- Se possível imprima o arquivo e resolva os exercícios nele mesmo.
- Faça de conta que é uma prova.
- Quando acabar o tempo proposto assinale em que questão estava e continue fazendo como se tivesse mais tempo
- Corrija
- Volte para as que errou SEM ALTERAR nada do que foi feito originalmente e tente descobrir o erro. Se quiser refaça ao lado, sem apagar nada do original.
- Envie por email ou whatsapp foto em baixa resolução ou pdf de todas as anotações que precisou fazer.
- Não precisa fazer as 3 seções seguidas. Se quiser pode fazer em 3 momentos diferentes.

### **DATA SUFFICIENCY**

# Time - 30 minutes 22 Questions

<u>Directions</u>: Each of the data sufficiency problems below consists of a question and two statements, labeled (1) and (2). In which certain data are given. You have to decide whether the data given in the statements are <u>sufficient</u> for answering the question. Using the data given in the statements <u>plus</u> your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of <u>counterclockwise</u>), you are to fill in oval.

- A if statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked;
- B if statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked;
- C if BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient;
- D if EACH statement ALONE is sufficient to answer the question asked;
- E is statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Numbers: All numbers used are real numbers.

<u>Figures</u>: A figure in a data sufficiency problem will conform to the information given in the question, but will not necessarily conform to the additional information given in statements (1) and (2).

You may assume that lines shown as straight are straight and that angle measures are greater than zero.

You may assume that the positions of points, angles, regions, etc., exist in the order shown.

All figures lie in a plane unless otherwise indicated.

#### Example:

In  $\triangle PQR$ , what is the value of x?

(1) 
$$PQ = PR$$
  
(2)  $y = 40$ 



Explanation: According to statement (1), PQ = PR; therefore,  $\Delta PQR$  is isosceles and y = z. Since x + y + z = 180, x + 2y = 180. Since statement (1) does not give a value for y, you cannot answer the question using statement (1) by itself. According to statement (2), y = 40; therefore, x + z = 140. Since statement (2) does not give a value for z, you cannot answer the question using statement (2) by itself. Using both statements together, you can find y and z; therefore, you can find x, and the answer to the problem is C.

- 1. For a certain bottle and cork, what is the price of the cork ?
  - (1) The combined price of the bottle and the cork is 95 cents.
  - (2) The price of the bottle is 75 cents more than the price of the cork.
- 2. Last year an employee received a gross annual salary of \$18,000, which was paid in equal paychecks throughout the year. What was the gross salary received in each of the paychecks?
  - (1) The employee received a total of 24 paychecks during the year.
  - (2) The employee received a paycheck twice a month each month during the year.
- 3. What was Bill's average (arithmetic mean) grade for all of his courses ?
  - (1) His grade in social studies was 75, and his grade in science was 75.
  - (2) His grade in mathematics was 95.
- 4. If S is a set of four numbers w, x, y and z, is the range of the numbers in S greater than 2?
  - (1) w-z > 2(2) z is the least number in S.
- 5. A regular garden that is 10 feet long and 5 feet wide is to be covered with a layer of mulch 0.5 foot deep. At which store, K or L, will the cost of the necessary amount of mulch be less ?
  - (1) Store K sells mulch only in bags, each of which costs \$7 and contains 6.25 cubic feet of mulch.
  - (2) Store L sells mulch only in bags, each of which costs \$40 and contains 25 cubic feet of mulch.
- 6. If  $S = \{2,3,x,y\}$ , what is the value of x + y?
  - (1) x and y are prime numbers.
  - (2) 3, x, and y are consecutive odd integers in ascending order.
- 7. Each person on a committee with 40 members voted for exactly one of 3 candidates, F, G, or H. Did Candidate F receive the most votes from the 40 votes cast ?
  - (1) Candidate F received 11 of the votes.
  - (2) Candidate H received 14 of the votes.

- 8. Claire paid a total of \$1.60 for stamps, some of which cost \$0.20 each, and the rest of which cost \$0.15 each. How many 20-cent stamps did Claire buy?
  - (1) Claire bought exactly 9 stamps.
  - (2) The number of 20-cent stamps Claire bought was 1 more than the number of 15-cent stamps she bought.
- 9. If Ruth began a job and worked continuously until she finished, at what time of day did she finish the job ?
  - (1) She started the job at 8:15 a. m. and at noon of the same day she had worked exactly half of the time that it took her to do the whole job.
  - (2) She was finished exactly 7  $\frac{1}{2}$  hours after she had started.
- 10. Of the 66 people in a certain auditorium, at most 6 people have their birthdays in any one given month. Does at least one person in the auditorium have a birthday in January?
  - (1) More of the people in the auditorium have their birthday in February than in March.
  - (2) Five of the people in the auditorium have their birthday in March.
- 11. Is x an even integer ?
  - (1) x is the square of an integer.
  - (2) x is the cube of an integer.
- 12. If John is exactly 4 years older than Bill, how old is John ?
  - (1) Exactly 9 years ago John was 5 times as old as Bill was then.
  - (2) Bill is more than 9 years old.
- 13. Before play-offs, a certain team had won 80 percent of its games. After play-offs, what percent of all its games had the team won ?
  - (1) The team competed in 4 play-off games.
  - (2) The team won all of its play-off games.
- 14. If Juan had a doctor's appointment on a certain day, was the appointment on a Wednesday?
  - (1) Exactly 60 hours before the appointment, it was Monday.
  - (2) The appointment was between 1:00 p.m. and 9:00 p.m.

- 15. Store S sold a total of 90 copies of a certain book during the seven days of last week, and it sold different number of copies on any two of the days. If for the seven days Store S sold the greatest number of copies on Saturday and the second greatest number of copies on Friday, did Store S sell more than 11 copies on Friday?
  - (1) Last week Store S sold 8 copies of the book on Thursday
  - (2) Last week Store S sold 38 copies of the book on Saturday
- 16. The cost to charter a certain airplane is x dollars. If the 25 members of a club chartered the plane and shared the cost equally, what was the cost per member ?
  - (1) If there had been 5 more members and all 30 had shared the cost equally, the cost per member would have been \$40 less.
  - (2) The cost per member was 10 percent less than the cost per person on a regularly scheduled flight.
- 17. The participants in a race consisted of 3 teams with 3 runners on each team. A team was awarded 6 n points if one of its runners finished in *n*th place, where  $1 \le n \le 5$ . If all of the runners finished the race and if there were no ties, was each team awarded at least one point?
  - (1) No team was awarded more than a total of 6 points.
  - (2) No pair of teammates finished in consecutive places among the top five places.
- 18. Bowls *X* and *Y* each contained exactly 2 jelly beans, each of which was either red or black. One of the jelly beans in bowl *X* was exchanged with one of the jelly beans in bowl *Y*. After the exchange, were both of the jelly beans in bowl *X* black ?
  - (1) Before the exchange, bowl *X* contained 2 black jelly beans.
  - (2) After the exchange, bowl *Y* contained 1 jelly bean of each color.
- 19. In a certain year the United Nations total expenditure were \$1.6 billion. Of this amount, 67.8 percent was paid by the 6 highest-contributing countries, and the balance was paid by the remaining 153 countries. Was Country X among the 6 highest-contributing countries?
  - (1)56 percent of the total expenditures was paid by the 4 highest-contributing countries, each of which paid more than Country X.
  - (2) Country X paid 4.8 percent of the total expenditures



- 20. In the figure above, line *AC* represents a seesaw that is touching level ground at point *A*. If *B* is the midpoint of *AC*, how far above the ground is point *C* ?
  - (1) x = 30
  - (2) Point *B* is 5 feet above the ground.
- 21. If  $\Box$  represents a digit in the 7-digit number 3,62  $\Box$ , 215, what is the value of  $\Box$ ?
  - (1) The sum of the 7 digits is equal to 4 times an integer.
  - (2) The missing digit is different from any of the other digits in the number.
- 22. Last Tuesday a trucker paid \$155.76, including 10 percent state and federal taxes, for diesel fuel. What was the price per gallon for the fuel if the taxes are excluded?
  - (1) The trucker paid \$0.118 per gallon in state and federal taxes on the fuel last Tuesday.
  - (2) The trucker purchased 120 gallons of the fuel last Tuesday.

### RESPOSTAS

### DATA SUFFICIENCY

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

### **PROBLEM SOLVING 1**

#### 30 Minutes

#### 20 Questions

<u>Directions</u>: Is 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.

<u>Figures</u>: 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.

- 1. What is the average (arithmetic mean) of the numbers 15, 16, 17, 18, and 19?
  - (A) 14.2
  - (B) 16.5
  - (C) 17
  - (D) 17.5
  - (E) 18
- 2. Kathy bought 4 times as many shares in Company X as Carl, and Carl bought 3 times as many shares in the same company as Tom. Which of the following is the ratio of the number of shares bought by Kathy to the number of shares bought by Tom?

(A)  $\frac{3}{4}$ (B)  $\frac{4}{3}$ (C)  $\frac{3}{1}$ (D)  $\frac{4}{1}$ (E)  $\frac{12}{1}$ 

- 3. Of the following, which is closest to  $\frac{0.15x495}{9.97}$ ?
  - (A) 7.5
  - (B) 15
  - (C) 75
  - (D) 150
  - (E) 750

- 4. A manager has \$6,000 budgeted for raises for 4 full-time and 2 part-time employees. Each of the full-time employees receives the same raise, which is twice the raise that each of the part-time employees receives. What is the amount of the raise that each full-time employee receives?
  - (A) \$750
  - (B) \$1,000
  - (C) \$1,200
  - (D) \$1,500
  - (E) \$3,000

5. 
$$x^{2} - \left(\frac{x}{2}\right)^{2}$$
  
(A)  $x^{2} - x$   
(B)  $\frac{x^{2}}{4}$   
(C)  $\frac{x^{2}}{2}$   
(D)  $\frac{3x^{2}}{4}$   
(E)  $\frac{3x^{2}}{2}$ 

- 6. A hospital pharmacy charges \$0.40 per fluidram of a certain medicine but allows a discount of 15 percent to Medicare patients. How much should the pharmacy charge a Medicare patient for 3 fluidounces of the medicine? (128 fluidrams = 16 fluidounces)
  - (A) \$9.60
  - (B) \$8.16
  - (C) \$3.20
  - (D) \$2.72
  - (E) \$1.02
- 7.  $(-1)^2 (-1)^3 =$ 
  - (A) -2
  - (B) -1
  - (C) 0
  - (D) 1
  - (E) 2
- 8. At a certain bowling alley, it costs \$0.50 to rent bowling shoes for the day and \$1.25 to bowl 1 game. If a person has \$12.80 and must rent shoes. What is the greatest number of complete games that person can bowl in one day?
  - (A) 7
  - (B) 8
  - (C) 9
  - (D) 10
  - (E) 11

- 9. If  $\frac{x}{y} = 2$ , then  $\frac{x y}{x} =$ (A) -1 (B)  $-\frac{1}{2}$ (C)  $\frac{1}{2}$ (D) 1
  - (E) 1 (E) 2
- 10. If each photocopy of a manuscript costs 4 cents per page, what is the cost, in cents, to reproduce x copies of an x-page manuscript?
  - (A) 4x
  - (B) 16x
  - (C) x<sup>2</sup>
  - (D) 4x<sup>2</sup>
  - (E) 16x<sup>2</sup>
- 11. Ken left a job paying \$75,000 per year to accept a sales job paying \$45,000 per year plus 15 percent commission. If each of his sales is for \$750, what is the least number of sales he must make per year if he is not to lose money because of the change?
  - (A) 40
  - (B) 200
  - (C) 266
  - (D) 267
  - (E) 600

	500	1,000	1,500	2,000
Present	\$24.00	\$41.00	\$57.00	\$73.00
Proposed	\$26.00	\$45.00	\$62.00	\$79.00

#### MONTHLY KILOWATT-HOURS

- 12. The table above shows present rates and proposed rates for electricity for residential customers. For which of the monthly kilowatt-hours shown would the proposed rate be the greatest percent increase over the present rate?
  - (A) 500
  - (B) 1,000
  - (C) 1,500
  - (D) 2,000
  - (E) Each of the percent increases is the same.

- 13. If a, b, and c are three consecutive odd integers such that 10 < a < b < c < 20 and if b and c are prime numbers, what is the value of a + b?
  - (A) 24
  - (B) 28
  - (C) 30
  - (D) 32
  - (E) 36
- 14. Of a group of people surveyed in a political poll, 60 percent said that they would vote for candidate R. Of those who said they would vote for R, 90 percent actually voted for R, and of those who did not say that they would vote for R, 5 percent actually voted for R. What percent of the group voted for R?
  - (A) 56%
  - (B) 59%
  - (C) 62%
  - (D) 65%
  - (E) 74%

15. If 
$$r = 1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27}$$
 and  $s = 1 + \frac{1}{3}r$ , then s exceeds r by  
(A)  $\frac{1}{3}$   
(B)  $\frac{1}{6}$   
(C)  $\frac{1}{9}$   
(D)  $\frac{1}{27}$   
(E)  $\frac{1}{81}$ 

16. 
$$\frac{0.025 \times \frac{15}{2} \times 48}{5 \times 0.0024 \times \frac{3}{4}} =$$
(A) 0.1
(B) 0.2
(C) 100
(D) 200
(E) 1,000

- 17. A student responded to all of the 22 questions on a test and received a score of 63.5. If the scores were derived by adding 3.5 points for each correct answer and deducting 1 point for each incorrect answer, how many questions did the student answer <u>incorrectly</u>?
  - (A) 3
  - (B) 4
  - (C) 15
  - (D) 18
  - (E) 20



- 18. The figure above represents a rectangular parking lot that is 30 meters by 40 meters and an attached semicircular driveway that has an outer radius of 20 meters and an inner radius of 10 meters. If the shaded region is not included, what is the area, in square meters, of the lot and driveway?
  - (A)  $1,350 \pi$
  - (B)  $1,200 + 400 \pi$
  - (C)  $1,200 + 300 \pi$
  - (D)  $1,200 + 1,200 \pi$
  - (E)  $1,200 + 150 \pi$
- 19. One-fifth of the light switches produced by a certain factory are defective. Four-fifths of the defective switches are rejected and  $\frac{1}{20}$  of the nondefective switches are rejected by mistake. If all the switches not rejected are sold, what percent of the switches sold by the factory are defective?
  - (A) 4%
  - (B) 5%
  - (C) 6.25%
  - (D) 11%
  - (E) 16%

20. Running at their respective constant rates, machine X takes 2 days longer to produce w widgets than machine Y. At these rates, if the two machines together produce 5w/4 widgets in 3 days, how many days would it take Machine X alone to produce 2w widgets?

(A)4 (B)6 (C)8 (D)10 (E)12

### RESPOSTAS

### **PROBLEM SOLVING 1**

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

### **PROBLEM SOLVING 2**

45 Minutes

21 Questions

<u>Directions</u>: Is 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.

<u>Figures</u>: 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.

1. Working alone, Sumio can mow a certain field in 5 hours. Yoko takes only 3 hours to mow the same field. When the two work together, they are paid \$16 an hour. If they share in proportion to the amount of work they do, what should Yoko's hourly fee be?

(A) \$6.00
(B) \$8.00
(C) \$9.00
(D) \$10.00
(E) \$12.00

- 2. A car traveled 75% of the way from town A to town B at an average speed of 50mph. The car travels at an average speed of S mph for the remaining part of the trip. The average speed for the entire trip was 40 mph. What's S?
- (A)10
- (B) 20
- (C) 25
- (D)30
- (E) 37.5
- 3. Bob bought shares of stock, which he sold for \$96 each. If he had a profit of 20 percent on the sale of one of the shares but a loss of 20 percent on the sale of the other share, then on the sale of both shares combined Bobby had

(A) a profit of \$10
(B) a profit of \$8
(C) a loss of \$8
(D) a loss of \$10
(E) neither a profit nor a loss

- 4. If a, b, and c are constants, a > b > c, and  $x^3 x = (x a) (x b)(x c)$  for all numbers x, what is the value of b?
- (A)-3
- **(B)**-1
- (C)0
- (D)1
- (E) 3
- 5. A store has a parking lot which contains 70 parking spaces. Each row in the parking contains the same number of parking spaces. The store has bought additional property in order to build an addition to the store. When the addition is built, 2 parking spaces will be lost from each row; however 4 more rows will be added to the parking lot. After the addition is built, the parking lot will still have 70 parking spaces, and each row will contain the same number of parking spaces as every other row. How many rows were in the parking lot before the addition was built?
- (A) 5
- (B) 6
- (C) 7
- (D) 10
- (E) 14
- 6. In the function P (t) =  $-t^2 + 9t$ , P(t) represents the volume of water in a tank t hours after it started filling. If the tank started filling at 2:00 PM, at what time will it reach maximum volume?
- (A) 3:00 PM
- (B) 4:30 PM
- (C) 6:30 PM
- (D)9:00 PM
- (E) 10:30 PM
- 7. The domain of the function  $f(x) = \frac{\sqrt{x-1}}{x+1}$  is the set of all real numbers that are
- (A) Greater than 1
- (B) Greater than or equal to 1
- (C) Not equal to -1
- (D) Less than or equal to 1
- (E) Less than 1

8. Of the 200 students at College T majoring in one or more of the science, 130 are majoring in chemistry and 150 are majoring in biology. If at least 30 of the students are not majoring in either chemistry or biology, then the number of students majoring in both chemistry and biology could be any number from

(A)20 to 50 (B)40 to 70 (C)50 to 130 (D)110 to 130 (E) 110 to 150

- 9. Cottages at a resort are rented for half the summer price in each of the 3 spring months and one-third the summer price in each of the 6 fall and winter months. If each cottage brings in a total of \$3,861 when rented for each of the 12 months of the year, what is the monthly rent for each of the 3 summer months?
- (A)\$297
- (B) \$594
- (C) \$702
- (D)\$858
- (E) \$1,782
- 10. Which of the following is the set of all integers y for which  $6y^2 + 9y + 17$  is an even integer?
- (A) The integers
- (B) The nonzero integers
- (C) The nonzero, even integers
- (D) The even integers
- (E) The odd integers
- 11. If *n* is a positive integer and  $n^2$  is divisible by 108, then the largest positive integer that must divide *n* is
  - (A)6
  - (B) 12
  - (C) 18
  - (D)36
  - (E) 54
- 12. In a class of 10 students, a group of 4 will be selected for a trip. How many different groups are possible, if 2 of those 10 students are a married couple and will only travel together?
  - (A) 98
  - (B) 126
  - (C) 115
  - (D) 165
  - (E) 122

13. The board of the Club X consists of 7 men and 5 women. In addition, there are 4 alternates, 2 women and 2 men. If a member of board is selected at random to be replaced by one of the alternates, also selected at random, what is the probability that the number of men on the board will increase?

(A) 5/24(B) 7/24

- (C) 5/12
- (D) <sup>1</sup>/<sub>2</sub> (E) 7/12

Age Category (in years)	Number of Employees
Less than 20	29
20 - 29	58
30 - 39	36
40 - 49	21
50 - 59	10
60 - 69	5
70 and over	2

14. The table above gives the age categories of the 161 employees at Company X and the number of employees in each category. According to the table, if m is the median age, in years, of the employees at Company X, then m must satisfy which of the following?

- A)  $20 \le m \le 29$ B)  $25 \le m \le 34$ C)  $30 \le m \le 39$ D)  $35 \le m \le 44$ E)  $40 \le m \le 49$
- 15. In the sequence  $x_0, x_1, x_2, ..., x_n$ , each term from  $x_1$  to  $x_k$  is 3 greater than the previous term, and each term from  $x_{k+1}$  to  $x_n$  is 3 less than the previous term, where n and k are positive integers and k < n. If  $x_0 = x_n = 0$  and if  $x_k = 15$ , what is the value of n?
- (A)5 (B)6 (C)9
- (D)10
- (E) 15
- 16. If k is an even integer and p and r are odd integers, which of the following CANNOT be an integer?
- (A) r/k(B) k/p(C) p/r(D) kp/r
- (E)  $\frac{kr}{p}$

- 17. Today Al is 3 times as old as Pat. In 13 years, Al will be one year less than twice as old as Pat will be then. How many years old is Al today?
  - (A) 12(B) 33(C) 36
  - (D) 42
  - (E) 49
- 18. When the integer n is divided by 17, the quotient is x and the remainder is 5. When n is divided by 23, the quotient is y and the remainder is 14. Which of the following is true?
  - (A) 23x + 17y = 19(B) 17x - 23y = 9
  - (C) 17x + 23y = 19
  - (D) 14x + 5y = 6
  - (E) 5x 14y = -6
- 19. Which of the following is equal to  $\frac{351}{558}$ ?

(A)	$\frac{7}{11}$
(B)	$\frac{39}{62}$
(C)	$\frac{19}{31}$
(D)	$\frac{117}{196}$
(E)	$\frac{107}{186}$

- 20. Three types of pencils, J, K, and L, cost \$0.05, \$0.10, and \$0.25 each respectively. If a box of 32 of these pencils costs a total of \$3.40 and if there are twice as many K pencils as L pencils in the box, how many J pencils are in the box?
  - (A) 6
    (B) 12
    (C) 14
  - (D) 18
  - (E) 20
- 21. Forty percent of the rats included in an experiment were male rats. If some of the rats died during the experiment and 30% of the rats that died were male rats, what was the ratio of the death rate among the male rats to the death rate among the female rats?
  - (A)  $\frac{9}{14}$
  - (B) <sup>3</sup>⁄<sub>4</sub>
  - $(C) \frac{9}{11}$
  - (D)  $\frac{6}{7}$
  - (E)  $^{7}/_{8}$

### RESPOSTAS

## **PROBLEM SOLVING 2**

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