1. How many numbers do the sets \( S \) and \( T \) have in common?
   1) \( S \) is a set of 10 numbers.
   2) \( T \) is a set of 100 numbers.

2. In the figure above, if line \( l_1 \) is parallel to line \( l_2 \) what is the value of \( x \)?
   1) \( y = 50 \)
   2) \( z = 130 \)

3. NOT SCORED

4. If Pat saved $600 of his earnings last month how much did Pat earn last month?
   1) Pat spent \( \frac{1}{2} \) of his earnings last month for living expenses and saved \( \frac{1}{3} \) of the remainder.
   2) Of his earnings last month, Pat paid twice as much in taxes as he saved.

5. The purchase price of Beth's new car, including the sales tax, is $8,000. If she finances the car, making a down payment of $2,000 and paying off the rest in equal monthly installments, what will be the total cost of the car, including sales tax and financing?
   1) The installments are to be $200 per month.
   2) The installments will extend over a period of exactly three years.

6. If \( y \ldots 0 \), is \( \frac{x}{y} = \frac{1}{2} \)?
   1) \( x \) is 50 percent of \( y \).
   2) \( 0.1x = 0.05y \).

7. If \( n \) is an integer, is \( n \) even?
   1) \( n^2 - 1 \) is an odd integer.
   2) \( 3n + 4 \) is an even integer.

8. If \( x \), \( y \), \( p \) and \( q \) are positive, is \( x \geq y \)?
   1) \( px = p \)
   2) \( qy = q \)
   3) \( xy = p \)

9. If \( p_1 \) and \( p_2 \) are the populations and \( r_1 \) and \( r_2 \) are the numbers of representatives of District 1 and district 2, respectively, the ratio of the population to the number of representatives is greater for which of the two districts?
   1) \( p_1 > p_2 \)
   2) \( r_2 > r_1 \)

10. What digit does \( t \) represent in the decimal 0.073?
   1) \( t < 5 \)
   2) \( 0.073 < \frac{1}{t} \)

11. On the number line above, \( p, q, r, s \) and \( t \) are five consecutive even integers in the increasing order. What is the average (arithmetic mean) of these five integers?
   1) \( q + s = 24 \).
   2) The average (arithmetic mean) of \( q \) and \( r \) is 17.

12. What is the length in meters of a certain rectangular garden?
   1) The length of the garden is 6 meters more than twice the width.
   2) The length of the garden is 4 times the width.

13. If \( x < y \), is \( x^2 < y^2 \)?
   1) \( y > 0 \)
   2) \( x > 0 \)

14. If Fran jumps straight up off the floor and lands on her feet \( T \) seconds later, her feet will reach a maximum height of \( 1.22t^2 \) meters above the floor. On one such jump, was Fran off the floor for less than 1 second?
   1) On her jump Fran's feet reached a maximum height of 1 meter above the floor.
   2) On her jump Fran spent more than \( \frac{1}{4} \) second ascending.

15. If \( [x] \) denotes the greatest integer less than or equal to \( x \), is \( [x] = 0 \)?
   1) \( 5x + 3 = 3 + 2x \)
   2) \( 0 < x < 1 \)

16. During a 6-day local trade show, the least number of people registered, in a single day was 80. Was the average (arithmetic mean) number of people registered per day for the 6 days greater than 90?
   1) For the 4 days with the greatest number of people registered, the average (arithmetic mean) number registered per day was 100.
   2) For the 3 day with the smallest number of people registered, the average (arithmetic mean) number registered per day was 85.

17. If \( a \) and \( b \) are positive integers, what is the value of \( a + b \)?
   1) \( a = \frac{5}{8} \)
   2) The greatest common divisor of \( a \) and \( b \) is 1.
18. In the xy plane, does the point (4,12) lie on line k?
   1) The point (1, 7) lies on line k
   2) The point (-2, 2) lies on line k
19. What was the total amount of revenue that a theater received from the sale of 400 tickets, some of which were sold at x percent of full price and the rest of which were sold at full price?
   1) x = 50
   2) Full price tickets sold for $20 each
20. If x, y and z are nonzero numbers is xz = 12?
   1) \( x^2yz = 12xy \)
   2) \( \frac{z}{4} = \frac{3}{x} \)
21. When a player in a certain game tossed a coin a number of times, 4 more heads than tails resulted. Heads or tails resulted each time the player tossed the coin. How many times did heads result?
   1) The player tossed the coin 24 times
   2) The player received 3 points each time heads resulted and 1 point each time tails resulted, for a total of 52 points

22. What is the area of triangular region ABC above?
   1) The product of BD and AC is 20
   2) x = 45
23. What is the value of 36,500 \((1.05)^n\)?
   1) \( n^2 - 5n + 6 = 0 \)
   2) \( n - 2 \neq 0 \)
24. A bakery opened yesterday with its daily supply of 40 dozen rolls. Half of the rolls were sold by noon, and 80 percent of the remaining rolls were sold between noon and closing time. How many dozen rolls had not been sold when the bakery closed yesterday?
   A) 1
   B) 2
   C) 3
   D) 4
   E) 5
25. What is the combined area, in square inches, of the front and back of a rectangular sheet of paper measuring \(8\frac{1}{2}\) inches by 11 inches?
   A) 38
31. It would take one machine 4 hours to complete a large production order and another machine 3 hours to complete the same order. How many hours would it take both machines, working simultaneously at their respective constant rates, to complete the order?

A) \( \frac{7}{12} \)
B) \( \frac{1}{2} \)
C) \( \frac{5}{7} \)
D) \( \frac{1}{2} \)
E) 7

32. \( R \) is the set of positive odd integers less than 50, and \( S \) is the set of the squares of the integers in \( R \). How many elements does the intersection of \( R \) and \( S \) contain?

A) None
B) Two
C) Four
D) Five
E) Seven

33. To mail a package, the rate is \( x \) cents for the first pound and \( y \) cents for each additional pound, where \( x > y \). Two packages weighing 2 pounds and 2 pounds, respectively, can be mailed separately or combined as one package. Which method is cheaper, and how much money is saved?

A) Combined, with a saving of \( x - y \) cents
B) Combined, with a saving of \( y - x \) cents
C) Combined, with a saving of \( x \) cents
D) Separately, with a saving of \( x - y \) cents
E) Separately, with a saving of \( y \) cents

34. If money is invested at \( r \)% percent interest, compounded annually, the amount of the investment will double in approximately \( \frac{70}{r} \) years. If Pat’s parents invested $5,000 in a long term bond that pays 8 percent interest, compounded annually, what will be the approximate total amount of the investment 18 years later, when Pat is ready for college?

A) $20,000
B) $15,000
C) $12,000
D) $10,000
E) $9,000

35. The circle with center \( C \) shown above is tangent to both axes. If the distance from 0 to \( C \) is equal to \( k \), what is the radius of the circle in terms of \( k \)?

A) \( k \)
B) \( \frac{k}{\sqrt{2}} \)
C) \( \frac{k}{\sqrt{3}} \)
D) \( \frac{k}{2} \)
E) \( \frac{k}{3} \)

36. On a recent trip, Cindy drove her car 290 miles, rounded to the nearest 10 miles, and used 12 gallons of gasoline, rounded to the nearest gallon. The actual number of miles per gallon that Cindy’s car got on this trip must have been between.

A) \( \frac{290}{12.5} \) and \( \frac{290}{11.5} \)
B) \( \frac{295}{12} \) and \( \frac{285}{12} \)
C) \( \frac{285}{12} \) and \( \frac{295}{12} \)
D) \( \frac{285}{12.5} \) and \( \frac{295}{12.5} \)
E) \( \frac{295}{12.5} \) and \( \frac{285}{11.5} \)

37. Which of the following inequalities is an algebraic expression for the shaded part of the number line above?

A) \( b \leq 3 \)
B) \( b > 1 \leq 5 \)
C) \( b \leq 2 \leq 3 \)
D) \( b - 1 \leq 4 \)
E) \( b + 1 \leq 4 \)

38. In an electric circuit, two resistors with resistances \( x \) and \( y \) are connected in parallel. In this case, if \( r \) is the combined resistance of these two resistors, then the reciprocal of \( r \) is equal to the sum of the reciprocals of \( x \) and \( y \). What is \( r \) in terms of \( x \) and \( y \)?

A) \( x y \)
B) \( x + y \)
C) \( \frac{1}{x + y} \)
D) \( \frac{xy}{x + y} \)
E) \( \frac{x + y}{xy} \)
39. Xavier, Yvonne and Zelda each try independently to solve a problem. If their individual probabilities for success are \( \frac{1}{4} \), \( \frac{1}{2} \), and \( \frac{5}{8} \) respectively, what is the probability that Xavier and Yvonne, but not Zelda will solve the problem?

A) \( \frac{11}{8} \)  
B) \( \frac{7}{8} \)  
C) \( \frac{9}{64} \)  
D) \( \frac{5}{64} \)  
E) \( \frac{3}{64} \)

40. What is the value of \( y \)?

1) \( y \) is an odd integer between 28 and 34.
2) \( 31 < y < 36 \).

41. The price of a television set was reduced by 25 percent. What was its original price?

1) The reduced price was $187.50
2) The original price exceeded the reduced price by more than $60.00

42. What is the remainder when the positive integer \( n \) is divided by 6?

1) \( n \) is a multiple of 5.
2) \( n \) is a multiple of 12.

43. Three friends rented a car for a week and divided the cost equally. What was the total cost of renting the car?

1) If the three friends had kept the car for a second week, they could have obtained the two-week rate, which was 1.5 times the cost of a one-week rental.
2) If a fourth friend had joined the three friends and the cost had been divided equally among the four friends, the cost to each of the original three would have been reduced by $15.

44. Is \( x > y \)?

1) \( x = y + 2 \)
2) \( \frac{x}{2} = y - 1 \)

45. Sally gave some of her candy to her friends. How many pieces of candy did she have before giving any to her friends?

1) Sally gave each friend 8 pieces of candy.
2) Sally had 7 pieces of candy left after giving candy to her friends.

46. What was Jean's insurance premium in 1995?

1) The ratio of Jean's insurance premium in 1995 to her insurance premium in 1994 was \( \frac{6}{5} \).
2) Jean's insurance premium in 1995 was 20 percent more than her insurance premium in 1994.

47. What is the average (arithmetic mean) of \( x \) and \( y \)?

1) The average of \( x \) and \( 2y \) is 10.
2) The average of \( 2x \) and \( 7y \) is 32.

48. The figure above shows the present position on a radar screen of a sweeping beam that is rotating at a constant rate in a clockwise direction. In which of the four quadrants will the beam lie 30 seconds from now?

1) In each 30 second period the beam sweeps through 360°.
2) \( r = 40 \)

49. The number of seats in the first row of an auditorium is 18 and the number of seats in each row thereafter is 2 more than in the previous row. What is the total number of seats in the Auditorium?

1) The number of rows of seats in the auditorium is 27.
2) The number of seats in the last row is 70.

50. How many books did a librarian purchase?

1) The librarian paid an average (arithmetic mean) of $15 per book for the books purchased.
2) The total sales tax on the books purchased was $7.

51. Is the integer \( n \) a multiple of 15?

1) \( n \) is a multiple of 20
2) \( n + 6 \) is a multiple of 3.

52. What is the area of a rectangular region \( R \)?

1) Each diagonal of \( R \) has length 5.
2) The Perimeter of \( R \) is 14.

53. In a certain coding scheme, each word is encoded by replacing each letter in the word with another letter. The same code is used for all words, so that the same letter replaces a given letter each time the given letter occurs. What code will result when the word TAME is encoded by this scheme?

1) When the word MAT is encoded, the result is DLX.
2) When the word TEA is encoded, the result is XRL.

54. While driving on the expressway, did Robin ever exceed the 55 miles per hour speed limit?

1) Robin drove 100 miles on the expressway.
2) Robin drove for 2 hours on the expressway.
55. The figure above shows the dimensions of an isosceles triangle in terms of $x$. What is the area of the triangle?

A) 24  
B) 30  
C) 48  
D) 60  
E) 96

56. In a certain animal population, for each of the first 3 months of life, the probability that an animal will die during that month is $\frac{1}{10}$. For a group of 200 newborn members of the population, approximately how many would be expected to survive the first 3 months of life?

A) 140  
B) 146  
C) 152  
D) 162  
E) 170

\[ y = 248 - 398x \]

51. Which of the following values of $x$ gives the greatest value of $y$ in the equation above?

A) 200  
B) 100  
C) 0.5  
D) 0  
E) -1

52. A factory has 500 workers, 15 percent of whom are women. If 50 additional workers are to be hired and all of the present workers remain, how many of the additional workers must be women in order to raise the percent of women employees to 20 percent?

A) 3  
B) 10  
C) 25  
D) 30  
E) 35

53. If $\frac{1}{x} = \frac{1}{x+1}$ then $x$ could be

A) 0  
B) -1  
C) -2  
D) -3  
E) -4

54. In a small snack shop, the average (arithmetic mean) revenue was $400 per day over a 10 day period. During this period, if the average daily revenue was $360 for the first 6 days, what was the average daily revenue for the last 4 days?

A) $420  
B) $440  
C) $450  
D) $460  
E) $480

55. A retail appliance store priced a video recorder at 20 percent above the wholesale cost of $200. If a store employee applied the 10 percent employee discount to the retail price to buy the recorder, how much did the employee pay for the recorder?

A) $198  
B) $216  
C) $220  
D) $230  
E) $240

56. A certain country had a total annual expenditure of $1.2 \times 10^{12}$ last year. If the population of the country was 240 million last year, what was the per capita expenditure?

A) $500  
B) $1,000  
C) $2,000  
D) $3,000  
E) $5,000

57. In the figure above, how many of the points on line segment PQ have co-ordinates that are both integers?

A) 5  
B) 8  
C) 10  
D) 11  
E) 20

58. What is the least number of digits (including repetitions) needed to express 10100 in decimal notation?

A) 4  
B) 100  
C) 101  
D) 1,000  
E) 1,001

59. A certain rectangular window is twice as long as it is wide. If its perimeter is 10 feet, then its dimensions in feet are

A) $198  
B) $216  
C) $220  
D) $230  
E) $240
67. The diagram above shows the various paths along which a mouse can travel from point X, where it is released, to point Y. Where it is rewarded with a food pellet. How many different paths from X to Y can the mouse take if it goes directly from X to Y without retracting any point along a path?

A) 6  
B) 7  
C) 12  
D) 14  
E) 17

68. The rectangular region above contains two circles and a semicircle, each with a radius of 7. If $\frac{22}{7}$ is used as an approximation for $\pi$, then the area of the shaded region is approximately.

A) 105  
B) 210  
C) 380  
D) 385  
E) 405

69. If the operation $\oplus$ is defined by $x \oplus y = \sqrt{xy}$ for all positive numbers x and y, then $(5 \oplus 45) \oplus 60 =$

A) 30  
B) 60  
C) 90  
D) $30\sqrt{15}$  
E) $60\sqrt{15}$

70. A bar over a sequence of digits in a decimal indicates that the sequence repeats indefinitely. What is the value of $(10.4 - 10.2)(0.0012)?$

A) 0  
B) 0.12  
C) 1.2  
D) 10  
E) 12

71. At a loading dock, each worker on the night crew loaded $\frac{3}{4}$ as many boxes as each worker on the day crew. If the night crew had $\frac{4}{5}$ as many workers as the day crew, what fraction of all the boxes loaded by the two crews did the day crew load?

A) $\frac{1}{2}$  
B) $\frac{2}{5}$  
C) $\frac{3}{5}$  
D) $\frac{4}{5}$  
E) $\frac{5}{8}$

72. $(\frac{1}{2})^{-3} (\frac{1}{4})^{-2} (\frac{1}{16})^{-1} =$

A) $(\frac{1}{2})^{-18}$  
B) $(\frac{1}{2})^{-11}$  
C) $(\frac{1}{2})^{-6}$  
D) $(\frac{1}{8})^{-11}$  
E) $(\frac{1}{8})^{-6}$

73. In a certain game, a large container is filled with red, yellow, green and blue beads worth, respectively, 7, 5, 3, and 2 points each. A number of beads are then removed from the container. If the product of the point values of the removed beads is 147.000 how many red beads were removed?

A) 5  
B) 4  
C) 3  
D) 2  
E) 0

74. Seed mixture X is 40 percent ryegrass and 60 percent bluegrass by weight. Seed mixture Y is 25 percent ryegrass and 75 percent fescue. If a mixture of X and Y contains 30 percent ryegrass, what percent of the weight of this mixture is X?

A) 10%  
B) $33 \frac{1}{3}$%  
C) 40%  
D) 50%  
E) $66 \frac{2}{3}$%
75. 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) \( y \)  
D) \( x - y \)  
E) \( y \)  

76. If \( n \) is an integer, which of the following must be even?

A) \( n + 1 \)  
B) \( n + 2 \)  
C) \( 2n \)  
D) \( 2n + 1 \)  
E) \( n^2 \)  

77. \( \frac{1}{0.75 - 1} = \)

A) \(-4\)  
B) \(-0.25\)  
C) \(0.25\)  
D) \(0.75\)  
E) \(4\)  

78. 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) \(0.45\)  

79. 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  

80. 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) \(\frac{5}{4}\)  

81. 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, than it was sold for what percent more than its wholesale cost?

A) 20\%  
B) 28\%  
C) 36\%  
D) 40\%  
E) 42\%  

82. If \( y \) is an integer, then the least possible value of \( |23 - 5y| \) is

A) 1  
B) 2  
C) 3  
D) 4  
E) 5  

83. 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  

84. 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  

85. 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 \(972\pi\) cubic centimeters, what is the surface area of the balloon in square centimeters?

A) 324  
B) 729  
C) \(243\pi\)  
D) \(324\pi\)  
E) \(729\pi\)  

86. Which of the following fractions is equal to \(0.16\)?

A) \(\frac{1}{4}\)  
B) \(\frac{4}{25}\)  
C) \(\frac{5}{8}\)  
D) \(\frac{8}{5}\)  
E) \(\frac{25}{4}\)
87. 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%

88. A salesman makes a 20 percent commission on the selling price of each set of encyclopaedias he sells. If he sells 12 identical sets of encyclopaedias and makes $1,800 in commission. What is the selling price of each set?
   A) $300  
   B) $600  
   C) $750  
   D) $900  
   E) $1,080

89. If x < 12, then it must be true that
   A) x < - 12  
   B) - x < - 12  
   C) - x - 2 < 14  
   D) x - 2 < 10  
   E) x < 21

90. 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) $41,600  
   B) $47,000  
   C) $52,000  
   D) $61,000  
   E) $75,000

91. If x = y = 4 and x = 20 - y, then x^2 - y^2 = ?
   A) 16  
   B) 80  
   C) 144  
   D) 256  
   E) 384

92. One 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 1/2 hour?
   A) 6  
   B) 7  
   C) 8  
   D) 12  
   E) 14

93. 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 one side of the square playground?
   A) \(10 \sqrt{5}\)  
   B) \(10 \sqrt{6}\)  
   C) 25  
   D) 50  
   E) 60

94. 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%

95. 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) \(450n\)  
   B) \(\frac{450}{n}\)  
   C) \(450nt\)  
   D) \(\frac{7.5nt}{60}\)  
   E) \(\frac{7.5n}{60t}\)

96. What is the difference between the sixth and the fifth terms of the sequence 2, 4, 7, ..., whose nth terms is \(n + 2^{n-1}\) ?
   A) 2  
   B) 3  
   C) 6  
   D) 16  
   E) 17

97. 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) \(\frac{19}{77}\)
98. A certain state legislature consists of 124 members, each of whom is either a Democrat or a Republican. If there are 18 more Republicans than Democrats, how many Republicans are in the legislature?

A) 44
B) 53
C) 71
D) 80
E) 106

99. A certain psychologist charges $30 more for the first hour of therapy than for each additional hour. If the total charge to a patient who receives 6 hours of therapy is $300. What is the total charge to a patient who receives only 3 hours of therapy?

A) $120
B) $135
C) $150
D) $165
E) $192

100. If \( x + y = 1 \) and \( x - y = -1 \), what is the value of \( xy \)?

A) -2
B) -1
C) 0
D) 1
E) 2

101. If \( (x^2 + 6x + 9) + 6(x + 3) + 9 = 0 \), then \( x = \)

A) -6
B) -3
C) 0
D) 3
E) 6

102. In 1982 and 1983, Company B's operating expenses were $12.0 million and $14.0 million respectively, and its revenues were $15.6 million and $18.8 million, respectively. What was the percent increase in Company B's profit (revenues minus operating expenses) from 1982 to 1983?

A) 3%
B) 16 %
C) 25%
D) 33 1/3%
E) 60%

103. If \( a \) and \( b \) are integers and \( b \neq 0 \), which of the following CANNOT equal 0?

A) \( ab \)
B) \( a - b \)
C) \( a + b \)
D) \( ab - b^2 \)
E) \( a^2 + b^2 \)

104. What are the coordinates of point B in the xy-plane above?

A) (6.12)
B) (6.28)
C) (8.20)
D) (12.20)
E) (14.28)

105. Last year 31 percent of Ace Book Company's sales revenue came from the sale of novels. Of the remaining revenue, \( \frac{1}{3} \) was from the sale of biographies. The company's revenue from the sale of novels was approximately how many times its revenue from the sale of biographies?

A) 1.3
B) 1.5
C) 2.1
D) 2.5
E) 3.1

106. Three musical tones have frequencies \( x \), \( y \), and \( z \) respectively. If \( x \), \( y \), and \( z \) are positive, \( \frac{x}{y} = \frac{y}{z} \) and \( 2x = z \). What is \( y \) in terms of \( x \)?

A) \( 2x \)
B) \( (\sqrt{2})x \)
C) \( \frac{1}{\sqrt{2}} \)
D) \( \frac{1}{2} \)
E) \( \frac{\sqrt{2}}{3} x \)

107. Of a group of draft registrants 35 percent were deferred for dependency. Of the remaining registrants, 20 percent were deferred for other reasons. The remaining 1,300 were drafted. What was the original number of registrants?

A) 1,900
B) 2,106
C) 2,500
D) 3,200
E) 18,577
108. In a class of 30 students the average on a certain test is $p$. If the teacher decides to raise each grade 10 points, what will the new average be?
   A) $p + 3$
   B) $p + 10$
   C) $p + 30$
   D) $p + 300$
   E) 10$p$

109. If $x$ is a positive number less than 10. Which of the following is least?
   A) $x - 20$
   B) $x$
   C) 0
   D) $-x$
   E) 20 - $x$

110. A computer programmer needs to print 148 documents. The documents have an average (arithmetic mean) length of 10 pages and the printer takes 15 seconds to print takes 15 seconds to print each page. Approximately how many hours will it take to print all the documents if they are printed without interruptions?
   A) $\frac{1}{2}$ hr
   B) 2 hr
   C) $2\frac{1}{2}$ hr
   D) 6 hr
   E) 24 hours

111. The figure above represents a frame: the shaded regions represent the openings in the frame. If all line segments in the figure are either horizontal or vertical and the openings are the same size, what are the dimensions of each opening?
   A) 4.5 cm by 3 cm
   B) 4.5 cm by 6.5 cm
   C) 5 cm by 5.5 cm
   D) 5 cm by 9 cm
   E) 5 cm by 11 cm

112. In the first hour of a two-hour trip, a car traveled $d$ kilometers, and in the second hour of the trip, the car traveled one-half that distance. What is the average rate at which the car traveled during the trip, in kilometers per hour?
   A) 0
   B) 1
   C) $n+1$
   D) $n+2$
   E) $n+3$

113. Jaime earned enough money by selling seashells at 25 cents each to buy several used paper back books at 55 cents each. If he spent all of the money he earned selling seashells to buy the books what is the least number of seashells he could have sold?
   A) 5
   B) 11
   C) 17
   D) 25
   E) 30

114. In a certain sequence, the first term is 1 and each successive term is 1 more than the reciprocal of the term that immediately precedes it. What is the fifth term of the sequence?
   A) $\frac{3}{5}$
   B) $\frac{5}{8}$
   C) $\frac{8}{5}$
   D) $\frac{5}{3}$
   E) $\frac{9}{2}$

115. A wildlife preserve is being planned for 3,000 rhinoceroses. The preserve is to contain a total of 10,000 acres of watering area, plus 100 acres of grazing area for each rhinoceros. If the number of rhinoceroses is expected to increase by 10 percent, how many thousand acres should the preserve have in order to provide for the increased population?
   A) 340
   B) 330
   C) 320
   D) 310
   E) 300

116. For the positive numbers $n$, $n+1$, $n+2$, $n+4$, and $n+8$, the mean is how much greater than the median?
   A) 0
   B) 1
   C) $n+1$
   D) $n+2$
   E) $n+3$
117. \( 1 < x < 2 \)  
(1) \( 0 < x \)  
(2) \( x < 3 \)

118. Water is pumped into a partially filled tank at a constant rate through an inlet pipe. At the same time, water is pumped out of the tank at a constant rate through an outlet pipe. At what rate, in gallons per minute, is the amount of water in the tank increasing?  
(1) The amount of water initially in the tank is 200 gallons.  
(2) Water is pumped into the tank at a rate of 10 gallons per minute and out of the tank at a rate of 10 gallons every \( 2\frac{1}{2} \) minutes.

119. If P, Q, and R are three distinct points, do line segments P Q and PR have the same length?  
(1) P is the midpoint of line segment QR.  
(2) Q and R lie on the same circle with center P.

120. What distance did Jane travel?  
(1) Bill traveled 40 miles in 40 minutes.  
(2) Jane traveled at the same average rate as Bill.

121. The profit from the sale of a certain appliance increases, though not proportionally, with the number of units sold. Did the profit exceed $4 million on sales of 380,000 units?  
(1) The profit exceeded $2 million on sales of 200,000 units.  
(2) The profit exceeded $5 million on sales of 350,000 units.

122. Each number in the arrangement above is obtained from the two nearest numbers in the column immediately to the left by subtracting the upper number from the lower number. What is the value of \( z \)?  
(1) \( x = 7 \)  
(2) \( t = 5 \)

123. How many people are directors of both Company K and Company R?  
(1) There were 17 directors present at a joint meeting of the directors of Company K and Company R, and no directors were absent.  
(2) Company K has 12 directors and Company R has 8 directors.

124. What is the value of \( xy - yz \)?  
(1) \( y = 2 \)  
(2) \( x - z = 5 \)

125. The length of the edging that surrounds circular garden K is \( \frac{1}{2} \) the length of the edging that surrounds circular garden G. What is the area of garden K? (Assume that the edging has negligible width.)  
(1) The area of G is \( 25\pi \) square meters.  
(2) The edging around G is 10\( \pi \) meters long.

126. If the average (arithmetic mean) of six numbers is 75, how many of the numbers are equal to 75?  
(1) None of the six numbers is less than 75.  
(2) None of the six numbers is greater than 75.

127. An employee is paid 1.5 times the regular hourly rate for each hour worked in excess of 40 hours per week, excluding Sunday, and 2 times the regular hourly rate for each hour worked on Sunday. How much was the employee paid last week?  
(1) The employee's regular hourly rate is $10.  
(2) Last week the employee worked a total of 54 hours but did not work more than 8 hours on any day.

128. If \( n \) and \( k \) are greater than zero, is \( \frac{n}{k} \) an integer?
1. \( n \) and \( k \) are both integers.
2. \( n^2 \) and \( k^2 \) are both integers.

129. At Larry's Auto Supply Store, Brand X antifreeze is sold by the gallon and Brand Y motor oil is sold by the quart. Excluding sales tax, what is the total cost for 1 gallon of Brand X antifreeze and 1 quart of Brand Y motor oil?

1. Excluding sales tax, the total cost for 6 gallons of Brand X antifreeze and 10 quarts of Brand Y motor oil is $58. (There is no quantity discount.)
2. Excluding sales tax, the total cost for 4 gallons of Brand X antifreeze and 12 quarts of Brand Y motor oil is $44. (There is no quantity discount.)

130. If \( x \) is an integer, is \( x \mid x \mid < 2^k \)?
1. \( x < 0 \)
2. \( x = 10 \)

131. By what percent did the median household income in country \( Y \) decrease from 1970 to 1980?

1. In 1970 the median household income in Country Y was \( \frac{2}{3} \) of the median household income in Country X.
2. In 1980 the median household income in Country Y was \( \frac{1}{2} \) of the median household income in Country X.

132. How many citizens of a certain state are eligible to vote?
1. All citizens over 18 years of age are eligible to vote.
2. Those under 18 years of age make up 30 percent of the population of the state.

133. What is the property tax on a piece of land worth $40,000?
1. The land is assessed at 60 percent of its value.
2. The tax rate is $2.10 per $1.000 of assessed value.

134. If \( r \) and \( s \) are integers, is \( r \) greater than \( s \)?
1. \( r^2 > s^2 \)
2. \( r^2 > s^3 \)

135. By what amount are both the length and width of a rectangle increased?
1. The rectangle was originally 60 feet long and 50 feet wide.
2. If both the length and width are increased by the same amount, the area is increased by 1,200 square feet.

136. If \( n \) is a positive integer, is \( \left( \frac{1}{10} \right)^n < 0.01 \)?
1. \( n > 2 \)
2. \( \left( \frac{1}{10} \right)^{n-1} < 0.1 \)

137. If \( x < 0 \), is \( y > 0 \)?
1. \( \frac{x}{y} < 0 \)
2. \( y - x > 0 \)

138. If \( x \), \( y \), and \( z \) are positive integers, is \( x - y \) odd?
1. \( x = 2 \)
2. \( y = (z - 1)^2 \)

139. What is the tens digit of positive integer \( x \)?
1. \( x \) divided by 100 has a remainder of 30.
2. \( x \) divided by 110 has a remainder of 30.

140. If \( x \) and \( y \) are positive, is the ratio of \( x \) to \( y \) greater than 3?
1. \( x \) is 2 more than 3 times \( y \).
2. The ratio of \( 2x \) to \( 3y \) is greater than \( z \).

141. There are 150 people in a town who attend \( P \) or meeting \( Q \) or both. How many attend each meeting?
1. 60 people attend meeting \( P \) only.
2. 90 people attend meeting \( Q \).

142. Is \( y \) less than \( x \)?
1. \( 9x = 5t \), \( 6y = 4t \), \( t > 0 \)
2. \( x + y = 7 \)

143. In the figure above, rectangle \( PQRS \) has its diagonal \( QS \) along the x-axis, point \( Q \) has coordinates (6,0), and point \( S \) has coordinates (-6,0). What are the coordinates of point \( P \)?
1. Diagonal \( PR \) passes through the origin.
2. The measure of \( \angle PQS \) is 30°.

144. The measure of \( \angle PQS \) is 30°.
144. In circle O above, line BD bisects \( \triangle ABC \). If \( CD \) has length 7, then the circumference of the circle is

A) 14
B) 18
C) 21
D) 28
E) 35

145. If \((a+b)^2\) is odd and \(b^2\) is even, then which of the following expression must be odd?

I. \(a\)
II. \(a^2\)
III. \(ab\)

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

146. A skirt is put on sale on Monday. On Tuesday, the price of the skirt is reduced by 10 percent. On Wednesday, the second price is reduced by \(\frac{1}{3}\). On Thursday the third price is reduced by 25 percent. The skirt is then sold for \$18. What was the price of the skirt on Monday?

A) \$26
B) \$30
C) \$33
D) \$37
E) \$40

147. If \(x-y = \frac{x+y}{x-y}\), then 10 - (6 - 4) =

A) 0
B) 19
C) 12
D) \(5\)
E) 3

148. If the shaded region of the rectangle above has an area of \(5x^2\). Which of the following could be the length \(x\) of the sides of the rectangle in terms of \(x^2\)?

A) \(2x, 3x\)

149. Laura can paint a certain room in 6 hours. Working together, Laura and Karen can paint the room in 3 hours and 20 minutes. How long would it take Karen to paint the room alone?

A) 6 hours 10 minutes
B) 6 hours 30 minutes
C) 6 hours 40 minutes
D) 7 hours
E) 7 hours 30 minutes

150. The rectangular solid above has a length of 9, a width of 4, and a height of 3, as shown. If a cylindrical section with a radius of 1 is removed from the solid, what is the total remaining volume of the solid?

A) \(36 - 4\pi\)
B) \(108 - 4\pi\)
C) \(108 - 3\pi\)
D) \(54 + 16\pi\)
E) \(108 - \pi\)

151. Twelve persons gather in a room for a meeting. Before the meeting begins each person shakes hands with every other person in the room exactly once. How many handshakes are there altogether before the meeting begins?

A) 24
B) 66
C) 121
D) 132
E) 144

152. A restaurant buys fruit in cans containing \(3\frac{1}{2}\) cups of fruit each. If the restaurant uses \(\frac{1}{2}\) cup
153. If \( x > 3,000 \), then the value of \( \frac{x}{2x + 1} \) is closest to

(A) \( \frac{1}{6} \)
(B) \( \frac{1}{3} \)
(C) \( \frac{10}{21} \)
(D) \( \frac{1}{2} \)
(E) \( \frac{3}{2} \)

154. Machine A produces 100 parts twice as fast as machine B does. Machine B produces 100 parts in 40 minutes. If each machine produces parts at a constant rate, how many parts does machine A produce in 6 minutes?

(A) 30
(B) 25
(C) 20
(D) 15
(E) 7.5

155. If 18 is 15 percent of 30 percent of a certain number, what is the number?

(A) 9
(B) 36
(C) 40
(D) 81
(E) 400

156. A necklace is made by stringing \( N \) individual beads together in the repeating pattern red bead, green bead, white bead, blue bead, and yellow bead. If the necklace design begins with a red bead and ends with a white bead, then \( N \) could equal

(A) 16
(B) 32
(C) 41
(D) 54
(E) 68

157. If \( x = (0.08)^2 \), \( y = \frac{1}{(0.08)^2} \), and \( z = (1 - 0.08)^2 - 1 \), which of the following is true?

(A) \( x = y = z \)
(B) \( y < z < x \)
(C) \( z < x < y \)
(D) \( y < z \) and \( x = z \).
(E) \( x < y \) and \( x = z \).

158. In \( \triangle ABC \) above, what is \( x \) in terms of \( z \)?

(A) \( z + 73 \)
(B) \( z - 73 \)
(C) \( 70 - z \)
(D) \( z - 70 \)
(E) \( 73 - z \)

159. In 1990 a total of \( x \) earthquakes occurred worldwide, some but not all of which occurred in Asia. If \( m \) of these earthquakes occurred in Asia, which of the following represents the ratio of the number of earthquakes that occurred in Asia to the number that did not occur in Asia?

(A) \( \frac{x}{m} \)
(B) \( \frac{m}{x} \)
(C) \( \frac{m}{x - m} \)
(D) \( \frac{x}{x - m} \)
(E) \( \frac{m}{x} \)

160. If \( \frac{x + y}{xy} = 1 \), then \( y = \)

(A) \( \frac{x}{x - 1} \)
(B) \( \frac{x}{x + 1} \)
(C) \( \frac{x - 1}{x} \)
(D) \( \frac{x + 1}{x} \)
(E) \( x \)
161. If \( \frac{1}{2} \) of the air in a tank is removed with each stroke of a vacuum pump, what fraction of the original amount of air has been removed after 4 strokes?

(A) \( \frac{15}{16} \)

(B) \( \frac{7}{8} \)

(C) \( \frac{1}{4} \)

(D) \( \frac{1}{8} \)

(E) \( \frac{1}{16} \)

162. Last year Department Store X had a sales total for December that was 4 times the average (arithmetic mean) of the monthly sales totals for January through November. The sales total for December was what fraction of the sales total for the year?

(A) \( \frac{1}{4} \)

(B) \( \frac{4}{15} \)

(C) \( \frac{1}{3} \)

(D) \( \frac{4}{11} \)

(E) \( \frac{4}{5} \)

163. How many integers \( n \) are there such that \( 1 < 5n + 5 < 25 \)?

(A) Five

(B) Four

(C) Three

(D) Two

(E) One

164. If the two-digit integers \( M \) and \( N \) are positive and have the same digits, but in reverse order, which of the following CANNOT be the sum of \( M \) and \( N \)?

(A) 181

(B) 165

(C) 121

(D) 99

(E) 44

165. Working alone, printers X, Y, and Z can do a certain printing job, consisting of a large number of pages, in 12, 15, and 18 hours, respectively. What is the ratio of the time it takes printer X to do the job, working alone at its rate, to the time it takes printers Y and Z to do the job, working together at their individual rates?

(A) \( \frac{4}{11} \)

(B) \( \frac{1}{2} \)

(C) \( \frac{15}{22} \)

(D) \( \frac{22}{15} \)

(E) \( \frac{11}{4} \)

166. In 1985 a company sold a brand of shoes to retailers for a fixed price per pair. In 1986 the number of pairs of the shoes that the company sold to retailers decreased by 20 percent, while the price per pair increased by 20 percent. If the company's revenue from the sale of the shoes in 1986 was $3.0 million, what was the approximate revenue from the sale of the shoes in 1985?

(A) $2.4 million

(B) $2.9 million

(C) $3.0 million

(D) $3.1 million

(E) $3.6 million

167. After successive discounts of 15 percent and 10 percent have been allowed on the marked price of a certain article, the net price is $306. What is the marked price?

(A) $234.09

(B) $382.50

(C) $387.09

(D) $400.00

(E) $2,040.00

168. The area \( K \) of a triangle is given by the formula \( K = \frac{1}{2}bh \). If \( b \) is increased by 10 percent and \( h \) is decreased by 10 percent then \( K \) is

(A) diminished by 1 percent

(B) increased by 1 percent

(C) decreased by about 5 percent

(D) increased by about 5 percent

(E) remains unchanged
GMAT

PROBLEM SOLVING

169. If Mario was 32 years old 8 years ago, how old was he x years ago?

(A) x - 40  
(B) x + 24  
(C) 40 - x  
(D) 24 - x  
(E) 24 + x

170. Running at the same constant rate, 6 identical machines can produce a total of 270 bottles per minute. At this rate, how many bottles could 10 such machines produce in 4 minutes?

(A) 648  
(B) 1,800  
(C) 2,700  
(D) 10,800  
(E) 64,800

171. Three business partners, Q, R, and S, agree to divide their total profit for a certain year in the ratios 2 : 5 : 8, respectively. If Q's share was $4,000, what was the total profit of the business partners for the year?

(A) $25,000  
(B) $30,000  
(C) $52,000  
(D) $60,000  
(E) $300,000

172. Of the five coordinates associated with points A, B, C, D, and E on the number line above, which has the greatest absolute value?

(A) A  
(B) B  
(C) C  
(D) D  
(E) E

173. A restaurant meal cost $35.50 and there was no tax. If the tip was more than 10 percent but less than 15 percent of the cost of the meal, then the total amount paid must have been between

(A) $40 and $42  
(B) $39 and $41  
(C) $38 and $40  
(D) $37 and $39  
(E) $36 and $37

174. Harriet wants to put up fencing around three sides of her rectangular yard and leave a side of 20 feet unfenced. If the yard has an area of 680 square feet, how many feet of fencing does she need?

(A) 34  
(B) 40  
(C) 68  
(D) 88  
(E) 102

175. If \( u > t, r > q, s > t, \) and \( t > r, \) which of the following must be true?

I. \( u > s \)  
II. \( s > q \)  
III. \( u > r \)

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

176. Increasing the original price of an article by 15 percent and then increasing the new price by 15 percent is equivalent to increasing the original price by

(A) 32.25%  
(B) 31.00%  
(C) 30.25%  
(D) 30.00%  
(E) 22.50%

177. If \( k \) is an integer and \( 0.0010101 \times 10^k \) is greater than 1,000, what is the least possible value of \( k \)?

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

178. If \((b-3)(4+2/b) = 0\) and \(b \neq 3\), then \(b = \)

(A) -8  
(B) -2  
(C) -1/2  
(D) 1/2  
(E) 2

179. In a weight-lifting competition, the total weight of Joe's two lifts was 750 pounds. If twice the weight of his first lift was 300 pounds more than the weight of his second lift, what was the weight, in pounds, of his first lift?

(A) 225  
(B) 275  
(C) 325  
(D) 350  
(E) 400

180. One hour after Yolanda started walking from X to Y, a distance of 45 miles, Bob started walking along the same road from Y to X. If Yolanda's walking rate was 3 miles per
hour and Bob's was 4 miles per hour, how many miles had Bob walked when they met?

(A) 24  (B) 23  
(C) 22  (D) 21  
(E) 19.5

181. The average (arithmetic mean) of 6 numbers is 8.5. When one number is discarded, the average of the remaining numbers becomes 7.2. What is the discarded number?

(A) 7.8  (B) 9.8  
(C) 10.0  (D) 124  
(E) 15.0

182. In the rectangular coordinate system above, the area of \( \triangle RST \) is

(A) \( \frac{bc}{2} \)  
(B) \( \frac{b(c-1)}{2} \)  
(C) \( \frac{a(b-1)}{2} \)  
(D) \( \frac{a(c-1)}{2} \)  
(E) \( \frac{a(c-1)}{2} \)

183. Which of the following equations has a root in common with \( x^2 - 6x + 5 = 0 \)?

(A) \( x^2 + 1 = 0 \)  
(B) \( x^2 - x - 2 = 0 \)  
(C) \( x^2 - 10x - 5 = 0 \)  
(D) \( 2x^2 - 2 = 0 \)  
(E) \( x^2 - 2x - 3 = 0 \)

4. One inlet pipe fills an empty tank in 5 hours. A second inlet pipe fills the same tank in 3 hours. If both pipes are used together, how long will it take to fill 2/3 of the tank?

(A) 8/15 hr  
(B) 3/4 hr  
(C) 5/4 hr  
(D) 15/8 hr  
(E) 8/3 hr

5. Two oil cans, X and Y, are right circular cylinders, and the height and the radius of Y are each twice those of X. If the

oil in can X, which is filled to capacity, sells for $2, then at the same rate, how much does the oil in can Y sell for if Y is filled to only half its capacity?

(A) $1  
(B) $2  
(C) $3  
(D) $4  
(E) $8

186. If \( x, y, \) and \( z \) are positive integers such that \( x \) is a factor of \( y \), and \( x \) is a multiple of \( z \), which of the following is NOT necessarily an integer?

(A) \( \frac{x+y}{z} \)  
(B) \( \frac{y+z}{x} \)  
(C) \( \frac{x+y}{z} \)  
(D) \( \frac{xy}{z} \)  
(E) \( \frac{yz}{x} \)

187. If \( x + y = 8z \), then which of the following represents the average (arithmetic mean) of \( x, y, \) and \( z \), in terms of \( z \)?

(A) \( 2x + 1 \)  
(B) \( 3z \)  
(C) \( 5z \)  
(D) \( 2z/3 \)  
(E) \( 3z/2 \)

188. If the product of the integers \( w, x, y, \) and \( z \) is 770, and if \( 1 < w < x < y < z \), what is the value of \( w + z \)?

(A) 10  
(B) 13  
(C) 16  
(D) 18  
(E) 21
PROBLEM SOLVING

189. During the first week of September, a shoe retailer sold 10 pairs of a certain style of oxfords at $35.00 a pair. If, during the second week of September, 15 pairs were sold at the sale price of $27.50 a pair, by what amount did the revenue from weekly sales of these oxfords increase during the second week?

(A) $62.50  (B) $75.00
(C) $112.50  (D) $137.50
(E) $175.00

190. The number 2 - 0.5 is how many times the number 1 - 0.5?

(A) 2  (B) 2.5
(C) 3  (D) 3.5
(E) 4

191. If x = -1, then -(x^4 + x^3 + x^2 + x) =

(A) -10  (B) -4
(C) 0  (D) 4
(E) 10

192. Coins are dropped into a toll box so that the box is being filled at the rate of approximately 2 cubic feet per hour. If the empty rectangular box is 4 feet long, 4 feet wide, and 3 feet deep, approximately how many hours does it take to fill the box?

(A) 4  (B) 8
(C) 16  (D) 24
(E) 48

193. \((1/5)^2 - (1/5)(1/4) =

(A) -1/20  (B) -1/100
(C) 1/100  (D) 1/20
(E) 1/5

194. A club collected exactly $599 from its members. If each member contributed at least $12, what is the greatest number of members the club could have?

(A) 43  (B) 44
(C) 49  (D) 50
(E) 51

195. A union contract specifies a 6 percent salary increase plus a $450 bonus for each employee. For a certain employee, this is equivalent to an 8 percent salary increase. What was this employee's salary before the new contract?

(A) $21,500  (B) $22,500
(C) $23,500  (D) $24,300
(E) $25,000

196. If \(n\) is a positive integer and \(n + 2 = 3^n\), which of the following could NOT be a value of \(n\)?

(A) 1  (B) 4
(C) 7  (D) 25
(E) 79

197. Elena purchased brand X pens for $4.00 a piece and brand Y pens for $2.80 a piece. If Elena purchased a total of 12 of these pens for $42.00, how many brand X pens did she purchase?

(A) 4  (B) 5
(C) 6  (D) 7
(E) 8

198. If the length and width of a rectangular garden plot were each increased by 20 percent, what would be the percent increase in the area of the plot?

(A) 20%  (B) 24%
(C) 36%  (D) 40%
(E) 44%

199. The population of a bacteria culture doubles every 2 minutes. Approximately how many minutes will it take for the population to grow from 1,000 to 500,000 bacteria?

(A) 10  (B) 12
(C) 14  (D) 16
(E) 18

200. When 10 is divided by the positive integer \(n\), the remainder is \(n - 4\). Which of the following could be the value of \(n\)?

(A) 3  (B) 4
(C) 7  (D) 8
(E) 12

201. For a light that has an intensity of 60 candles at its source, the intensity in candles, \(S\), of the light at a point \(d\) feet from the source is given by the formula \(S = 60/kd\), where \(k\) is a constant. If the intensity of the light is 30 candles at a distance of 2 feet from the source, what is the intensity of the light at a distance of 20 feet from the source?

(A) 3/10 candle  (B) 1/2 candle
202. If \( x \) and \( y \) are prime numbers, which of the following CANNOT be the sum of \( x \) and \( y \)?

(A) 5  
(B) 9  
(C) 13  
(D) 16  
(E) 23

203. Of the 3,600 employees of Company X, \( \frac{1}{3} \) are clerical. If the clerical staff were to be reduced by \( \frac{1}{3} \), what percent of the total number of the remaining employees would then be clerical?

(A) 25%  
(B) 22.2%  
(C) 20%  
(D) 12.5%  
(E) 11.1%

204. In which of the following pairs are the two numbers reciprocals of each other?

I. 3 and \( \frac{1}{3} \)  
II. \( \frac{1}{17} \) and \( -\frac{1}{17} \)  
III. \( \sqrt{3} \) and \( \sqrt{3}/3 \)

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

205. If \( X \) and \( Y \) are sets of integers, \( X \Delta Y \) denotes the set of integers that belong to set \( X \) or set \( Y \), but not both. If \( X \) consists of 10 integers, \( Y \) consists of 18 integers, and 6 of the integers are in both \( X \) and \( Y \), then \( X \Delta Y \) consists of how many integers?

(A) 6  
(B) 16  
(C) 22  
(D) 30  
(E) 174

206. During the four years that Mrs. Lopez owned her car, she found her total car expenses were \$18,000. Fuel and maintenance costs accounted for \( \frac{1}{3} \) of the total and depreciation accounted for \( \frac{3}{5} \) of the remainder. The cost of insurance was 3 times the cost of financing, and together these two costs accounted for \( \frac{1}{5} \) of the total. If the only other expenses were taxes and license fees, then the cost of financing was how much more or less than the cost of taxes and license fees?

(A) \$1,500 more  
(B) \$1,200 more  
(C) \$100 less

207. A car travels from Mayville to Rome at an average speed of 30 miles per hour and returns immediately along the same route at an average speed of 40 miles per hour. Of the following, which is closest to the average speed, in miles per hour, for the round-trip?

(A) 32.0  
(B) 33.0  
(C) 34.3  
(D) 35.5  
(E) 36.5

208. If \( 0.0015 \times 10^m = 5 \times 10^7 \), then \( m \cdot k = \)

(A) 9  
(B) 8  
(C) 7  
(D) 6  
(E) 5

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209. What is 45 percent of 7/12 of 240?

(A) 63  (B) 90  (C) 108  (D) 140  (E) 311

210. If x books cost $5 each and y books cost $8 each, then the average (arithmetic mean) cost, in dollars per book, is equal to

(A) \( \frac{5x + 8y}{x + y} \)  (B) \( \frac{5x + 8y}{x + y} \)  (C) \( \frac{5x + 8y}{13} \)  (D) \( \frac{40xy}{xy} \)  (E) \( \frac{40xy}{13} \)

211. If 1/2 of the money in a certain trust fund was invested in stocks, 1/4 in bonds, 1/5 in a mutual fund, and the remaining $10,000 in a government certificate, what was the total amount of the trust fund?

(A) $100,000  (B) $150,000  (C) $200,000  (D) $500,000  (E) $2,000,000

212. Marion rented a car for $18.00 plus $0.10 per mile driven. Craig rented a car for $25.00 plus $0.05 per mile driven. If each drove d miles and each was charged exactly the same amount for the rental, then d equals

(A) 100  (B) 120  (C) 135  (D) 140  (E) 150

213. Machine A produces bolts at a uniform rate of 120 every 40 seconds, and machine B produces bolts at a uniform rate of 100 every 20 seconds. If the two machines run simultaneously, how many seconds will it take for them to produce a total of 200 bolts?

(A) 22  (B) 25  (C) 28  (D) 32  (E) 56

214. \[3.003 - 2.002\]

(A) 1.05  (B) 1.0015  (C) 1.501  (D) 1.5015

215. In 1982 the approximate average cost of operating a subcompact car for 10,000 miles was

(A) $360  (B) $3,400  (C) $4,100  (D) $4,500  (E) $4,900

216. In 1984 the average cost of operating a subcompact car was approximately what percent less than the average cost of operating a midsize car?

(A) 12%  (B) 17%  (C) 25%  (D) 33%  (E) 48%

217. For each of the years shown, the average cost per mile of operating a compact car minus the average cost per mile of operating a subcompact car was between

(A) $0.12 and $0.18  (B) $0.10 and $0.15  (C) $0.09 and $0.13  (D) $0.06 and $0.12  (E) $0.05 and $0.08

218. What is the decimal equivalent of \(\frac{1}{5^5}\)?

(A) 0.00032  (B) 0.0016  (C) 0.00625  (D) 0.008  (E) 0.03125
219. Two hundred gallons of fuel oil are purchased at $0.91 per gallon and are consumed at a rate of $0.70 worth of fuel per hour. At this rate, how many hours are required to consume the 200 gallons of fuel oil?

(A) 140  (B) 220  
(C) 260  (D) 322  
(E) 330

220. If \(4 - \frac{x}{x^2 + 3x - 4}\), what is the value of \(x^2 + 3x - 4\)?

\[
2 + x
\]

(A) -4  (B) -1  
(C) 0  (D) 1  
(E) 2

221. If \(b < 2\) and \(2x - 3b = 0\), which of the following must be true?

(A) \(x > -3\)  (B) \(x < 2\)  
(C) \(x = 3\)  (D) \(x < 3\)  
(E) \(x > 3\)

222. The trapezoid shown in the figure above represents a cross section of the rudder of a ship. If the distance from \(A\) to \(B\) is 13 feet, what is the area of the cross section of the rudder in square feet?

(A) 39  (B) 40  
(C) 42  (D) 45  
(E) 46.5

223. \((-1.5)(1.2) - (4.5)(0.4) = \)

\[
\frac{-30}{30}
\]

(A) -1.2  (B) -0.12  
(C) 0  (D) 0.12  
(E) 1.2

224. If \(n\) is a positive integer, then \(n(n + 1)(n + 2)\) is

(A) even only when \(n\) is even  
(B) even only when \(n\) is odd  
(C) odd whenever \(n\) is odd

225. If a square region has area \(x\), what is the length of its diagonal in terms of \(x\)?

(A) \(\sqrt{x}\)  (B) \(\sqrt{2x}\)  
(C) \(2\sqrt{x}\)  (D) \(x\sqrt{2}\)  
(E) 2\(x\)

226. In a certain class consisting of 36 students, some boys and some girls, exactly \(1/3\) of the boys and exactly \(1/4\) of the girls walk to school. What is the greatest possible number of students in this class who walk to school?

(A) 9  (B) 10  
(C) 11  (D) 12  
(E) 13

227. The sum of the ages of Doris and Fred is \(y\) years. If Doris is 12 years older than Fred, how many years old will Fred be \(y\) years from now, in terms of \(y\)?

\[
\begin{align*}
(A) & \quad y - 6 \\
(B) & \quad 2y - 6 \\
(C) & \quad \frac{y - 6}{2} \\
(D) & \quad \frac{3y - 6}{2} \\
(E) & \quad \frac{5y - 6}{2} \\
\end{align*}
\]

\[
\begin{align*}
1,234 & \\
1,243 & \\
1,324 & \\
\cdots & \\
\cdots & \\
\cdots & \\
+ 4,321 & \\
\end{align*}
\]

228. The addition problem above shows four of the 24 different integers that can be formed by using each of the digits 1, 2, 3, and 4 exactly once in each integer. What is the sum of these 24 integers?

(A) 24,000  (B) 26,664  
(C) 40,440  (D) 60,000  
(E) 66,660
229. If \( q = 0 \), \( 3p = 4q \), and \( 2r = 5p \) what is the ratio of \( r \) to \( q \)?

A) 3:10
B) 2:5
C) 4:3
D) 10:3
E) 20:3

230. A man can type a report in 20 minutes. At this rate, what part of the report can he type in \( k \) minutes?

A) \( \frac{k}{20} \)
B) \( \frac{20}{k} \)
C) \( \frac{1}{20k} \)
D) \( \frac{2}{20 - k} \)
E) \( \frac{20 - k}{k} \)

231. Which of the following integers can NOT be written as the sum of two prime numbers?

A) 16
B) 23
C) 24
D) 28
E) 30

232. Veronica started walking at 3 miles per hour. Rita started from the same point 2 \( \frac{1}{2} \) hours later and traveled the same route by bicycle at a rate of 8 miles per hour. In how many hours did Rita overtake Veronica?

A) 4
B) \( 3 \frac{1}{2} \)
C) 3
D) \( 2 \frac{1}{4} \)
E) \( 1 \frac{1}{2} \)

233. A gift worth \( x \) dollars is being bought by \( n \) students. If 6 of the purchasers drop out and some remain, how many more dollars will each of the remaining contributors have to pay?

A) \( \frac{x}{6} \)
B) \( \frac{x}{n - 6} \)

234. If a bicycle wheel has a radius of 14 inches, how many revolutions will the wheel make in a mile? (1 mile = 5.280 feet)

A) 5.280
B) 63.360
C) 5.280
D) 15.840
E) 63.360

235. With a new machine, a factory was able to increase its production of batteries by 30 percent, thus making 60 more batteries per hour. With this new machine, how many batteries were produced in an 8 hour day?

A) 1.450
B) 1.620
C) 1.840
D) 2.080
E) 2.400

236. If \( p = \frac{1}{2} \) \( q = \frac{2}{3} \) \( r \), then in terms of \( p \), \( q - r = \)

A) \( \frac{5p}{2} \)
B) \( \frac{4p}{3} \)
C) \( \frac{3p}{2} \)
D) \( \frac{p}{2} \)
E) \( \frac{p}{3} \)

237. The sum of three consecutive even integers is always divisible by which of the following?

I. 2
II. 3
III. 4
IV. 6

A) I and II only
B) I and IV only
C) II and IV only
D) I, II and III only
E) I, II and IV only
Qts. 238-239 refer to the following table.

**U.S. Population, 1950-1975**  
(in millions)

<table>
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<tbody>
<tr>
<td>Population</td>
<td>152</td>
<td>166</td>
<td>181</td>
<td>196</td>
<td>205</td>
<td>213</td>
</tr>
</tbody>
</table>

238. During which 5-year period did the United States have the lowest percent increase in population?  
A) 1950-55  
B) 1955-60  
C) 1960-65  
D) 1965-70  
E) 1970-75

239. If the population had continued to grow uniformly at the same rate that it grew from 1970 to 1975, what would have been the population in millions in 1980?  
A) 215  
B) 218  
C) 221  
D) 224  
E) 227

240. If \( m \neq 0 \) and \( m - p = \frac{d}{m} \), what is the value of \( p \) in terms of \( m \)?  
A) \( \frac{m^2}{1-m} \)  
B) \( \frac{m^2}{1+m} \)  
C) \( \frac{1-m}{m^2} \)  
D) \( \frac{1-m}{m^2} \)  
E) \( \frac{(1-m)^2}{m} \)

244. In the figure above, two congruent squares are placed side by side to form a rectangle. What is the ratio of the length of the diagonal of the square to the length of the diagonal of the rectangle thus formed?  
A) \( \sqrt{2} : \sqrt{5} \)  
B) \( \sqrt{2} : \sqrt{3} \)  
C) 1 : 2  
D) 2 : 3  
E) \( \sqrt{3} : \sqrt{5} \)

245. A man earned $4,000 during his first half-year of work. At the end of that half-year and at the end of each half-year thereafter, he got a raise of $200 per half-year. How much did he earn during his entire fifth year of employment?  
A) $5,600  
B) $5,800  
C) $11,200  
D) $11,400  
E) $12,000

246. What is the volume of a cube with a surface area of \( 54t^2 \)?  
A) \( 9t^2 \)  
B) \( 27t^2 \)  
C) \( 9t^3 \)  
D) \( 27t^3 \)  
E) \( 54t^3 \)
247. If the distance covered by a moving object decreases by 20 percent and the rate increases by 20 percent then the time
A) remains the same
B) increases by 20 %
C) decreases by 20 %
D) increases by \(33 \frac{1}{3}\) %
E) decreases by \(33 \frac{1}{3}\) %

252. The vertex angle of an isosceles triangle has a measure of \(r^\circ\). How many degrees are there in the angle formed by the bisectors of the base angles of the triangle?
A) \(90 + \frac{r}{2}\)
B) \(90 - \frac{r}{2}\)
C) \(180 + \frac{r}{2}\)
D) \(180 - \frac{r}{2}\)
E) \(180 - r\)

253. If 80 cubic centimeters of a 5 percent solution of acid are added to 120 cubic centimeters of a 10 percent solution of the same acid, what is the concentration of acid in the resulting solution?
A) 6.5%
B) 7.0%
C) 7.5%
D) 8.0%
E) 8.5%

254. A car averages \(m\) miles on \(g\) gallons of gasoline. At the same rate, how many miles will the car travel on \(n\) gallons?
A) \(\frac{mn}{g}\)
B) \(\frac{ng}{mn}\)
C) \(\frac{mg}{n}\)
D) \(\frac{gn}{m}\)
E) \(\frac{mg}{n}\)

255. A circle of radius \(r\) has a circumference equal to \(C\). A square of side \(r\) has a perimeter equal to \(P\). Which one of the following inequalities correctly expresses the relationship between \(C\) and \(P\)?
A) \(0 < C > P\)
B) \(P < C < 2P\)
C) \(2P < C < 3P\)
D) \(2P < C < 3P\)
E) \(3P < 3C < 4P\)

256. A woman paid $1,650 a year in interest on a loan with an annual rate of 11 percent. How much more money could she have borrowed for the same amount of interest if she had been able to get a loan with an annual rate of 10 percent?
257. A consumer bought $3.80 worth of apples and oranges from a produce vendor. If the apples cost 20c each and the oranges cost 25c each, what is the minimum number of apples that the consumer purchased?
   A) 0  B) 2  C) 4  D) 12  E) 19

258. The cost of gold paint needed to cover a cube of edge 3 centimeters is $24. At the same cost per square centimeter, what is the cost of gold paint needed to cover the surface of a cube of edge 6 centimeters?
   A) $48  B) $72  C) $96  D) $192  E) $486

259. Which of the following is the area of a circle whose diameter is an integer?
   A) \(\frac{25\pi}{16}\)  B) \(\frac{8\pi}{4}\)  C) \(3\pi\)  D) \(\frac{36\pi}{9}\)  E) \(\frac{64\pi}{2}\)

260. An item costing C dollars is sold for a gain of r percent on the cost. What is the selling price of the article in dollars?
   A) C\left(1+\frac{r}{100}\right)\)  B) C(1 + r)  C) \(\frac{C}{100}\)  D) \(\frac{C(1+r)}{100}\)  E) C + \(\frac{r}{100}\)

261. Which of the following is the best approximation of \(\sqrt{2.697} - 9.03\) ?
   (A) 11  (B) 9  (C) 7  (D) 5  (E) 3

262. An appliance store buys refrigerators at a cost of $5000 each. Marks a price on them and then sells them at a discount of 25 percent off that price. What is the marked price if the discounted price is 20 percent greater than the cost of each refrigerator?
   (A) $525  (B) $600  (C) $725  (D) $750  (E) $800

263. If \(x\) exceeds \(y\) by \(\frac{2}{3}\), then \(y\) is what fraction of \(x\)?
   A) \(\frac{1}{3}\)  B) \(\frac{2}{5}\)  C) \(\frac{3}{5}\)  D) \(\frac{2}{3}\)  E) \(\frac{3}{2}\)

264. How many different committees each composed of 2 Republicans and 3 Democrats can be formed from a group of 4 Republicans and 5 Democrats?
   A) 12  B) 24  C) 60  D) 72  E) 120

265. On a bill for $5,000, what is the difference between a single discount of 40 percent and two successive discounts of 36 percent and 4 percent?
   A) $208  B) $200  C) $128  D) $72  E) $0

266. The equation \(y = \frac{5}{y^3} = 3 \cdot \frac{5}{y^3}\) has
   A) an infinite number of roots, all of them real
   B) exactly two roots, both nonintegral
   C) exactly two roots, both integral
   D) exactly one root, which is integral
   E) no roots

267. If \(w\) women can do a job in \(d\) days, then how many days will it take \((w + n)\) women to do the job if all the women work at the same rate?
   A) \(\frac{dw}{n+w}\)  B) \(\frac{n+w}{d}\)  C) \(\frac{n+w}{dw}\)  D) \(\frac{d}{n+w}\)  E) \(\frac{dn+w}{w}\)

268. A bus traveled 240 miles from \(p\) to \(q\) at 40 miles per hour and returned the same distance at 60 miles per hour. What was its average speed for the round trip in miles per hour?
   A) 45  B) 48  C) 50  D) 55  E) 58

269. A window washer places a 25-foot ladder against the side of a building that is perpendicular to level ground. Initially, the bottom of the ladder is 7 feet from the base of the building. If the window washer wants the top of the ladder to be 4 feet lower, how many feet farther from the base of the building must he move the bottom of the ladder?
   A) 3  B) 4  C) 7  D) 8  E) 15

270. The top, front, and side areas of a rectangular box are known. The product of these areas is equal to
   A) the volume of the box
271. A rectangular field is twice as long as it is wide, and it is completely enclosed by meters of fencing. The area in terms of m is

- A) \( \frac{m^2}{2} \)
- B) \( \frac{m^2}{3} \)
- C) \( \frac{2m^2}{9} \)
- D) \( \frac{m^2}{9} \)
- E) \( \frac{m^2}{18} \)

272. If \( n \) is a positive integer, by which of the following numbers is \( n^3 - n \) always divisible?

I. 2
II. 3
III. 4
IV. 6

- A) I only
- B) II only
- C) I and II only
- D) I, II, and IV only
- E) I, II, III, and IV

273. Two classes took the same test. One class of 20 students made an average grade of 70 percent; the other class of 30 students made an average grade of 80 percent. What was the average grade made by all the students in both classes?

- A) \( \frac{76}{3} \)%
- B) 76%
- C) 75%
- D) 74%
- E) It cannot be determined from the information given.

274. Is \( p \) an odd integer?

1) \( p^2 \) is an odd integer.
2) \( 2p \) is an even integer.

275. What is the value of \( r^2 + s^2 \)?

1) \( r - s = 12 \)
2) \( r + s = 15 \)

276. What single discount, in percent, is equivalent to two successive discounts?

1) The first discount is a 20 percent reduction of the listed price.
2) The second discount is a 10 percent discount for immediate payment.

277. How many players tried out for the football team at Blarney College?

1) Twelve were seniors.
2) Eighteen, or 60 percent, of those who tried out were juniors.

278. Is \( n \) a negative number?

1) \( n^2 \) is a positive number.
2) \( n^3 \) is a negative number

279. Is quadrilateral PQRS a rectangle?

1) Diagonals PR and QS bisect each other.
2) \( \angle P \) and \( \angle Q \) have the same measure

280. Is \( t \) a positive integer?

1) \( \frac{t}{7} \) is a positive integer.
2) \( \frac{7}{t} \) is a positive integer.

281. Jerry has $1.60 in coins. All in nickels and dimes. How many dimes does he have?

1) He has 4 more dimes than nickels.
2) He has 20 coins altogether.

282. A rectangle and a square are equal in area. What is the length of the side of the square?

1) The length of the rectangle is 3 inches more than a side of the square.
2) The width of the rectangle is 2 inches less than a side of the square.

283. In the figure above, is the length of arc PSR greater than the sum of the lengths of arc PMQ and arc QNR?

1) Arc PSR is a semicircle.
2) Arcs PMQ and QNR are semicircles

284. A silver bar in the shape of a rectangular solid is 5 feet long, 4 feet wide, and 3 feet high. It is melted down and cast into two cubes. What are the lengths of the edges of the two cubes?

1) The two cubes have equal volumes.
2) The length of the diagonal of the original rectangular silver bar is \( 5\sqrt{2} \).

285. Is \( \triangle RST \) a right triangle?

1) \( \angle R \) and \( \angle T \) are complementary.
2) \( (RS)^2 + (ST)^2 = (RT)^2 \)
285. At a certain picnic, each of the guests was served either a single scoop or a double scoop of ice cream. How many of the guests were served a double scoop of ice cream?

1. At the picnic, 60 percent of the guests were served a double scoop of ice cream.
2. A total of 120 scoops of ice cream were served to all the guests at the picnic.

287. By what percent was the price of a certain candy bar increased?

1. The price of the candy bar was increased by 5 cents.
2. The price of the candy bar after the increase was 45 cents.

288. A circular tub has a band painted around its circumference, as shown above. What is the surface area of this painted band?

1. \( x = 0.5 \)
2. The height of the tub is 1 meter.

289. Is it true that \( a > b \)?

1. \( 2a > 2b \)
2. \( a + c > b + c \)

290. A thoroughly blended biscuit mix includes only flour and baking powder. What is the ratio of the number of grams of baking powder to the number of grams of flour in the mix?

1. Exactly 9.9 grams of flour is contained in 10 grams of the mix.
2. Exactly 0.3 gram of baking powder is contained in 30 grams of the mix.

291. If a real estate agent received a commission of 5 percent of the selling price of a certain house, what was the selling price of the house?

1. The selling price minus the real estate agent's commission was \( \$84,600 \).
2. The selling price was 250 percent of the original purchase price of \( \$36,000 \).

292. What is the value of \( |x| \)?

1. \( x = -\sqrt{4} \)
2. \( x^2 = 4 \)

293. What is the value of \( z \) in the triangle above?

1. \( x + y = 139 \)
2. \( y + z = 108 \)

294. A certain bakery sells rye bread in 16-ounce loaves and 24-ounce loaves, and all loaves of the same size sell for the same price per loaf regardless of the number of loaves purchased. What is the price of a 24-ounce loaf of rye bread in this bakery?

1. The total price of a 16-ounce loaf and a 24-ounce loaf of this bread is \( \$2.40 \).
2. The total price of two 16-ounce loaves and one 24-ounce loaf of this bread is \( \$3.40 \).

295. If \( \sqrt[3]{x/y} = n \), what is the value of \( x \)?

1. \( yn = 10 \)
2. \( y = 40 \) and \( n = 1/4 \)

296. If \( m \) and \( n \) are consecutive positive integers, is \( m \) greater than \( n \)?

1. \( m - 1 \) and \( n + 1 \) are consecutive positive integers.
297. Paula and Sandy were among those people who sold raffle tickets to raise money for Club X. If Paula and Sandy sold a total of 100 of the tickets, how many of the tickets did Paula sell?

1. Sandy sold \( \frac{2}{3} \) as many of the raffle tickets as Paula did.
2. Sandy sold 8 percent of all the raffle tickets sold for Club X.

298. Is the integer \( n \) odd?

1. \( n \) is divisible by 3.
2. \( n \) is divisible by 5.

301. If \( x \) is equal to one of the numbers \( \frac{1}{4}, \frac{3}{8}, \text{ or } \frac{2}{5} \), what is the value of \( x \)?

1. \( \frac{1}{4} < x < \frac{1}{2} \)
2. \( \frac{1}{3} < x < \frac{3}{5} \)

302. If \( a, b, \text{ and } c \) are integers, is \( a - b + c \) greater than \( a + b - c \)?

1. \( b \) is negative.
2. \( c \) is positive.

303. If \( x + 2y + 1 = y - x \), what is the value of \( x \)?

1. \( y^2 = 9 \)
2. \( y = 3 \)

304. If \( n \) is an integer, then \( n \) is divisible by how many positive integers?

1. \( n \) is the product of two different prime numbers.
2. \( n \) and \( 2^3 \) are each divisible by the same number of positive integers.

305. How many miles long is the route from Houghton to Callahan?

1. It will take 1 hour less time to travel the entire route at an average rate of 55 miles per hour than at an average rate of 50 miles per hour.
2. It will take 11 hours to travel the first half the route at an average rate of 25 miles per hour.
306. If x and y are positive, what is the value of x?

(1) x = 3.927y  
(2) y = 2.279

307. John and David each received a salary increase. Which one received the greater dollar increase?

(1) John’s salary increased 8 percent.
(2) David’s salary increased 5 percent.

308. Carlotta can drive from her home to her office by one of two possible routes. If she must also return by one of these routes, what is the distance of the shorter route?

(1) When she drives from her home to her office by the shorter route and returns by the longer route, she drives a total of 42 kilometers.
(2) When she drives both ways, from her home to her office and back, by the longer route, she drives a total of 46 kilometers.

309. If r and s are positive integers, r is what percent of s?

(1) r = 3/4s  
(2) r/s = 0.75

310. A shirt and a pair of gloves cost a total of $41.70. How much does the pair of gloves cost?

(1) The shirt costs twice as much as the gloves.
(2) The shirt costs $27.80.

11. What is the number of 360-degree rotations that a bicycle wheel made while rolling 100 meters in a straight line without slipping?

(1) The diameter of the bicycle wheel, including the tire, was 0.5 meter.
(2) The wheel made twenty 360-degree rotations per minute.

2. What is the value of the sum of a list of n odd integers?

(1) n = 8  
(2) The square of the number of integers on the list is 64.

If a certain animated cartoon consists of a total of 17,280 frames on film, how many minutes will it take to run the cartoon?

(1) The cartoon runs without interruption at the rate of 24 frames per second.
(2) It takes 6 times as long to run the cartoon as it takes to rewind the film, and it takes a total of 14 minutes to do both.

314. What was the average number of miles per gallon of gasoline for a car during a certain trip?

(1) The total cost of the gasoline used by the car for the 180-mile trip was $12.00.
(2) The cost of the gasoline used by the car for the trip was $1.20 per gallon.

315. If x and y are positive, is x/y greater than 1?

(1) xy > 1  
(2) x - y > 0

316. In \( \triangle PQR \), if \( PQ = x \), \( QR = x + 2 \), and \( PR = y \), which of the three angles of \( \triangle PQR \) has the greatest degree measure?

(1) \( y = x + 3 \)  
(2) \( x = 2 \)

317. Is the prime number p equal to 37?

(1) \( p = n^2 + 1 \), where \( n \) is an integer.
(2) \( p^2 \) is greater than 200.

318. The only contents of a parcel are 25 photographs and 30 negatives. What is the total weight, in ounces, of the parcel’s contents?

(1) The weight of each photograph is 3 times the weight of each negative.
(2) The total weight of 1 of the photographs and 2 of the negatives is 1/3 ounce.

319. If l and w represent the length and width, respectively, of the rectangle above, what is the perimeter?

(1) \( 2l + w = 40 \)  
(2) \( l + w = 25 \)

320. What is the ratio of x to y?

(1) x is 4 more than twice y.
(2) The ratio of 0.5x to 2y is 3 to 5.
321. If $x$, $y$, and $z$ are three integers, are they consecutive integers?

(1) $z - x = 2$  
(2) $x < y < z$

322. What is the value of $x$?

(1) $-(x + y) = x - y$  
(2) $x + y = 2$

323. A sum of $200,000 from a certain estate was divided among a spouse and three children. How much of the estate did the youngest child receive?

(1) The spouse received $\frac{1}{2}$ of the sum from the estate, and the oldest child received $\frac{1}{4}$ of the remainder.
(2) Each of the two younger children received $12,500 more than the oldest child and $62,500 less than the spouse.

324. If the Lincoln Library's total expenditure for books, periodicals, and newspapers last year was $35,000, how much of the expenditure was for books?

(1) The expenditure for newspapers was 40 percent greater than the expenditure for periodicals
(2) The total of the expenditure for periodicals and newspapers was 25 percent less than the expenditure for books.

325. The symbol $\nabla$ represents one of the following operations: addition, subtraction, multiplication, or division. What is the value of $3 \nabla 2$?

(1) $0 \nabla 1 = 1$  
(2) $1 \nabla 0 = 1$

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