?
- I. Multiplying the 5 numbers and then finding the 5<sup>th</sup> root of the product.  
 II. Adding the 5 numbers, doubling the sum, and then moving the decimal point one place to the left.  
 III. Ordering the 5 numbers numerically and then selecting the middle number.
- (A) None  
 (B) I only  
 (C) II only  
 (D) III only  
 (E) I and III
12. A certain company has records stored with a record-storage firm in 15-inch by 12-inch by 10-inch boxes. The boxes occupy 1.08 million cubic inches of space. If the company pays \$0.25 per box per month for record storage, what is the total amount that the company pays each month for record storage?
- (A) \$150  
 (B) \$300  
 (C) \$600  
 (D) \$1,200  
 (E) \$2,400

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13. If a 3-digit integer is selected at random from the integers 100 through 199, inclusive, what is the probability that the first digit and the last digit of the integer are each equal to one more than the middle digit?
- (A)  $\frac{2}{225}$   
(B)  $\frac{1}{111}$   
(C)  $\frac{1}{110}$   
(D)  $\frac{1}{100}$   
(E)  $\frac{1}{50}$
14. Mr. Kramer, the losing candidate in a two-candidate election, received 942,568 votes, which was exactly 40 percent of all the votes cast. Approximately what percent of the remaining votes would he need to have received in order to have won at least 50 percent of all the votes cast?
- (A) 10%  
(B) 12%  
(C) 15%  
(D) 17%  
(E) 20%
15. Which of the following inequalities is equivalent to  $-2 < x < 4$ ?
- (A)  $|x - 2| < 4$   
(B)  $|x - 1| < 3$   
(C)  $|x + 1| < 3$   
(D)  $|x + 2| < 4$   
(E) None of the above
16. If the average (arithmetic mean) of 5 positive temperatures is  $x$  degrees Fahrenheit, then the sum of the 3 greatest of these temperatures, in degrees Fahrenheit, could be
- (A)  $6x$   
(B)  $4x$   
(C)  $\frac{5x}{3}$   
(D)  $\frac{3x}{2}$   
(E)  $\frac{3x}{5}$

## STOP

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SECTION 7  
Time—25 Minutes  
16 Questions

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

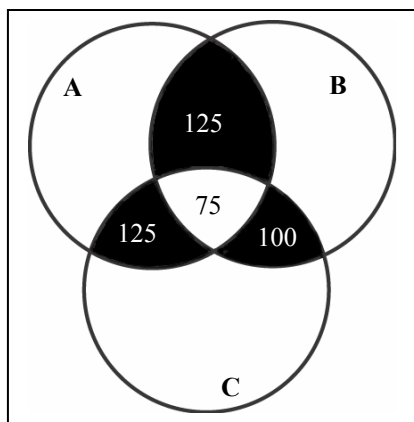
**Numbers:** All numbers used are real numbers.

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1. A certain taxi fare consists of an initial charge of \$1.25 and an additional charge of \$0.25 for each  $\frac{1}{5}$  mile traveled. What is the total fare for a trip of 2.4 miles?  
(A) \$4.25  
(B) \$3.00  
(C) \$2.25  
(D) \$1.85  
(E) \$1.75
2. If  $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = ad - bc$  for all numbers  $a$ ,  $b$ ,  $c$ , and  $d$ , then  $\begin{vmatrix} 3 & 5 \\ -2 & 4 \end{vmatrix} =$   
(A)  $-22$   
(B)  $-2$   
(C)  $2$   
(D)  $7$   
(E)  $22$
3. If the area of a square region having sides of length 6 centimeters is equal to the area of a rectangular region having width 2.5 centimeters, then the length of the rectangle, in centimeters, is  
(A) 8.5  
(B) 9.5  
(C) 9.6  
(D) 10.5  
(E) 14.4
4. The total cost for Company  $X$  to produce a batch of tools is \$10,000 plus \$3 per tool. Each tool sells for \$8. The gross profit earned from producing and selling these tools is the total income from sales minus the total production cost. If a batch of 20,000 tools is produced and sold, then Company  $X$ 's gross profit per tool is  
(A) \$3.00  
(B) \$3.75  
(C) \$4.50  
(D) \$5.00  
(E) \$5.50
5. Of the following, which is most nearly equal to  $\sqrt{10}$  ?  
(A) 3.1  
(B) 3.2  
(C) 3.3  
(D) 3.4  
(E) 3.5
6. Exactly  $\frac{1}{3}$  of the children in a certain class are girls. If there are 18 boys in the class, how many girls are in the class?  
(A) 6  
(B) 9  
(C) 12  
(D) 24  
(E) 27

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Questions 7-8 refer to the following information.



In a marketing survey for products  $A$ ,  $B$ , and  $C$ , 1,000 people were asked which of the products, if any, they use. The three circular regions in the diagram above represent the numbers of people who use products  $A$ ,  $B$ , and  $C$ , according to the survey results. Of the people surveyed, a total of 400 use  $A$ , a total of 400 use  $B$ , and a total of 450 use  $C$ .

7. How many of the people surveyed use exactly one of the products?

(A) 75  
(B) 100  
(C) 150  
(D) 250  
(E) 325

8. What percent of the people surveyed use product  $A$  or product  $B$  or both, but not product  $C$ ?

(A) 12.5%  
(B) 17.5%  
(C) 30%  
(D) 40%  
(E) 60%

9. If  $x = \frac{a}{2} + \frac{b}{2^3} + \frac{c}{2^4}$ , where  $a$ ,  $b$ , and  $c$  are each equal to 0 or 1, then  $x$  could be each of the following EXCEPT

(A)  $\frac{1}{16}$   
(B)  $\frac{3}{16}$   
(C)  $\frac{5}{16}$   
(D)  $\frac{10}{16}$   
(E)  $\frac{11}{16}$

10. The equation  $\frac{M+6}{36} = \frac{P-7}{21}$  relates two temperature scales. Where  $M$  is the number of degrees on one scale and  $P$  is the number of degrees on the other scale. Which of the following equations can be used to convert temperatures from the  $P$  scale to the  $M$  scale?

(A)  $M = \frac{7}{12}P + 13$   
(B)  $M = \frac{7}{12}P + 21$   
(C)  $M = \frac{12}{7}P - 12$   
(D)  $M = \frac{12}{7}P - 13$   
(E)  $M = \frac{12}{7}P - 18$

11. If  $x$  is a positive number and  $\frac{1}{2}$  the square root of  $x$  is equal to  $2x$ , then  $x =$

(A)  $\frac{1}{16}$   
(B)  $\frac{1}{4}$   
(C)  $\frac{1}{2}$   
(D) 2  
(E) 8

Score	Number of Students
83	5
70	6
92	3
	5
64	1

12. The incomplete table above shows a distribution of scores for a class of 20 students. If the average (arithmetic mean) score for the class is 78, what score is missing from the table?

(A) 73  
(B) 75  
(C) 77  
(D) 79  
(E) 81

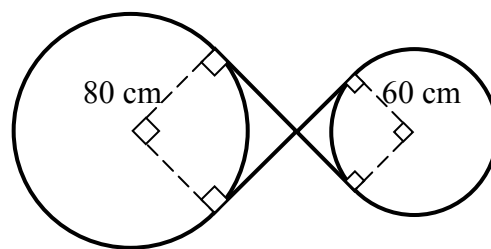
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13. Carl drove from his home to the beach at an average speed of 80 kilometers per hour and returned home by the same route at an average speed of 70 kilometers per hour. If the trip home took  $\frac{1}{2}$  hour longer than the trip to the beach, how many kilometers did Carl drive each way?

(A) 350  
(B) 345  
(C) 320  
(D) 280  
(E) 240

14. If  $5x = 6y$  and  $xy \neq 0$ , what is the ratio of  $\frac{1}{5}x$  to  $\frac{1}{6}y$ ?

(A)  $\frac{25}{6}$   
(B)  $\frac{36}{25}$   
(C)  $\frac{6}{5}$   
(D)  $\frac{5}{6}$   
(E)  $\frac{25}{36}$



15. The figure above shows a cord around two circular disks. If the radii of the two disks are 80 centimeters and 60 centimeters, respectively, what is the total length, in centimeters, of the cord?

(A)  $210\pi$   
(B)  $210\pi + 280$   
(C)  $280\pi$   
(D)  $280\pi + 80$   
(E)  $280\pi + 280$

16. If  $x$ ,  $y$ , and  $z$  are positive integers and  $3x = 4y = 7z$ , then the least possible value of  $x + y + z$  is

(A) 33  
(B) 40  
(C) 49  
(D) 61  
(E) 84

## STOP

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## ANSWER KEY

Section 1	Section 2	Section 4	Section 5	Section 6	Section 7
1. D	1. C	1. C	1. D	1. D	1. A
2. E	2. D	2. E	2. B	2. A	2. E
3. D	3. C	3. E	3. E	3. B	3. E
4. D	4. A	4. A	4. C	4. E	4. C
5. C	5. D	5. C	5. D	5. B	5. B
6. A	6. D	6. D	6. A	6. E	6. B
7. D	7. E	7. A	7. C	7. C	7. E
8. C	8. B	8. C	8. E	8. D	8. C
9. A	9. E	9. B	9. A	9. B	9. C
10. C	10. B	10. D	10. B	10. B	10. E
11. E	11. C	11. D	11. C	11. C	11. A
12. B	12. E	12. B	12. A	12. C	12. C
13. C	13. B	13. A	13. D	13. C	13. D
14. D	14. D	14. C	14. D	14. A	14. B
15. B	15. A	15. B	15. B	15. C	15. B
16. C	16. E	16. C	16. B	16. B	16. D
17. A	17. C	17. A			
18. B	18. D	18. D			
	19. C	19. E			
	20. E	20. E			
		21. E			
		22. B			