

SECTION 3
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. $\sqrt{784} =$
(A) 28
(B) 32
(C) 38
(D) 56
(E) 112
2. A total of x tourists were transported by bus to a certain museum. If there were y tourists on each bus, which of the following expresses the number of buses used?
(A) xy
(B) $\frac{x}{y}$
(C) $\frac{y}{x}$
(D) $x - y$
(E) y^x
3. If n is an integer, which of the following must be even?
(A) $n + 1$
(B) $n + 2$
(C) $2n$
(D) $2n + 1$
(E) n^2
4. $\frac{1}{0.75-1} =$
(A) -4
(B) -0.25
(C) 0.25
(D) 0.75
(E) 4
5. Sixty percent of the members of a study group are women, and 45 percent of those women are lawyers. If one member of the study group is to be selected at random, what is the probability that the member selected is a woman lawyer?
(A) 0.10
(B) 0.15
(C) 0.27
(D) 0.33
(E) 0.45
6. The dimensions of a rectangular floor are 16 feet by 20 feet. When a rectangular rug is placed on the floor, a strip of floor 3 feet wide is exposed on all sides. What are the dimensions of the rug, in feet?
(A) 10 by 14
(B) 10 by 17
(C) 13 by 14
(D) 13 by 17
(E) 14 by 16

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7. Harry started a 6-mile hike with a full 10-cup canteen of water and finished the hike in 2 hours with 1 cup of water remaining in the canteen. If the canteen leaked at the rate of 1 cup per hour and Harry drank 3 cups of water during the last mile, how many cups did he drink per mile during the first 5 miles of the hike?
- (A) $\frac{4}{5}$
 (B) $\frac{5}{6}$
 (C) 1
 (D) $\frac{6}{5}$
 (E) $\frac{5}{4}$
8. The original retail price of an appliance was 60 percent more than its wholesale cost. If the appliance was actually sold for 20 percent less than the original retail price, then it was sold for what percent more than its wholesale cost?
- (A) 20%
 (B) 28%
 (C) 36%
 (D) 40%
 (E) 42%
9. If y is an integer, then the least possible value of $|23 - 5y|$ is
- (A) 1
 (B) 2
 (C) 3
 (D) 4
 (E) 5
11. If the sum of two positive integers is 24 and the difference of their squares is 48, what is the product of the two integers?
- (A) 108
 (B) 119
 (C) 128
 (D) 135
 (E) 143
12. The volume of a sphere with radius r is $\frac{4}{3}\pi r^3$ and the surface area is $4\pi r^2$. If a spherical balloon has a volume of 972π cubic centimeters, what is the surface area of the balloon in square centimeters?
- (A) 324
 (B) 729
 (C) 243π
 (D) 324π
 (E) 729π
13. On a certain scale of intensity, each increment of 10 in magnitude represents a tenfold increase in intensity. On this scale, an intensity corresponding to a magnitude of 165 is how many times an intensity corresponding to a magnitude of 125?
- (A) 40
 (B) 100
 (C) 400
 (D) 1,000
 (E) 10,000

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10. The president of a country and 4 other dignitaries are scheduled to sit in a row on the 5 chairs represented above. If the president must sit in the center chair, how many different seating arrangements are possible for the 5 people?
- (A) 4
 (B) 5
 (C) 20
 (D) 24
 (E) 120

14. If the perimeter of square region S and the perimeter of circular region C are equal, then the ratio of the area of S to the area of C is closest to
- (A) $\frac{3}{2}$
(B) $\frac{4}{3}$
(C) $\frac{3}{4}$
(D) $\frac{2}{3}$
(E) $\frac{1}{2}$
15. On a Saturday night, each of the rooms at a certain motel was rented for either \$40 or \$60. If 10 of the rooms that were rented for \$60 had instead been rented for \$40, then the total rent the motel charged for that night would have been reduced by 25 percent. What was the total rent the motel actually charged for that night?
- (A) \$600
(B) \$800
(C) \$1,000
(D) \$1,600
(E) \$2,400
16. If n and k are integers whose product is 400, which of the following statements must be true?
- (A) $n + k > 0$
(B) $n \neq k$
(C) Either n or k is a multiple of 10.
(D) If n is even, then k is odd.
(E) If n is odd, then k is even.

SECTION 5
Time—25 minutes
16 Questions

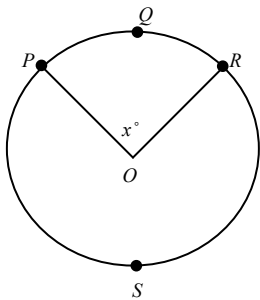
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1. If x is negative, which of the following must be positive?
I. x^2
II. $(-1)x$
III. $\frac{1}{x}$
(A) I only
(B) I and II only
(C) I and III only
(D) II and III only
(E) I, II and III
2. The employees of Smith Enterprises received wage increases ranging from 30 cents to $87\frac{1}{2}$ cents per hour. What was the minimum wage increase for a 40-hour week?
(A) \$12.00
(B) \$23.00
(C) \$34.80
(D) \$35.00
(E) \$35.20
4. The sum of 3 hours 45 minutes and 2 hours 55 minutes is approximately what percent of a day?
(A) 14%
(B) 16%
(C) 24%
(D) 28%
(E) 72%
5. A salesman makes a 20 percent commission on the selling price of each set of encyclopedias he sells. If he sells 12 identical sets of encyclopedias and makes \$1,800 in commissions, what is the selling price of each set?
(A) \$300
(B) \$600
(C) \$750
(D) \$900
(E) \$1,080

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3. If O is the center of the circle above and the length of arc RSP is twice the length of arc PQR , then x equals
(A) 60
(B) 100
(C) 120
(D) 150
(E) 240

6. If $x < 12$, then it must be true that
- (A) $-x < -12$
 (B) $-x - 2 < 14$
 (C) $-x + 2 < -10$
 (D) $x + 2 < 10$
 (E) $x - 2 < 11$
7. The 10 households on a certain street have household incomes that range from \$34,000 to \$150,000 and an average (arithmetic mean) household income of \$60,000. If the household with the highest income and the one with the lowest income are excluded, what is the average household income for the remaining 8 households?
- (A) \$41,000
 (B) \$47,000
 (C) \$52,000
 (D) \$61,000
 (E) \$75,000
8. If $x = y + 4$ and $x = 20 - y$, then $x^2 - y^2 =$
- (A) 16
 (B) 80
 (C) 144
 (D) 256
 (E) 384
9. On level farmland, two runners leave at the same time from the intersection of two country roads. One runner jogs due north at a constant rate of 8 miles per hour while the second runner jogs due east at a constant rate that is 4 miles per hour faster than the first runner's rate. How far apart, to the nearest mile, will they be after $\frac{1}{2}$ hour?
- (A) 6
 (B) 7
 (C) 8
 (D) 12
 (E) 14
10. A square playground has the same area as a rectangular playground that is 30 meters longer but 20 meters narrower. What is the length, in meters, of a side of the square playground?
- (A) $10\sqrt{5}$
 (B) $10\sqrt{6}$
 (C) 25
 (D) 50
 (E) 60
11. The price of a dress was first discounted by a certain percent and later by 25 percent of the discounted price. If these two discounts are equivalent to a single discount of 40 percent of the original price, what was the first discount?
- (A) 10%
 (B) 15%
 (C) 20%
 (D) 30%
 (E) 65%
12. If it is assumed that each of the n production workers in a factory assembles one instrument every t minutes, how many instruments does the factory assemble in 7.5 hours of production?
- (A) $\frac{450n}{t}$
 (B) $\frac{450t}{n}$
 (C) $450nt$
 (D) $\frac{7.5tn}{60}$
 (E) $\frac{7.5n}{60t}$
13. What is the difference between the sixth and the fifth terms of the sequence 2, 4, 7, ... whose n th term is $n + 2^{n-1}$?
- (A) 2
 (B) 3
 (C) 6
 (D) 16
 (E) 17
14. Which of the following could be the sum of the reciprocals of two different prime numbers?
- (A) $\frac{7}{13}$
 (B) $\frac{10}{21}$
 (C) $\frac{11}{30}$
 (D) $\frac{23}{50}$
 (E) $\frac{19}{77}$

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15. The rear wheels of a car crossed a certain line 0.5 second after the front wheels crossed the same line. If the centers of the front and rear wheels are 20 feet apart and the car traveled in a straight line at a constant speed, which of the following gives the speed of the car in miles per hour? (5,280 feet = 1 mile).
- (A) $\left(\frac{20}{5,280}\right)\left(\frac{60^2}{0.5}\right)$
(B) $\left(\frac{20}{5,280}\right)\left(\frac{60}{0.5}\right)$
(C) $\left(\frac{20}{5,280}\right)\left(\frac{0.5}{60^2}\right)$
(D) $\frac{(20)(5,280)}{(60^2)(0.5)}$
(E) $\frac{(20)(5,280)}{(60)(0.5)}$
16. Working alone, a small pump takes twice as long as a large pump takes to fill an empty tank. Working together at their respective constant rates, the pumps can fill the tank in 6 hours. How many hours would it take the small pump to fill the tank working alone?
- (A) 8
(B) 9
(C) 12
(D) 15
(E) 18

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.

ANSWER KEY – Test Code 48

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