1) If $(1/5)^m(1/4)^{18} = 1/2(10)^{35}$, m?
   a. 18
   b. 17
   c. 21
   d. <u>35</u>
   e. 3

2) $(-1)^{k+1}(½^k)$. T is the sum of the first 10 k, is t
   a. > 2
   b. between 1 and 2
   c. between ½ and 1
   d. <u>between ¼ and ½</u>
   e. $< ¼$

3) What is m+n?
   a. 3
   b. 4
   c. <u>5</u>
   d. 6
   e. 7

+	x	y	z
4	1	-5	m
e	7	n	10
f	2	-4	5

4) Perimeter of isosceles right triangle is $16 + 16\sqrt{2}$, what is hypotenuse?
   a. 8
   b. <u>16</u>
   c. $4\sqrt{2}$
   d. $8\sqrt{2}$
   e. $16\sqrt{2}$

5) If it took Carlos 1/2hr from home to library, is distance greater than 6 miles?
   (1mile = 5280 feet) <u>**E**</u>
   a. Average speed was greater than 16 feet/second
   b. Average speed was less than 18 feet/second

6) Does line k intersect quadrant II? **<u>A</u>**
    a. Slope of k is -1/6
    b. Y intercept of k is -6

7) r and s are integers and rs + r is odd, which MUST be even?
    a. r
    b. <u>s</u>
    c. r + s
    d. rs − r
    e. $r^2 + s$

8) Two machine types, Type R and Type S, operate at a constant rate. R does a job in 36 hours. S does same job in 18. If we use the same number of each type to do the job in 2 hours, how many Type r machines do we need?
    a. 3
    b. 4
    c. <u>6</u>
    d. 9
    e. 12

9) If $x \neq 0$, then $\sqrt{x^2}/x$ =
    a. -1
    b. 0
    c. 1
    d. x
    e. <u>|x|/x</u>

10) $2^x - 2^{x-2} = 3(2^{13})$, what is x?
    a. 9
    b. 11
    c. 13
    d. <u>15</u>
    e. 17

11) Is integer r divisible by 3? **<u>A</u>**
    a. R is the product of 4 consecutive positive integers
    b. $r < 25$

12) If # is defined by a # b = a + b − ab, then which is true?

                a # b = b # a
                a # 0 = a
                (a # b) # c = a # (b # c)

    a. I
    b. II
    c. I & II
    d. I & III
    e. I, II & III

13) Lines n and p lie in xy plane. Is slope of line n less than slope of line p? **C**
    a. Lines n and p intersect at (5, 1)
    b. Y-intercept of line n is greater than y intercept of line p

14) Six machines working at the same rate constant rate complete a job in 12 days. How many additional machines working at same rate will be needed to complete the job in 8 days?
    a. 2
    b. 3
    c. 4
    d. 6
    e. 8

15) $10^8 - 10^2 / 10^7 - 10^3$ is closest to which of the following?
    a. 1
    b. 10
    c. 10^2
    d. 10^3
    e. 10^4

16) A basket has 5 apples, one is spoiled. If Henry picked 2 apples simultaneously and at random, what is probability that the 2 selected apples will include the spoiled one.
    a. 1⁄5
    b. 2⁄10
    c. 2⁄5
    d. 1⁄2
    e. 3⁄5

17) On the 1st day the late fine is 0.1. Each additional day the total fine is either increased by 0.3 or doubled whichever is the lesser amount. What is total fine on the 4th day?
    a. 0.6
    b. <u>0.7</u>
    c. 0.8
    d. 0.9
    e. 1.0

18) Of 25 cars sold, some had automatic and some had antilock. How many had automatic but not antilock <u>**E**</u>
    a. All cars that had antilock also had automatic
    b. 2 of the cars that had neither automatic nor antilock

19) Is x between 0 and 1? <u>**B**</u>
    a. x is between -1⁄2 and 3⁄2
    b. 3⁄4 is 1⁄4 more than x

20) If m, r, x & y are positive, is the ratio of m to r equal to the ratio of x to y? <u>**B**</u>
    a. Ratio of m to y is equal to ratio of x to r
    b. Ratio of m + x to r + y equals ratio of x to y

21) How long did it take Helen to drive from home to her parents? <u>**C**</u>
    a. Helen's ave speed was 72Km/h
    b. If Helen's ave speed had been 8km/h faster it would have taken her 1 hour less

22) Each row has same number of chairs and number of rows is 1 less than the number of chairs in a row. How many chairs are in each row? <u>**D**</u>
    a. There are a total of 72 chairs
    b. After 1 chair is removed from last row, there are 17 chairs in the last 2 rows

23) Alice's take home pay was the same each month and she saved the same fraction each month. The total amount she saved at the end of the year was 3 times the amount of that portion of her monthly take home that she did not save. If all the money that she saved last year was from her take home pay, what fraction of her take home pay did she save each month.
   a. 1⁄2
   b. 1⁄3
   c. 1⁄4
   d. 1⁄5
   e. 1⁄6

24) n is an integer between 10 and 99, is n< 80? **B**
   a. Sum of the two digits on n is a prime number
   b. Each of the two digits of n is a prime number

25) During a one day sale, a store sold each sweater for $30 more than the cost of purchase. How many were sold during the sale? **C**
   a. Total revenue for sweaters is $270
   b. Store sold each sweater for 50% more than the cost of purchase.

26) If the average of five numbers, x, 7, 2, 16, and 11 = the median, what is x? **D**
   a. 7 < x > 11
   b. x is median of the five numbers

27) If everyone was charged the same fee, how many people came? **C**
   a. If the fee had been %0.75 less and 100 more people came the club would have received the same amount.
   b. If fee had been $1.50 more and 100 fewer people came, the club would have received the same amount

28) On the number line, the distance between x and y is greater than the distance between x and z. Does z lie between x and y on the number line? **E**
   a. xyz < 0
   b. xy < 0

29) If xyz > 0, is x > 0? **C**
   a. xy > 0
   b. xz > 0

30) $2^{(4-1)^2} / 2^{3-2}$

    a. 2^8

    b. 2^7

    c. 2^6

    d. 2^5

    e. 2^4

31) If n is a positive integer less than 200 and $14n/60$ is also an integer, then n has how many different positive prime factors

    a. 2

    b. 3

    c. 5

    d. 6

    e. 8

32) Are at least 10% of people 65 and older employed? **B**

    a. 11.3% of population is 65 or over

    b. Of those 65 and older, 20% of mean and 10% of women are employed.

33) The difference between Mary and Jim's salary was twice the difference between Mary and Kate's. If Mary had the highest salary, what was the average of the three? **B**

    a. Jim's salary was $30,000

    b. Kate's was $40,000

34) If xy = 1, what is value of $2^{(x+y)^2} / 2^{(x-y)^2}$

    a. 2

    b. 4

    c. 8

    d. 16

    e. 32

35) If r and s are positive integers, is r/s an integer? **A**

    a. Every factor of s is also a factor of r

    b. Every prime factor of s is also a prime factor of r

36) For a finite set of nonzero numbers, the number of variations in sign is defined as the number of pairs of consecutive terms of the sequence for which the product of the consecutive terms is negative. What is the number of variations in sign for the sequence 1, -3, 2, 5, -4, -6?

    a. 1
    b. 2
    c. 3
    d. 4
    e. 5

37) Circular gears P & Q start rotating at the same time at constant speeds. Gear P rotates at 10 revs/min and gear Q at 40 revs/min. How many seconds after gears start rolling will Q have made exactly 6 more revs than P

    a. 6
    b. 8
    c. 10
    d. 12
    e. 15

38) Is x less than 20? **E**
    a. Sum of x and y is less than 20
    b. y is less than 20

39) In isosceles triangle RST, what is measure of angle R? **A**
    a. Angle T is 100º
    b. Angle S is 40º

40) Some water was removed from each of 6 tanks. If standard deviation of the volumes of water at the beginning was 10 gallons, what was the standard deviation of the volumes at the end? **A**
    a. For each tank, 30% of water at the beginning was removed
    b. The average volume of water in the tanks at the end was 63 gallons

41) A serving requires 1½ cups of pasta. How many cups of pasta will he use this time? **C**
    a. He makes half as many servings as he did last time
    b. He used 6 cups of pasta the last time

42)

```
    L        M
   ┌────┬───┐
   │    │   │
   │    │   │
   ├────┴───┤
   │        │
   └────────┘
    K        N
```
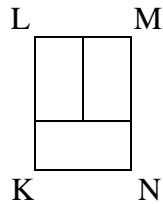
In this figure, what is ratio KN/MN? **B**
   a. Perimeter of KLMN is 30
   b. All three rectangles have the same dimensions

43) The rate of a reaction is directly proportional to the square of the concentration of A and inversely proportional to concentration of B. If B increases by 100%, which of the following is closest to the % change in concentration of A required to keep the rate unchanged?
   a. 100% decrease
   b. 50% decrease
   c. 40% decrease
   d. 40% increase
   e. 50% increase

44) PQ is parallel to OR. OR = 18. What is the length of minor arc PQ **[DON'T DO]**
   a. 2π
   b. $9\pi/4$
   c. $7\pi/2$
   d. $9\pi/2$
   e. 3π

45) A list of measurements in increasing order is 4, 5, 6, 8, 10, and x. If median of the measurements is 6/7 times the mean, what is the value of x?
   a. 16
   b. 10
   c. 12
   d. 13
   e. 15

46) Which of the following is and integer?

        12!/6!

        12!/8!

        12!/7!5!

    a. I

    b. II

    c. III

    d. I & II

    e. **I, II & III**

47) Three grades of milk: 1%, 2%, and 3% fat by volume. X gallons of 1%, y gallons of 2%, and z gallons of 3% are mixed to give x + y + z gallons of 1.5%. What is x in terms of y and z?

    a. y + 3z

    b. (y + z)/4

    c. 2y + 3z

    d. 3y + z

    e. 3y + 4z

48) n and m are positive integers, what is remainder when $3^{4n+2} + m$ is divided by 10?

B

    a. n = 2

    b. m = 1

49) In the xy plane, at what point does y = (x + a)(x + b) cross the x axis? **C**

    a. a + b = -1

    b. graph intersects y axis at (0, -6)

50) If x and y are integers greater than 1, is x a multiple of y? **A**

    a. $3y^2 + 7y = x$

    b. $x^2 - x$ is a multiple of y

51) At 50 mph a car uses 1 gallon for every 30 miles. If the car starts with a full tank of 12 gallons and drives for 5 hrs at 50mph, the amount of gas used would be what fraction of the tank?

    a. 3/25

    b. 11/36

    c. 7/12

    d. 2/3

    e. **25/36**

52) If $M = \sqrt{4} + \sqrt[3]{4} + \sqrt[4]{4}$, the value of M is
   a. < 3
   b. = 3
   c. 3 < M < 4
   d. = 4
   e. ≥ 4

53) 2 sizes of sticky pads. Each has 4 colors – Blue, Green, Yellow, and Purple. The pads are packed in packages that contain either 3 notepads of same size and same color or 3 notepads of same size and of 3 different colors. How many different packages of the types described are possible?
   a. 6
   b. 8
   c. 16
   d. 24
   e. 32

54) If the operation @ is one of + - * or /, is (6 @ 2) @ 4 = 6 @ (2 @ 4) **A**
   a. 3 @ 2 > 3
   b. 3 @ 1 = 3

55) What is the value of n? **B**
   a. N is between 0 and 1
   b. 7/16 is 3/8 more than n

56) Martha bought an armchair and a coffee table at an auction and sold both. Her gross profit from purchase and sale of armchair was what % greater than gross profit from purchase and sale of coffee table? **E**
   a. She paid 10% more for armchair than table
   b. She sold armchair for 20% more than she told the table

57) x, y, and z are integers greater than 1, what is value of x + y + z? **A**
   a. xyz = 70
   b. x/yz = 7/10

58) Is z equal to the median of the 3 positive integers x, y & z? **B**
      a. $x < y + z$
      b. $y = z$

59) M orders 50 computers and printers. N orders 60 computers and printers. How many computers did M order? **E**
      a. M & N ordered the same number of computers
      b. N ordered 10 more printers than M

60) $(8^2)(3^3)(2^4) / 96^2 =$
      a. 3
      b. 6
      c. 9
      d. 12
      e. 18

61) If $xy + z = x(y + z)$, which must be true?
      a. $x = 0; z = 0$
      b. $x = 1; y = 1$
      c. $y = 1; z = 0$
      d. $x = 1$ or $y = 0$
      e. $x = 1$ or $z = 0$

62) Area of triangle PQR is what fraction of triangle LMN **[DON'T DO]**
      a. 1⁄9
      b. 1⁄8
      c. 1⁄6
      d. 1⁄5
      e. 1⁄3

63) S is finite set of numbers. Does S contain more negative numbers than positive numbers? **E**
      a. Product of all numbers in S is -1200
      b. There are 6 numbers in S

64) Each employee is either a director or a manager. What % of the employees are directors? **C**
   a. The average salary of managers is $5000 less than the average of all employees
   b. The average salary of directors is $15000 greater than the average of all employees

65) The ratio of women to children on a tour is 5:2. How many men are there? **C**
   a. Ratio of children to women is 5:11
   b. There are less than 30 women on the tour.

66) In the figure P and Q lie on circle with center Q, what is s? **[DON'T DO]**
   a. $1/2$
   b. 1
   c. $\sqrt{2}$
   d. $\sqrt{3}$
   e. $\sqrt{2}/2$

67) n and y are positive integers and $450y = n^3$, which is an integer?
   $y / 3 * 2^2 * 5$
   $y / 3^2 * 2 * 5$
   $y / 3 * 2 * 5^2$
   a. None
   b. I
   c. II
   d. III
   e. I, II, III

68) A thin piece of 40 m wire is cut in two. One piece is a circle with radius of r. Other is a square. No wire is left over. Which represents total area of circle and square in terms of r?

    a. Πr^2
    b. $\Pi r^2 + 10$
    c. $\Pi r^2 + \frac{1}{4}\,\pi^2 r^2$
    d. $\Pi r^2 + (40 - 2\pi r)^2$
    e. $\underline{\Pi r^2 + (10 - \frac{1}{2}\,\Pi r)^2}$

69) Harry bought a desk for $150. Selling price was purchase price plus markup that was 40% of selling price. What is gross profit?

    a. 40
    b. 60
    c. 80
    d. 90
    e. <u>100</u>

70) If $x^4 + y^4 = 100$, the greatest possible value of x is between

    a. <u>0 and 3</u>
    b. 3 and 6
    c. 6 and 9
    d. 9 and 12
    e. 12 and 15

71) If each term in the series $a_1 + a_2 + \ldots a_n$ is either 7 or 77, and the sum equals 350, which of the following could be equal to n?

    a. 38
    b. 39
    c. <u>40</u>
    d. 41
    e. 42

72) What is the remainder when positive integer x is divided by 3? **<u>D</u>**

    a. When x is divided by 6 remainder is 2
    b. When x is divided by 15, remainder is 2

73) In xy plane, what is y-intercept of l? **<u>E</u>**

    a. Slope of l is 3 times the y intercept
    b. x-intercept of l is -⅓

74) Sum of positive integers x and y is 72. What is xy? **D**
    a. x = y + 1
    b. x and y have same tens digit

75) Is x > 0.05? **D**
    a. x > 3/40
    b. x > 3% of 50

76) Al, Pablo, and Masha shared driving on a 1,500 mile trip. Who drove greatest distance? **E**
    a. Al drove 1 hr longer than Pablo but at an average speed of 5 mph slower than Pablo
    b. Masha drove 9 hrs and averaged 50 mph

77) If d is standard deviation of x, y, and z, what is standard deviation of x + 5, y + 5, and z + 5?
    a. d
    b. 3d
    c. 15d
    d. d + 5
    e. d + 15

78) x and y are positive, what is x + y? **D**
    a. $2^x 3^y = 72$
    b. $2^x 2^y = 32$

79) What is the % increase in population of City K from 1980 to 1990? **B**
    a. In 1970 population of K was 160,000
    b. In 1980 population of K was 20% greater than 1970 and in 1990 population is 30% greater than in 1970

80) Which is equal to $2^5 + 2^5 + 3^5 + 3^5 + 3^5$?
    a. 5^6
    b. 13^5
    c. $2^6 + 3^6$
    d. $2^7 + 3^8$
    e. $4^5 + 9^5$

81) If x is negative integer, which of the following has the least value?
   a. $x^2 - 0.50$
   b. $x^2 - 0.51$
   c. $x^3 - 0.502$
   d. $x^3 - 0.511$
   e. $x^4 - 0.512$

82) The main ingredients in a capsule is \$500/kilo. Each capsule has 600 milligrams per capsule, what is the cost of the ingredient in a capsule? (1 kilo = 10^6 milligrams)
   a. \$0.30
   b. \$0.83
   c. \$1.20
   d. \$3.00
   e. \$3.33

83) Is x < 20? **E**
   a. $x + y < 20$
   b. $y < 20$

84) PRS is how many degrees greater than PQR? **[DON'T DO] D**
   a. QPR is 30º
   b. PQR +PRQ is 150º

85) What fraction of graduating students at college X are male? **C**
   a. 33% of males and 20% of females transferred from another college
   b. 25% of all students transferred

86) Did it take Pei more than 2 hours to walk a distance of 10 miles? (1 mile = 1.6km)
   D
   a. Pei walked at an average rate of less than 6.4 kmh
   b. On average, it took Pei more than 9 mins/km to walk this distance

87) Equilateral triangle ABC is inscribed. If arc ABC is 24, what is diameter?
    [DON'T DO]
        a. 2
        b. 8
        c. 11
        d. 15
        e. 19

88) For how many integers n is $2^n = n^2$
        a. None
        b. 1
        c. 2
        d. 3
        e. More than 3

89) What is GCD of positive integers m and n? **C**
        a. m is a prime number
        b. $2n = 7m$

90) For which of the following functions is $f(x) = f(1-x)$ for all x?
        a. $f(x) = 1 - x$
        b. $f(x) = 1 - x^2$
        c. $f(x) = x^2 - (1 - x)^2$
        d. $f(x) = x^2(1 - x)$
        e. $f(x) = x / x/1 - x$

91) If $z^n = 1$, what is value of z? **C**
        a. n is a nonzero integer
        b. $z > 0$

92) If $x > y^2 > z^4$, which of the following could be true?

         $x > y > z$
         $z > y > x$
         $x > z > y$

    a. I
    b. I and II
    c. I and III
    d. II and III
    e. <u>I, II, and III</u>

93) Each stack is designated with a 1, 2, and 3 letter code where each letter is selected from the 26 letters of the alphabet. If the letters may be repeated and if the same letters used in a different order constitutes a different code, how many different stocks is it possible to uniquely designate with these codes?
    a. 2951
    b. 8125
    c. 15600
    d. 16302
    e. <u>18278</u>

94) Dealer sold 1 car at a profit of 25% of purchase price, and sold another car at a loss of 20% of purchase price. If dealer sold each car for $20000, what was dealer's total profit or loss in dollars for the 2 transactions combined?
    a. 1000 profit
    b. 2,000 profit
    c. <u>1000 loss</u>
    d. 2000 loss
    e. 3334 loss

95) Each employee of company Z is employed in either Division X or Division Y, but not both. If each division has some part time employees, is the ratio of the number of full-time employees to number of part-time employees greater for Division X than for Company Z? **<u>D</u>**
    a. Ratio of number of full time employees to part-time employees is less for division Y than for company Z
    b. More than ½ of full-time employees of company Z are employees of div X, and more than ½ of part-time employees of company Z are employees of div Y

96) X and Y work at constant rates, how many more hours does it take machine y, alone, to fill an order of a certain size than machine X alone. **E**
    a. X and Y together fill order in 2⁄3 the time that X alone does
    b. Y alone does it in twice the time as X alone does

97) When a tree was planted it was 4 feet. Its height increased by a constant amount each year for 6 years. After 6 years the tree was 1⁄5 taller than at the end of 4th year. By how many feet did the height of the tree increase each year?
    a. 3⁄10
    b. 2⁄5
    c. 1⁄2
    d. 2⁄3
    e. 6⁄5

98) Positive integers x, y, and z are such that x is a factor of y and y is a factor of z, if z even? **D**
    a. xz is even
    b. y is even

99) If x is a positive number less than 10, is z greater than average of x and 10? **A**
    a. z is closer to 10 than x on the number line
    b. z = 5x

100)   Of 1400 college teachers surveyed, 42% said they considered research essential. How many teachers surveyed were women? **A**
    a. In survey 36% of men and 50% of women said they considered research essential
    b. 288 men said they considered research essential

101)   On the number line, if k is to the left of t, is kt to the right of t? **A**
    a. $t < 0$
    b. $k < 1$

102)   If $5^{21} * 4^{11} = 2 * 10^{n}$, what is n?
    a. 11
    b. 21
    c. 22
    d. 23

e. 32

103)   If $0 < r < 1 < s < 2$ which must be less than 1?

r/s

rs

s − r

a. **I**
b. II
c. III
d. I and II
e. I and III

104)   For every positive even integer n, the function h(n) is defined to be the product of all even integers from 2 to n inclusive. If p is the smallest prime factor of h(100) + 1, then p is between
a. 2 and 10
b. 10 and 20
c. 20 and 30
d. 30 and 40
e. **> 40**

105)   If radius is 1 and BC is 1, what is area of triangle? **[No diagram. Don't do]**
a. $\sqrt{2}/2$
b. **$\sqrt{3}/2$**
c. 1
d. $\sqrt{2}$
e. $\sqrt{3}$

106)   Are x and y both positive? **C**
a. $2x − 2y = 1$
b. $x/y > 1$

107)   ABCD are on the number line… not in that order. If A→B is 18 and C→D is 8, what is B→D? **E**
a. Distance C→A is the same as C→B

b. A is to the left of D on the number line

108) 75 can be written as the sum of the squares of 3 different positive integers. What is sum of these integers?
   a. 17
   b. 16
   c. 15
   d. 14
   e. 13

109) If p is positive integer, what is remainder when p is divided by 4? **D**
   a. When P is divided by 8 remainder is 5
   b. P is the sum of the squares of two consecutive positive integers.

110) Is m + z > 0 **C**
   a. m − 3z > 0
   b. 4z − m > 0

111) 5 people are seated around a round table. Two seating arrangements are considered different only when the positions of the people are different relative to each other. What is the total number of different possible seating arrangements for the group?
   a. 5
   b. 10
   c. 24
   d. 32
   e. 120

112) Jim invested $1000 @ 10% compounded annually. Laura invested $2000 @ 5% compounded annually. Total interest of Jim is how much more than total interest of Laura after 2 years?
   a. 5
   b. 15
   c. 50
   d. 100
   e. 105

113)   When 1000 kids were inoculated, some got inflammation, others got fever. How many developed inflammation but not fever. **C**
   a. 880 developed neither inflammation nor fever
   b. 20 children developed fever

114)   Is x between 0 and 1? **B**
   a. x is between -1/2 and 3/2
   b. ¾ is ¼ more than x

115)   Jack and Mark both received hourly wage increases of 6%. After this increase, jack's Hourly wage was how many dollars per hour more than Mark's? **A**
   a. before the increase Jack's hourly wage was $5 per hour more than Mark's
   b. before the increase, the ratio of Jack to Mark was 4:3

116)   Linda put money in two investments A and B which paid simple interest. If annual interest rate of investment B is 1½ times that of A, what amount did Linda put into A? **E**
   a. Interest for 1 year is $50 for A and %150 for B
   b. Linda put twice the amount of A into B

117)   Kaye and Al have stamps in ratio 5:3. After Kaye gave Al 10 stamps the ratio of Kaye to Al is 7:5. How many more stamps does Kaye have than Al after the gift?
   a. 20
   b. 30
   c. 40
   d. 60
   e. 90

118)   A set of 15 different integers has median of 25 and a range of 25. What is greatest possible integer that could be in this set?
   a. 32
   b. 37
   c. 40
   d. 43
   e. 50

119)   How many odd integers are greater than integer x and less than integer y?
B
   a. There are 12 even integers greater than x and less than y
   b. There are 24 integers greater than x and less than y

120)   A contractor combined x tons of gravel mix that contained 10% gravel G
   by weight, with y tons of a mixture that contained 2% gravel G by weight to
   produce z tons of a mixture that was 5% gravel G by weight. What is the value of
   x? **D**
   a. $y = 10$
   b. $z = 16$

121)   If s and t are two different numbers on the no. line, is $s + t = 0$? **A**
   a. Distance from s to 0 is the same as the distance from t to 0
   b. 0 is between s and t

122)   Ratio of TAs to students in any course must always be greater than 3:80,
   what is the maximum number of students possible in a course with 5 TAs?
   a. 130
   b. 131
   c. 132
   d. 133
   e. 134

123)   If n is multiple of 5, and $n = p^2q$ where p and q are prime, which of the
   following must be a multiple of 25?
   a. p^2
   b. q^2
   c. pq
   d. p^2q^2
   e. p^3q

124)   Before being simplified, the instructions for computing the income tax in
   Country K were to add 2% of annual income to average of 100 units of Country
   K's currency and 1% of annual income. Which represents the simplified formula
   for computing income tax for a person with an annual income I?
   a. $50 + I/200$
   b. $50 + 3I/100$
   c. $50 + I/40$

d. $50 + I/50$

e. $50 + 3I/100$

125)   If n is a positive integer and r is remainder when $(n-1)(n+1)$ is divided by 24, what is the value of r? **C**

a. n is divisible by 2

b. n is not divisible by 3

126)   Last month 15 homes were sold in Town X. The average sale price of the houses was $150,000 and the median sales price was $130,000. Which must be true?

At least 1 house sold for $> \$165,000$

At least 1 house sold for $> \$130,000$ but $< \$150,000$

At least 1 home sold for $< \$130,000$

a. I

b. II

c. III

d. I and II

e. I and III

127)   A seminar consisted of morning session and afternoon session. If each of the 128 people attending attended at least one of the two sessions, how many of the people attended the morning session only? **B**

a. ¾ attended both sessions

b. 7/8 attended the afternoon session

128)   If $1000 is deposited, the dollar amount of interest I earned in the first n years is given by $I = 1000[(1+r/100)^n - 1]$ where r is the annual interest rate paid by the bank. Is the annual interest rate greater than 8%? **A**

a. The $1000 deposit earns a total of $210 in interest in the first 2 years

b. $(1+r/100)^2 > 1.15$

129)   Did one of three member of a certain team sell at least 2 raffle tickets yesterday? **D**

a. The 3 sold a total of 6 raffle tickets

b. No 2 members sold the same number of tickets

130)   Positive integer k has exactly 2 positive prime factors, 3 and 7. If k has a total of 6 positive factors, including 1 and k, what is the value of k? **D**

a. 3^2 is a factor of k

b. 7^2 is not a factor of k

131)   If the terms of a sequence are $t_1, t_2, \ldots t_n$, what is value of n? **C**

a. Sum of the n terms is 3124

b. Average of the n terms is 4

132)   In sequence $a_n = a_{n-1} + k$, where $2 \le n \le 15$ and k is a nonzero constant. How many of the terms in the sequence are greater than 10? **B**

a. $a_1 = 24$

b. $a_8 = 10$

133)   A firm has 4 senior partners and 6 junior partners. How many different groups of 3 partners can be formed in which at least one member of the group is a senior partner. (2 groups are considered different if at least one group member is different)

a. 48

b. 100

c. 120

d. 288

e. 600

134)   At least 100 students study Japanese. If 4% of students who study French also study Japanese, do more students study French than Japanese? **B**

a. 16 students study both French and Japanese

b. 10% of students at school who study Japanese also study French

135)   A company was paid $500,000. The costs were Labor & Materials. Was the company's profit greater than $150,000? **C**

a. Total cost was three times cost for materials

b. Profit was greater than cost of labor

136)   In the sequence of positive numbers x_1, x_2, x_3, what is the value of x? **C**

a. $x_j = x_{j-1}/2$

b. $x_5 = x_4/x_4 + 1$

137)   The average no. of years of experience is 9.8 yrs for males and 9.1 yrs for females. What is ratio of no. of males to females? **B**

a. There are 52 males

b. Ave no. of years of experience for both males and females together is 9.3

138)   If integer n is > 1, is n = 2? **B**
   a. n has exactly 2 positive factors
   b. The difference of any 2 distinct positive factors of n is odd

139)   If n is positive, which of the following could be the correct ordering of 1/x, 2x, and x^2? **D**
   $$x^2 < 2x < 1/x$$
   $$x^2 < 1/x < 2x$$
   $$2x < x^2 < 1/x$$
   a. None
   b. I
   c. III
   d. I and II
   e. I, II, and III

140)   A company assigns ID number to employees. Each is to consist of 4 different digits from 0 to 9 inclusive except 1st digit cannot be 0. How many different combinations are there?
   a. 3024
   b. 4536
   c. 5040
   d. 9000
   e. 10000

141)   The cost of a square slab of concrete is proportional to the thickness and also proportional to the square of the length. What is the cost of square slab that is 3 meters long and 0.1 meters thick? **D**
   a. 2m long by 0.2m thick is $160 more than 2m long by 0.1m thick
   b. 3m long by 0.1m thick is $200 more than 2m long by 0.1m thick

142)   If Bob makes 36 or fewer items in a week, he is paid x dollars per item. If Bob produces more than 36 items in a week, he is paid x dollars per item for 1st 36 and 1.5x for each additional item. How many items did he produce last week?
   E
   a. Last week Bob was paid a total of $480
   b. This week Bob made 2 more items than last week and was paid a total of $150

143)   List k consists of 12 consecutive integers. If -4 is the least integer in list K, what is the range of positive integers in list K?
  a. 5
  b. 6
  c. 7
  d. 11
  e. 12

144)   If k is a positive integer, then 20k is divisible by how many different positive integers? **B**
  a. k is prime
  b. k is 7

145)   For the set on n numbers where n > 1, is the average equal to the median? **A**
  a. If n is listed in increasing order, then the difference between any pair of successive numbers is 2
  b. The range of the n numbers in the set is 2(n-1)

146)   In the arithmetic sequence t_1, t_2, ….t_n, t_1 = 23 and t_n = t_{n-1} − 3 for each n > 1, what is n when t_n = -4? **C**
  a. -1
  b. 7
  c. 10
  d. 14
  e. 20

147)   At a company employees are either managers or directors, what percentage of employees are directors? **C**
  a. The average salary of managers is $5000 less than average of all employees
  b. The average salary of directors is $15000 greater than average salary of all employees.

148)   In xy plane, does the line y = 3x + 2 contain point (r, s)? **C**
  a. (3r + 2 −s)(4r + 9 − s) = 0
  b. (4r − 6 − s)(3r + 2 − s) = 0

149)   Of 75 houses, 48 have a patio. How many houses have a swimming pool?
  B

a. 38 houses have a patio but no swimming pool
b. Number of houses that have a swimming patio and a swimming pool is equal to the number of houses that have neither pool nor patio

150)   A city with population 132000 is to be divided into 11 voting districts, and no district is to have a population that is more than 10% greater than population of any other district. What is minimum possible population of the least populated district?
   a. 10700
   b. 10800
   c. 10900
   d. 11000
   e. 11100

151)   How many different prime numbers are factors of positive integer n? **B**
   a. 4 different prime numbers are factors of 2n
   b. 4 different prime numbers are factors of n^2

152)   Harry bought 3 items and got 20% discount off regular price of most expensive item and 10% discount off regular price of the other two. Was the total amount of the 3 discounts greater than 15% of the sum of the regular prices of the 3 items? **A**
   a. Regular price of most expensive item was $50 and regular price of next most expensive was $20
   b. Regular price of least expensive item was $15

153)   Distance between x and y is greater than distance between x and z. Does z lie between x and y on the number line? **A**
   a. $xyz < 0$
   b. $xy < 0$

154)   Angela's grade was in the 90th percentile out of 80 grades in her class. In another class there were 19 grades higher than Angela's. If nobody had Angela's grade, then Angela was what percentile of the two classes combined?
   a. 72
   b. 80
   c. 81
   d. 85
   e. 92

155)   X is the sum of even integers from 40 to 60 inclusive and y is the number of even integers from 40 to 60 inclusive, what is x + y?
  a. 550
  b. 551
  c. 560
  d. 561
  e. 572

156)   If n and p are integers, is p > 0? **C**
  a. n + 1 > 0
  b. np > 0

157)   If ab ≠ 0 and (-a, b) and (-b, a) are in the same quadrant, is (-x, y) in this quadrant? **C**
  a. xy > 0
  b. ax > 0

158)   Jan has only b black, w white and r red marbles. If 1 marble is chosen at random, is probability that the marble chosen will be red greater than probability that marble chosen is white? **A**
  a. r/b+w > w/b+r
  b. b − w > r

159)   In xy coordinate plane, line l and line k intersect at point (4, 3). Is product of the slopes negative? **C**
  a. Product of x intercepts of lines l and k is positive
  b. Product of y intercepts of lines l and k is negative

160)   Ratio of fuel bill for Feb to Jan is 3/2. If Feb bill had been $40 more, the corresponding ratio would have been 5/3. How much was Jan bill?
  a. 240
  b. 300
  c. 360
  d. 450
  e. 540

161) $2 + 2 + 2^2 + 2^3 + 2^4 + 2^5 + 2^6 + 2^7 + 2^8 =$
  a. 2^9
  b. 2^{10}
  c. 2^{16}

d. 2^{35}
e. 2^{37}

162) $x < 0$, then $\sqrt{-x}\ |x|$ (root of the whole expression)
   a. -x
   b. -1
   c. 1
   d. X
   e. $\sqrt{x}$

163)   If each pencil is either 23 cents or 21 cents, how many 23 cent pencils did Martha buy? **B**
   a. Martha bought a total of 6 pencils
   b. Total value of pencils Martha bought was 130 cents

164)   Are positive integers p and q both greater than n? **C**
   a. p - q > n
   b. q > p

165)   Is the hundredths digit of decimal d greater than 5? **D**
   a. Tenths digit of 10d is 7
   b. Thousandths digit of d/10 is 7

166)   Sum of 1st 50 positive integers is 2550. What is sum of even integers from 102 to 200 inclusive?
   a. 5100
   b. 7550
   c. 10100
   d. 15500
   e. 20100

167)   What is greatest prime factor of $4^{17} - 2^{28}$?
   a. 2
   b. 3
   c. 5
   d. 7
   e. 11

168)   Some students are Part time (PT). The rest are full time (FT). By what %
did number of FT students enrolled increase from fall of 1999 to fall of 2000? **E**
    a. There were 50 more students enrolled at the college in 2000 than in 1999
    b. Total number of students enrolled increased by 5% from 1999 to 2000

169)   If $zt < -3$, is $z < 4$? **E**
    a. $z < 9$
    b. $t < -4$

170)   If c and d are integers, is c even? **C**
    a. $c(d +1)$ is even
    b. $(c+2)(d+4)$

171)   Is $z = 20q$? **B**
    a. $q = 3$
    b. Each value other than q is equal to the sum of the value immediately
        above it and immediately to the left of it.

q	q	q	q
q	r	s	t
q	u	v	w
q	x	y	z

172)   Jackie bought paperbacks at $8 each and hardcovers at $25 each. If J
bought more than 10 paperbacks, how many hardcover books did he buy? **C**
    a. Total cost of hardcover was at least $150
    b. Total cost of all books J bought was < 260

173)   If $ax + b = 0$, is $x > 0$? **E**
    a. $a + b > 0$
    b. $a - b > 0$

174)   If 11 consecutive integers are listed from least to most, which is the mean
of the 11 digits? **D**
    a. Average of the first 9 digits is 7
    b. Average of last 9 digits is 9

175)   How long did it take to travel 400km? **B**
   a. The car travelled the first 200km in 2.5hrs
   b. If the car's average speed had been 20 km/h faster, it would have travelled the 400km in 1 hour less time.

176)   n questions can either be true or false. If you answer all n correct you win. What is the least value of n for which the probability is less than 1/1000 for you to win by guessing randomly?
   a. 5
   b. 10
   c. 50
   d. 100
   e. 1000

177)   Sales tax is 8%. If sales tax had been only 5% Connie would have paid $12 less sales tax. What was the total amount that Connie paid for the purchase including sales tax?
   a. 368
   b. 380
   c. 400
   d. 420
   e. 432

178)   5 pieces of wood have an average length of 124cm and median length of 140cm. what is the maximum possible length of the shortest piece of wood?
   a. 90
   b. 100
   c. 110
   d. 130
   e. 140

179)   A car averages 25 mpg in city and 40 mpg on highway. Which of the following is closest to the number of mpg that the car averages when it drives 10 miles in city and then 50 miles on highway?
   a. 28
   b. 30
   c. 33
   d. 36
   e. 38

180)   If $xy + k = k$ and $x \neq 0$, which must be true?
  a. $x > y$
  b. $x + y = 0$
  c. **$y = 0$**
  d. $|x - y| = 0$
  e. $xy = 1$

181)   The function f is defined for all the integers n by f(n) is the number of positive integers each of which is less than n and has no positive factor in common with n other than 1. If p is any prime number, then f(p) =?
  a. **$p - 1$**
  b. $p - 2$
  c. $p+2 / 2$
  d. $p-1 / 2$
  e. 2

182)   What is the ratio of the number of cups of flour to number of cups of sugar required in a certain recipe? **A**
  a. No. of cups of flour required in the recipe is 250% of the no. of cups of sugar
  b. 1½ more cups of flour than sugar are required

183)   If $x - y > 10$, is $x - y > x + y$? **D**
  a. $x = 8$
  b. $y = -20$

184)   In xy plane, line k passes through (1,1) and m through (1, -1). Are lines k and m perpendicular? **E**
  a. k and m intersect at (1, -1)
  b. k intersects x –axis at (1, 0)

185)   Each adult ticket costs $30, and each child ticket costs $24. What is the mean cost per ticket? **A**
  a. You buy 2 times as many child tickets as adult tickets
  b. You buy 4 child tickets

186)   Distance between A and C on the number line is 5. Distance between B
and C is 20. Does C lie between A and B? **A**
  a. Distance between A and B is 25
  b. A lies to the left of B

187)   P, K and M charged a total of 162 hours to a project. If P charged 2 times
K and 1/3 M, how many more hours did M charge to the project than K?
  a. 90
  b. 70
  c. 18
  d. 6
  e. 3

188) $(-3)^{-2} =$
  a. -9
  b. -6
  c. -1/9
  d. 1/9
  e. 9

189)   T coworkers agreed to share equally the cost of lunch. If lunch costs x
dollars an S of the coworkers did not pay their share, which represents the
additional amount that each of the remaining coworkers must contribute to pay for
the lunch?
  a. x/T
  b. x/T- x
  c. Sx/T-s
  d. Sx/T(T-S)
  e. X(T-S)/T

190)   If $mv < pv < 0$, is $v > 0$? **D**
  a. $m < p$
  b. $m < 0$

191)   Of 4800 voters who voted for Resolution K, 1800 were Democrat and
3000 were Republican. What was the total number of female voters who voted for
Resolution K? **C**

a. ¾ of Democrats & 2/3 of Republicans voted for Resolution K
b. 1/3 of Democrats who voted for Resolution K and ½ of Republicans who voted for Resolution K were female

192) What is the total surface area of rectangular solid R? **E**
a. Surface area of one of the faces is 48
b. Length of one of the edges is 3

193) If k and t are integers, and $k^2 - t^2$ is an odd integer, which must be even?
$$k + t + 2$$
$$k^2 + 2kt + t^2$$
$$k^2 + t^2$$
a. **None**
b. I
c. II
d. III
e. I, II, and III

194) Revenue from the sale of sofas was what % greater this year than last year? **E**
a. We sold 10% more sofas this year than last year
b. Selling price per sofa was $30 greater this year than last

195) r and t are positive integers, is rt even? **A**
a. r + t is odd
b. r^t is odd

196) Of 200 members, each member who speaks German also speaks English, and 70 of members only speak Spanish. If no member speaks all 3 languages, how many of the members speak 2 of the 3 languages? **C**
a. 60 members speak only English
b. 20 members do not speak any of the 3 languages

197) A store sells chairs individually or in sets of 6. The store charges less for purchasing a set of 6 chairs than for purchasing 6 chairs individually. How much does the store charge for purchasing a set of 6 chairs? **C**
a. Buying a set of 6 is 10% less than buying 6 individually

b. Buying a set of 6 is $20 more than buying 5 individually

198)　　　All the clients that company x had at the beginning of the year remained with the company for the whole year. If Company x acquired new clients during the year, what was the ratio of number of clients that Company X had at the end to no. of clients that Company X had at the beginning of the year? **A**
   a. Ratio of no. of clients that Company X had at beginning of last year to no. of new clients that it acquired during the year was 12 to 1.
   b. Company X had 144 clients at beginning of last year