

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.

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. What is 25 percent of 20 percent of 75 ?

(A) 3.75  
(B) 15  
(C) 18.75  
(D) 25  
(E) 33.75

PAYROLL AT COMPANY X

Number of Employees	Salary
5	\$20,000
4	\$22,000
8	\$25,000
3	\$30,000

2. The table above shows the number of employees at each of four salary levels at Company X. What is the average (arithmetic mean) salary for the 20 employees?

(A) \$23,500  
(B) \$23,750  
(C) \$23,900  
(D) \$24,125  
(E) \$24,250

3. A store reported total sales of \$385 million for February of this year. If the total of sales for the same month last year was \$320 million, approximately what was the percent increase in sales?

(A) 2%  
(B) 17%  
(C) 20%  
(D) 65%  
(E) 83%

4. Which three of the following fractions are equivalent?

$$v = \frac{5}{80} \quad w = \frac{0.05}{0.08} \quad x = \frac{0.5}{8.0} \quad y = \frac{0.05}{0.8} \quad z = \frac{0.05}{0.008}$$

(A)  $v$ ,  $w$ , and  $x$   
(B)  $v$ ,  $x$ , and  $y$   
(C)  $w$ ,  $x$ , and  $y$   
(D)  $w$ ,  $y$ , and  $z$   
(E)  $x$ ,  $y$ , and  $z$

5. If  $a = \frac{b+c}{e}$ , then  $c =$

(A)  $(a-b)e$   
(B)  $ae-b$   
(C)  $\frac{ae}{b}$   
(D)  $\frac{b+a}{e}$   
(E)  $\frac{a}{e}-b$

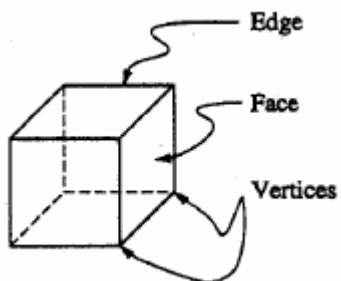
6. If  $\left(\frac{4a}{6}\right)\left(\frac{1}{7}\right)(4)\left(\frac{3}{2a}\right)(7)(x) = 1$  then  $x =$

(A)  $\frac{1}{4}$   
(B)  $\frac{1}{2}$   
(C) 2  
(D) 7  
(E) 8

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7. On June 1 a bicycle dealer noted that the number of bicycles in stock had decreased by 4 for each of the past 5 months. If the stock continues to decrease at the same rate for the rest of the year, how many fewer bicycles will be in stock on September 1 than were in stock on January 1?

(A) 8  
(B) 12  
(C) 20  
(D) 32  
(E) 36



8. In the figure above, an edge, a face, and two vertices of a cube are indicated. If  $e$ ,  $f$ , and  $v$  denote the number of edges, faces, and vertices, respectively, of a cube, which of the following is true?

(A)  $e + f = v + 8$   
(B)  $e + f = v + 6$   
(C)  $e + f = 20 - v$   
(D)  $e - f = v - 2$   
(E)  $e - f = \frac{v}{2}$

$Q$	$R$
$P$	$S$

9. The figure above shows a rectangular parcel of undeveloped land partitioned into four regions,  $P$ ,  $Q$ ,  $R$ , and  $S$ . In square meters, the area of square region  $Q$  is  $x^2$ , the area of rectangular region  $R$  is  $5x$ , and the area of rectangular region  $P$  is  $4x$ . What is the area, in square meters, of rectangular region  $S$ ?

(A)  $x^2 - x$   
(B)  $x^2 + 9x$   
(C)  $20x - x^2$   
(D) 9  
(E) 20

10. From the sale of sleeping bags, a retailer made a gross profit of 12 percent of the wholesale cost. If each sleeping bag was sold for \$28, what was the wholesale cost per bag?

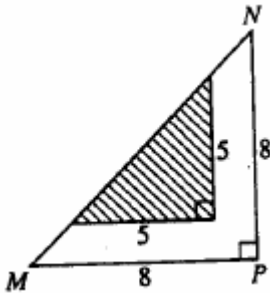
(A) \$3.00  
(B) \$3.36  
(C) \$24.64  
(D) \$25.00  
(E) \$31.36

11. If  $y = 3x + 2$  and  $y = -4 - 6x$  what is the value of  $y$ ?

(A)  $-\frac{2}{3}$   
(B) 0  
(C) 2  
(D) 8  
(E) 16

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12. Of the 100 pet owners who responded to a survey, 50 own cats, 42 own dogs, and 7 own both. How many respondents own neither a cat nor a dog?
- (A) 7  
(B) 8  
(C) 10  
(D) 12  
(E) 15



13. In the figure above, the perimeter of  $\triangle MNP$  is how much greater than the perimeter of the shaded region?
- (A)  $2 + \sqrt{2}$   
(B) 6  
(C)  $8\sqrt{2}$   
(D)  $6 + 3\sqrt{2}$   
(E)  $6 + 8\sqrt{2}$
14. How many different groups of 3 people can be formed from a group of 5 people?
- (A) 5  
(B) 6  
(C) 8  
(D) 9  
(E) 10

15. In a certain sequence, the term  $x_n$  is given by the formula  $x_n = 2x_{n-1} - \frac{1}{2}(x_{n-2})$  for all  $n \geq 2$ . If  $x_0 = 3$  and  $x_1 = 2$ , what is the value of  $x_3$ ?
- (A) 2.5  
(B) 3.125  
(C) 4  
(D) 5  
(E) 6.75

16. Fox jeans regularly sell for \$15 a pair and Pony jeans regularly sell for \$18 a pair. During a sale these regular unit prices are discounted at different rates so that a total of \$9 is saved by purchasing 5 pairs of jeans: 3 pairs of Fox jeans and 2 pairs of Pony jeans. If the sum of the two discounts rates is 22 percent, what is the discount rate on Pony jeans?
- (A) 9%  
(B) 10%  
(C) 11%  
(D) 12%  
(E) 15%

## 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 6

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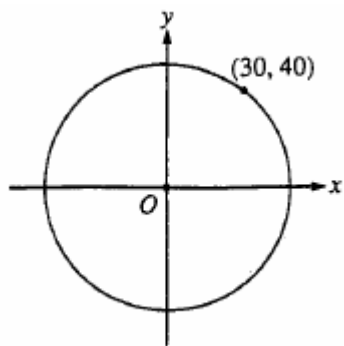
Figures: Figures that accompany problems in this section are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

1. For all integers  $a$ ,  $b$ ,  $c$ , and  $d$ ,  $*(a, b, c, d)$  is defined as  $a - b + c - d$ . What is the value of  $*(1, 3, 8, 5)$ ?  
(A) -1  
(B) 0  
(C) 1  
(D) 2  
(E) 3
2. For a certain company, operating costs and commissions totaled \$550 million in 1990, representing an increase of 10 percent from the previous year. The sum of operating costs and commissions for both years was  
(A) \$1,000 million  
(B) \$1,050 million  
(C) \$1,100 million  
(D) \$1,150 million  
(E) \$1,155 million
3. A certain computer file contains 8,000 data records, each of which needs to be updated. If it takes 20 seconds to update 100 records, then at the same rate, approximately how many minutes will it take to update all of the records in the file?  
(A) 16  
(B) 27  
(C) 67  
(D) 80  
(E) 160
4. If  $x - 3y = -20$ , then  $2x - 6y =$   
(A) -40  
(B) -10  
(C) 0  
(D) 10  
(E) 40
5. A car salesman earns a base salary of \$1,000 per month plus a commission of \$200 for each car he sells. If he earned \$2,200 in February, how many cars does he have to sell in March in order to double his February earnings?  
(A) 6  
(B) 11  
(C) 12  
(D) 17  
(E) 22
6. Which of the following is equivalent to the pair of inequalities  $x + 6 > 10$  and  $x - 3 \leq 5$ ?  
(A)  $2 \leq x < 16$   
(B)  $2 \leq x < 4$   
(C)  $2 < x \leq 8$   
(D)  $4 < x \leq 8$   
(E)  $4 \leq x < 16$

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7. Before leaving on a trip, Ms. Rods exchanged 500 United States dollars for German marks at an exchange rate of 1.55 marks per dollar. When the trip was canceled, she exchanged the total amount of marks for dollars at an exchange rate of 0.60 dollar per mark. What was the total amount, in dollars, that she lost through the two transactions?

(A) \$20.00  
(B) \$30.00  
(C) \$35.00  
(D) \$45.00  
(E) \$55.00



8. What is the area of the circular region with center  $O$  shown in the figure above?

(A)  $100\pi$   
(B)  $900\pi$   
(C)  $1,600\pi$   
(D)  $2,500\pi$   
(E)  $4,900\pi$

9. A rectangular-shaped carpet remnant that measures  $x$  feet by  $y$  feet is priced at \$50. What is the cost of the carpet, in dollars per square yard? (9 square feet = 1 square yard)

(A)  $50xy$   
(B)  $450xy$   
(C)  $\frac{xy}{9}$   
(D)  $\frac{xy}{50}$   
(E)  $\frac{450}{xy}$

10. In a certain voting district, 40 percent of registered voters live in Town  $A$  and the rest live in Town  $B$ . In the last election, 70 percent of the registered voters from Town  $A$  voted. If equal numbers of registered voters from both towns voted, approximately what percent of the registered voters from Town  $B$  voted?

(A) 72%  
(B) 47%  
(C) 42%  
(D) 34%  
(E) 28%

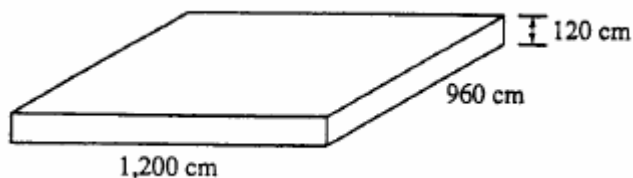
11. Which of the following is equivalent to  $(2^3)(3^4)(7) + (2^2)(3^5)(5) + (2^4)(3^3)(11)$ ?

(A)  $(2^2)(3^3)[(2)(3)(7) + (3^2)(5) + (2^2)(11)]$   
(B)  $(2^2)(3^4)[7 + (3)(5) + 11]$   
(C)  $(2)(3)[7 + 5 + 11]$   
(D)  $(2)(3^3)[(2)(3)(7) + (3^2)(5) + (2^2)(11)]$   
(E)  $(2)(3^4)[7 + (2)(3)(5) + 11]$

12. A mixture of nuts is to contain 3 parts cashews to 6 parts almonds to 7 parts walnuts by weight. How many pounds of almonds will be needed to make 5 pounds of the mixture?

(A)  $\frac{3}{8}$   
(B)  $\frac{8}{15}$   
(C)  $1\frac{1}{5}$   
(D)  $1\frac{2}{3}$   
(E)  $1\frac{7}{8}$

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13. The figure above represents a rectangular tank. How many cubic centimeters of water are in the tank when the water level is 10 centimeters below the top of the tank?

(A) 12,672,000  
 (B) 13,824,000  
 (C) 126,720,000  
 (D) 138,240,000  
 (E) 1,267,200,000

14. If  $5 - \frac{6}{x} = x$ , then  $x$  has how many possible values?

(A) None  
 (B) One  
 (C) Two  
 (D) n A finite number greater than two  
 (E) An infinite number

15. If  $[x]$  is the greatest integer less than or equal to  $x$ , what is the value of  $[-1.6] + [3.4] + [2.7]$ ?

(A) 3  
 (B) 4  
 (C) 5  
 (D) 6  
 (E) 7

16. In year  $Y$  imported machine tools accounted for 25 percent of total machine-tool sales in the United States, and Japanese imports accounted for 45 percent of the sales of imported machine tools. If the total sales of machine tools imported from Japan that year was  $x$  billion dollars, then the total sales of all machine tools in the United States was how many billion dollars?

(A)  $\frac{9x}{80}$   
 (B)  $\frac{13x}{20}$   
 (C)  $\frac{80}{9x}$   
 (D)  $\frac{20x}{13}$   
 (E)  $\frac{80x}{9}$

## S T O P

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## ANSWER KEY – Test Code 42

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