

1. The total amount that Mary paid for a book was equal to the price of the book plus a sales tax that was 4 percent of the price of the book. Mary paid for the book with a \$10 bill and received the correct change, which was less than \$3.00. Which of the following statements must be true?

Indicate all such statements.

- A. The price of the book was less than \$9.50.
- B. The price of the book was greater than \$6.90.
- C. The sales tax was less than \$0.45.

2. Let S be the set of all positive integers n such that n^2 is a multiple of both 24 and 108. Which of the following integers are divisors of every integer n in S ?

Indicate all such integers.

- A. 12
- B. 24
- C. 36
- D. 72

3. In a graduating class of 236 students, 142 took algebra and 121 took chemistry. What is the greatest possible number of students that could have taken both algebra and chemistry?

4. What is the ratio of the number of people in group 2 with the ailment sneezing and itchy eyes to the total number of people in both groups with the ailment sneezing and itchy eyes?

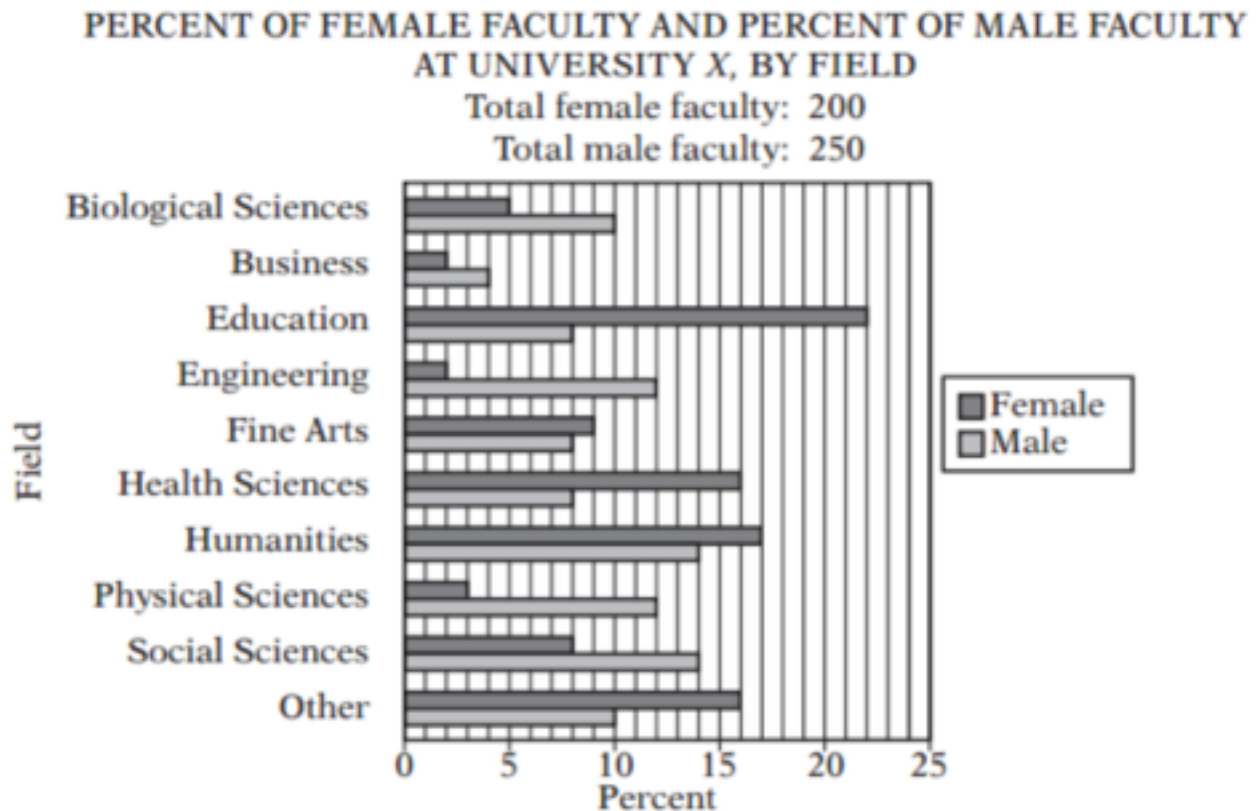
Give your answer as a fraction.

**PERCENT OF THE 300 PEOPLE IN GROUP 1 AND THE 400 PEOPLE
IN GROUP 2 WHO HAVE SELECTED AILMENTS**

Respiratory Ailment	Percent of People in Group 1 Who Have Ailment	Percent of People in Group 2 Who Have Ailment
Allergic sensitivity to endotoxins	14%	21%
Asthma (allergic)	3%	4%
Asthma (nonallergic)	2%	3%
Hay fever	4%	10%
Sneezing and itchy eyes	8%	11%
Wheezing (allergic)	5%	6%
Wheezing (nonallergic)	2%	5%

5. For the biological sciences and health sciences faculty combined, $\frac{1}{3}$ of the female and $\frac{2}{9}$ of the male faculty members are tenured professors. What fraction of all the faculty members in those two fields combined are tenured professors?

Give your answer as a fraction.



6. In the xy -plane, line k is a line that does not pass through the origin.

Which of the following statements individually provide(s) sufficient additional information to determine whether the slope of line k is negative?

Indicate all such statements.

- A. The x -intercept of line k is twice the y -intercept of line k .
- B. The product of the x -intercept and the y -intercept of line k is positive.
- C. Line k passes through the points (a, b) and (r, s) , where $(a-r)(b-s) < 0$.

7. The company at which Mark is employed has 80 employees, each of whom has a different salary. Mark's salary of \$43,700 is the second-highest salary in the first quartile of the 80 salaries. If the company were to hire 8 new employees at salaries that are less than the lowest of the 80 salaries, what would Mark's salary be with respect to the quartiles of the 88 salaries at the company, assuming no other changes in the salaries?

- A. The fourth-highest salary in the first quartile
- B. The highest salary in the first quartile
- C. The second-lowest salary in the second quartile
- D. The third-lowest salary in the second quartile
- E. The fifth-lowest salary in the second quartile

8. What is the least positive integer that is not a factor of $25!$ and is not a prime number?

- A. 26
- B. 28
- C. 36
- D. 56
- E. 58

9. P, Q, and R are three points in a plane, and R does not lie on line PQ. Which of the following is true about the set of all points in the plane that are the same distance from all three points?

- A. It contains no points.
- B. It contains one point.
- C. It contains two points.
- D. It is a line.
- E. It is a circle.

10. A student made a conjecture that for any integer n , the integer $4n + 3$ is a prime number. Which of the following values of n could be used to disprove the student's conjecture?

Indicate all such values.

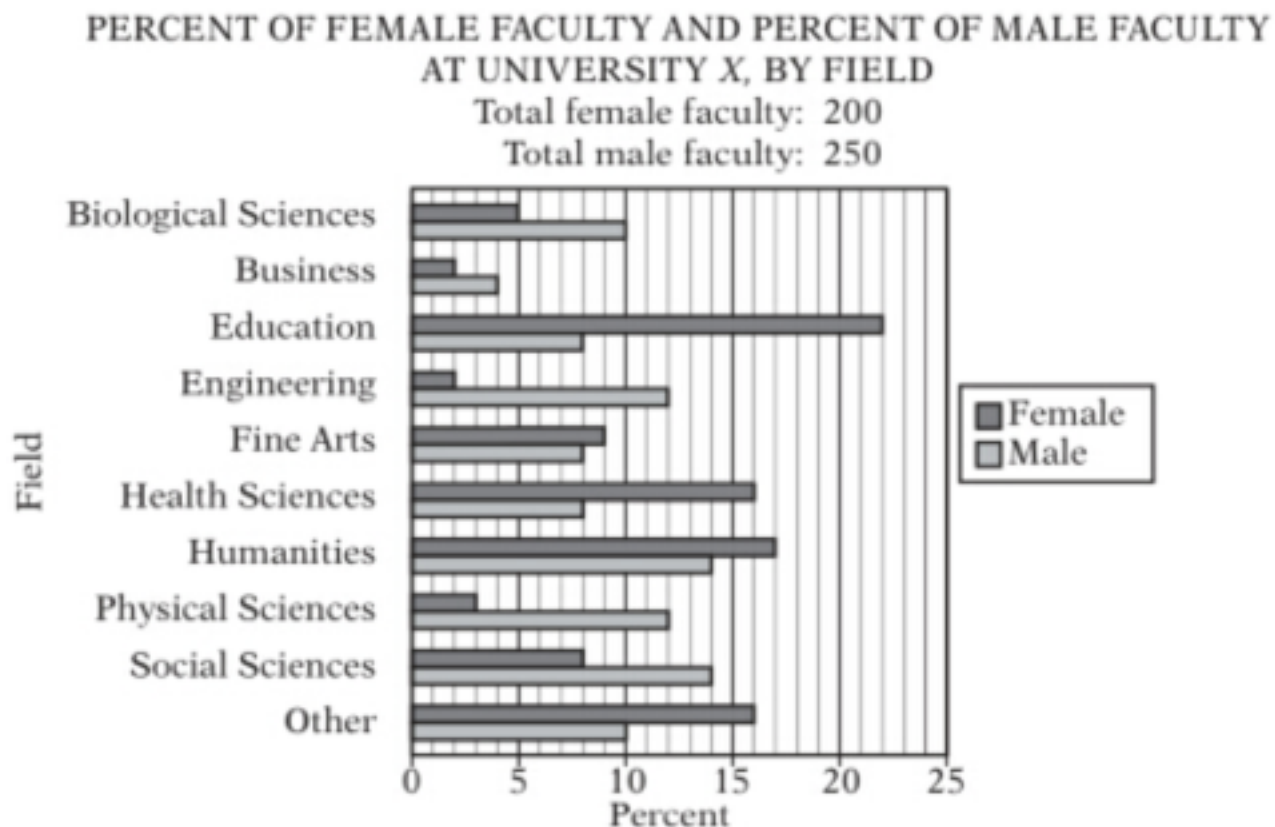
- A. 1
- B. 3
- C. 4
- D. 6
- E. 7

11. By weight, liquid A makes up 8 percent of solution R and 18 percent of solution S. If 3 grams of solution R are mixed with 7 grams of solution S, then liquid A accounts for what percent of the weight of the resulting solution?

- A. 10%
- B. 13%
- C. 15%
- D. 19%
- E. 26%

12. Approximately what percent of the faculty in humanities are male?

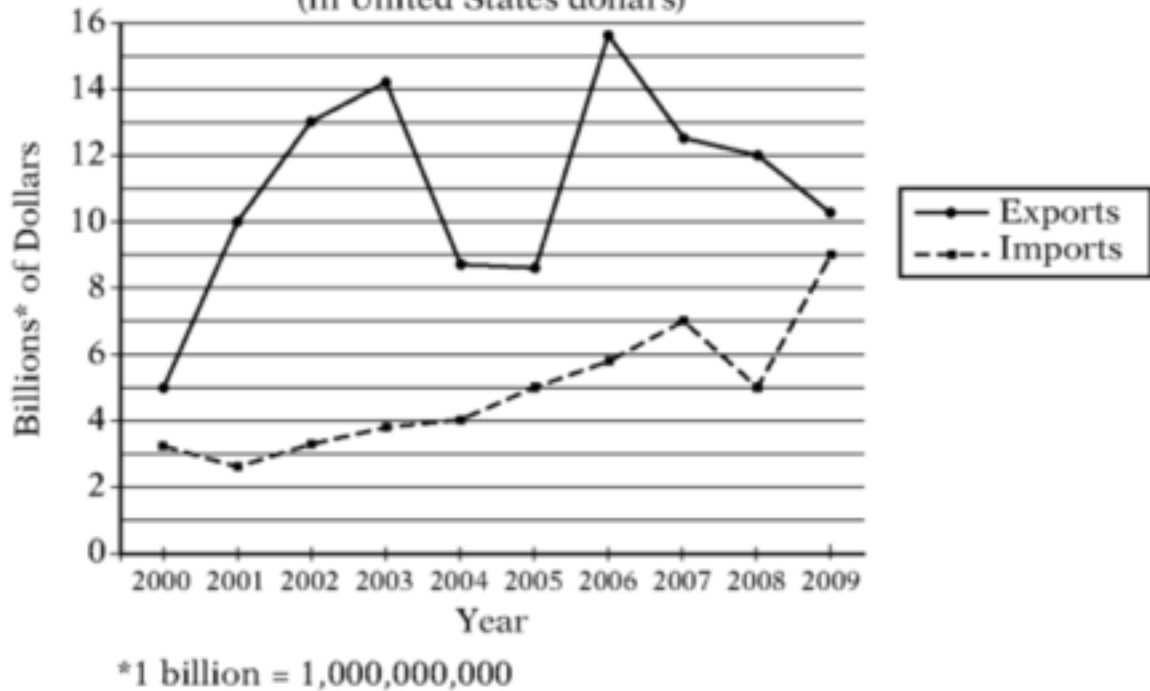
- A. 35%
- B. 38%
- C. 41%
- D. 45%
- E. 51%



13. Which of the following is closest to the average (arithmetic mean) of the 9 changes in the value of imports between consecutive years from 2000 to 2009 ?

- A. \$260 million
- B. \$320 million
- C. \$400 million
- D. \$480 million
- E. \$640 million

VALUE OF IMPORTS TO AND EXPORTS FROM COUNTRY T, 2000–2009
(in United States dollars)



14. A random variable Y is normally distributed with a mean of 200 and a standard deviation of 10.

Quantity A: The probability of the event that the value of Y is greater than 220

Quantity B: $\frac{1}{6}$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

15. $\frac{(1-x)}{(x-1)} = \frac{1}{x}$

Quantity A: x

Quantity B: $-\frac{1}{2}$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

16. In a quality-control test, 50 boxes-each containing 30 machine parts-were examined for defective parts. The number of defective parts was recorded for each box, and the average (arithmetic mean) of the 50 recorded numbers of defective parts per box was 1.12. Only one error was made in recording the 50 numbers: "1" defective part in a certain box was incorrectly recorded as "10".

Quantity A: The actual average number of defective parts per box

Quantity B: 0.94

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

17. The random variable X is normally distributed. The values 650 and 850 are at the 60th and 90th percentiles of the distribution of X , respectively.

Quantity A: The value at the 75th percentile of the distribution of X

Quantity B: 750

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

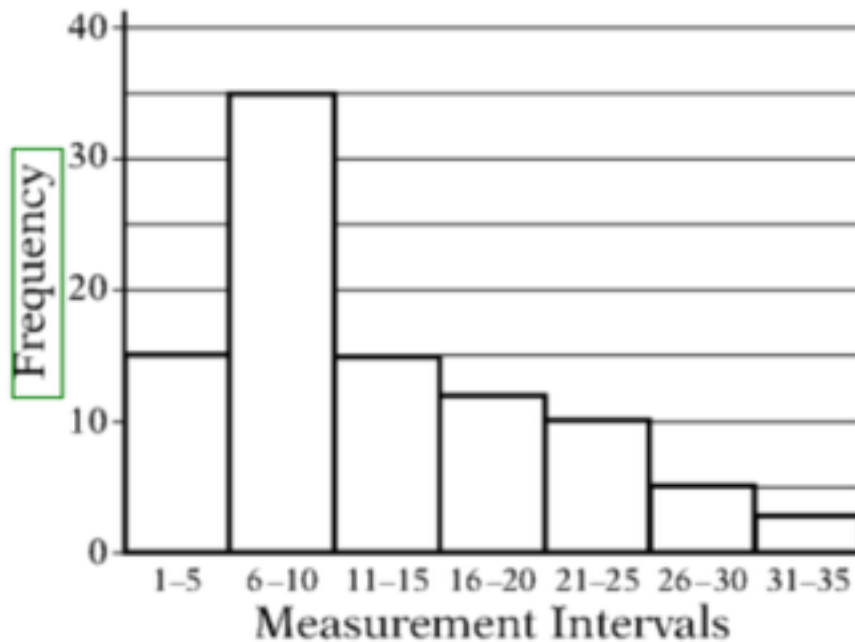
18. x is an integer greater than 1.

Quantity A: 3^{x+1}

Quantity B: 4^x

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

19. In the course of an experiment, 95 measurements were recorded, and all of the measurements were integers. The 95 measurements were then grouped into 7 measurement intervals. The graph above shows the frequency distribution of the 95 measurements by measurement interval.



Quantity A: The average (arithmetic mean) of the 95 measurements

Quantity B: The median of the 95 measurements

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

20. $xy > 0$, $xy^2 < 0$

Quantity A: x

Quantity B: y

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

21. r , s , and t are three consecutive odd integers such that $r < s < t$.

Quantity A: $r + s + 1$

Quantity B: $s + t - 1$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

22. n is a positive integer, $x = 7n + 2$, and $y = 6n + 3$

Quantity A: the ones digit of $x+y$

Quantity B: 5

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

23.

Quantity A: x^2+1

Quantity B: $2x-1$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

24. List K consists of the numbers -10, -5, 0, 5, and 10. Which of the following lists of numbers have the same range as the numbers in list K ?

Indicate all such lists.

- A. -15, -1, 0, 1, 15
- B. -7, -4, -2, 1, 13
- C. 0, 1, 2, 5, 8, 10
- D. 2, 3, 5, 15, 19, 22
- E. 4, 5, 6, 24

25. If $a < b < 0$, which of the following numbers must be positive?

Indicate all such numbers.

- A. $a-b$
- B. a^2-b^2
- C. ab
- D. a^2b
- E. a^2+ab^2

26. Eight points are equally spaced on a circle. If 4 of the 8 points are to be chosen at random, what is the probability that a quadrilateral having the 4 points chosen as vertices will be a square?

- A. $1/70$
- B. $1/35$
- C. $1/7$
- D. $1/4$
- E. $1/2$

27. The range of the heights of the female students in a certain class is 13.2 inches, and the range of the heights of the male students in the class is 15.4 inches.

Which of the following statements individually provide(s) sufficient additional information to determine the range of the heights of all the students in the class?

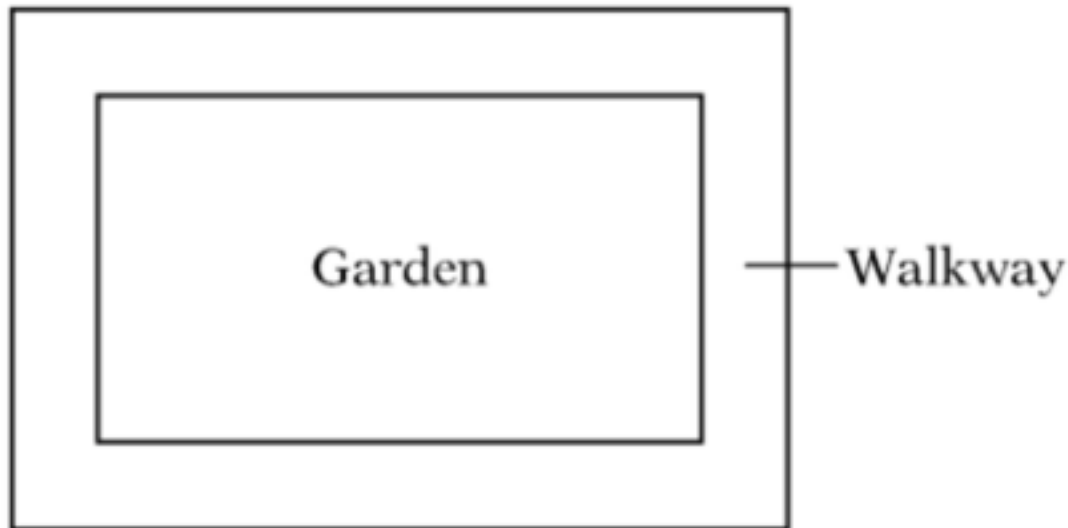
Indicate all such statements.

- A. The tallest male student in the class is 5.8 inches taller than the tallest female student in the class.
- B. The median height of the male students in the class is 1.1 inches greater than the median height of the female students in the class.
- C. The average (arithmetic mean) height of the male students in the class is 4.6 inches greater than the average height of the female students in the class.

28. Of the 20 lightbulbs in a box, 2 are defective. An inspector will select 2 lightbulbs simultaneously and at random from the box. What is the probability that neither of the lightbulbs selected will be defective?

Give your answer as a fraction.

29. The figure above represents a rectangular garden with a walkway around it. The garden is 18 feet long and 12 feet wide. The walkway is uniformly 3 feet wide, and its edges meet at right angles. What is the area of the walkway?



30. Line k lies in the xy -plane. The x -intercept of line k is -4 , and line k passes through the midpoint of the line segment whose endpoints are $(2, 9)$ and $(2, 0)$. What is the slope of line k ?

Give your answer as a fraction.

31. The table above shows the frequency distribution of the values of a variable Y . What is the mean of the distribution?

Give your answer to the nearest 0.01.

Y	Frequency
$\frac{1}{2}$	2
$\frac{3}{4}$	7
$\frac{5}{4}$	8
$\frac{3}{2}$	8
$\frac{7}{4}$	9

32. If $1/[(2^{11}) \cdot (5^{17})]$ is expressed as a terminating decimal, how many nonzero digits will the decimal have?

- A. One
- B. Two
- C. Four
- D. Six
- E. Eleven

33. Which of the following statements individually provide(s) sufficient additional information to determine the area of triangle ABC above?

Indicate all such statements.



The length of AB is $10\sqrt{3}$.

- A. DBC is an equilateral triangle.
- B. ABD is an isosceles triangle.
- C. The length of BC is equal to the length of AD .
- D. The length of BC is 10.
- E. The length of AD is 10.

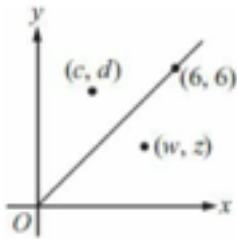
34. During an experiment, the pressure of a fixed mass of gas increased from 40 pounds per square inch (psi) to 50 psi. Throughout the experiment, the pressure, P psi, and the volume, V cubic inches, of the gas varied in such a way that the value of the product PV was constant.

Quantity A: the volume of the gas when the pressure was 40 psi

Quantity B: 1.2 times the volume of the gas when the pressure was 50 psi

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

35.



Quantity A: $w+d$

Quantity B: $c+z$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

36. In the xy -plane, one of the vertices of square S is the point $(2, 2)$. The diagonals of S intersect at the point $(6, 6)$.

Quantity A: the area of S

Quantity B: 64

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

37.

Quantity A: the number of two-digit positive integers for which the units digit is not equal to the tens digit

Quantity B: 80

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

38. In a probability experiment, G and H are independent events. The probability that G will occur is r , and the probability that H will occur is s , where both r and s are greater than 0.

Quantity A: the probability that either G will occur or H will occur, but not both

Quantity B: $r+s-rs$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

39. $S = \{1, 4, 7, 10\}$ $T = \{2, 3, 5, 8, 13\}$ x is a number in set S, and y is a number in set T.

Quantity A: The number of different possible values of the product xy

Quantity B: 20

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

40. $m=10^{32}+2$, when m is divided by 11, the remainder is r .

Quantity A: r

Quantity B: 3

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

41. List X: 2, 5, s, t List Y: 2, 5, t.

The average (arithmetic mean) of the numbers in list X is equal to the average of the numbers in list Y.

Quantity A: s

Quantity B: 0

A. Quantity A is greater.

B. Quantity B is greater.

C. The two quantities are equal.

D. The relationship cannot be determined from the information given.

42.

RESULTS OF A USED-CAR AUCTION

	<u>Small Cars</u>	<u>Large Cars</u>
Number of cars offered	32	23
Number of cars sold	16	20
Projected sales total for cars offered (in thousands)	\$70	\$150
Actual sales total (in thousands)	\$41	\$120

For the large cars sold at an auction that is summarized in the table above, what was the average sale price per car?

43. $N=824^x$, where x is a positive integer

Quantity A: the number of possible values the units digit of N

Quantity B: 4

A. Quantity A is greater.

B. Quantity B is greater.

C. The two quantities are equal.

D. The relationship cannot be determined from the information given.

44. r and t are consecutive integers and $p=r^2+t$.

Quantity A: $(-1)^p$

Quantity B: -1

A. Quantity A is greater.

B. Quantity B is greater.

C. The two quantities are equal.

D. The relationship cannot be determined from the information given.

45. 1, -3, 4, 1, -3, 4, 1, -3, 4, ..

In the sequence above, the first 3 terms repeat without end. What is the sum of the terms of the sequence from the 150th term to the 154th term?

46. A manufacturing company has plants in three locations: Indonesia, Mexico, and Pakistan. The company has 6,000 employees, and each of the employees works at only one of the plants. If $\frac{3}{8}$ of the employees work at the plant in Indonesia and if twice as many employees work at the plant in Mexico as work at the plant in Pakistan, how many employees work at the plant in Mexico?

47. In a single line of people waiting to purchase tickets for a movie, there are currently 10 people behind Shandra. If 3 of the people who are currently in line ahead of Shandra purchase tickets and leave the line, and no one else leaves the line, there will be 8 people ahead of Shandra in line. How many people are in the line currently?

48. When the decimal point of a certain positive decimal number is moved six places to the right, the resulting number is 9 times the reciprocal of the original number. What is the original number?

49. From 2011 to 2012, Jack's annual salary increased by 10 percent and Arnie's annual salary decreased by 5 percent. If their annual salaries were equal in 2012, then Arnie's annual salary in 2011 was what percent greater than Jack's annual salary in 2011 ?

Give your answer to the nearest 0.1 percent.

50. If $|z| \leq 1$, which of the following statements must be true?

Indicate all such statements.

- A. $z^2 \leq 1$
- B. $z^2 \leq z$
- C. $z^3 \leq z$

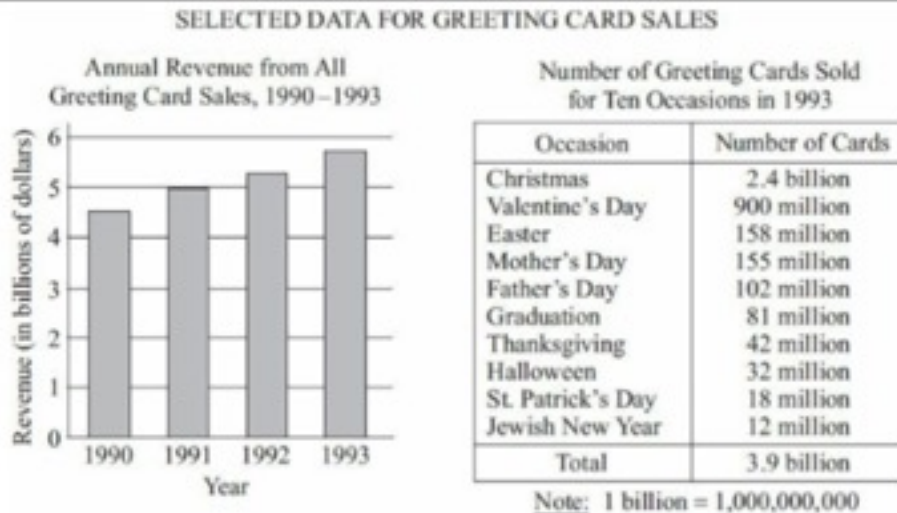
51. Each of the following linear equations defines y as a function of x for all integers x from 1 to 100. For which of the following equations is the standard deviation of the y -values corresponding to all the x -values the greatest?

- A. $y = x/3$
- B. $y = x/2 + 40$
- C. $y = x$
- D. $y = 2x + 50$
- E. $y = 3x - 20$

52. For a certain distribution, the measurement 12.1 is 1.5 standard deviations below the mean, and the measurement 17.5 is 3.0 standard deviations above the mean. What is the mean of the distribution?

- A. 13.8
- B. 13.9
- C. 14
- D. 14.1
- E. 14.2

53-56题看下图



53. In 1993 the average (arithmetic mean) price per card for all greeting cards sold was \$1.25. For which of the following occasions was the number of cards sold in 1993 less than the total number of cards sold that year for occasions other than the ten occasions shown?

Indicate all such occasions.

- A. Christmas
- B. Valentine's Day
- C. Easter
- D. Mother's Day
- E. Father's Day
- F. Graduation
- G. Thanksgiving
- H. Halloween

54. Approximately what was the percent increase in the annual revenue from all greeting card sales from 1990 to 1993?

- A. 50%
- B. 45%
- C. 39%
- D. 28%
- E. 20%

55. In 1993 the number of Valentine's Day cards sold was approximately how many times the number of Thanksgiving cards sold?

- A. 20
- B. 30
- C. 40
- D. 50
- E. 60

56. In 1993 a card company that sold 40 percent of the Mother's Day cards that year priced its cards for that occasion between \$1.00 and \$8.00 each. If the revenue from sales of the company's Mother's Day cards in 1993 was r million dollars, which of the following indicates all possible values of r ?

- A. $155 < r < 1,240$
- B. $93 < r < 496$
- C. $93 < r < 326$
- D. $62 < r < 744$
- E. $62 < r < 496$

57. Of the students in a school, 20 percent are in the science club and 30 percent are in the band. If 25 percent of the students in the school are in the band but are not in the science club, what percent of the students who are in the science club are not in the band?

- A. 5%
- B. 20%
- C. 25%
- D. 60%
- E. 75%

58. The greatest of the 21 positive integers in a certain list is 16. The median of the 21 integers is 10. What is the least possible average (arithmetic mean) of the 21 integers?

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

59. If j and k are even integers and $j < k$, which of the following equals the number of even integers that are greater than j and less than k ?

- A. $(k-j-2)/2$
- B. $(k-j-1)/2$
- C. $(k-j)/2$
- D. $k-j$
- E. $k-j-1$

60. Based on the information given, which of the following statements must be true?

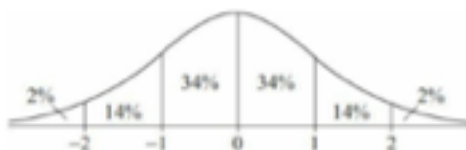
Indicate all such statements.

ANNUAL PERCENT CHANGE IN DOLLAR AMOUNT OF SALES
AT FIVE RETAIL STORES FROM 2006 TO 2008

Store	Percent Change from 2006 to 2007	Percent Change from 2007 to 2008
P	10	-10
Q	-20	9
R	5	12
S	-7	-15
T	17	-8

- A. For 2008 the dollar amount of sales at Store R was greater than that at each of the other four stores.
- B. The dollar amount of sales at Store S for 2008 was 22 percent less than that for 2006.
- C. The dollar amount of sales at Store R for 2008 was more than 17 percent greater than that for 2006

61. The figure above shows the standard normal distribution, with mean 0 and standard deviation 1, including approximate percents of the distribution corresponding to the six regions shown. The random variable Y is normally distributed with a mean of 470, and the value $Y = 340$ is at the 15th percentile of the distribution. Of the following, which is the best estimate of the standard deviation of the distribution?



- A. 125
- B. 135
- C. 145
- D. 155
- E. 165

62. In a certain medical group, Dr. Schwartz schedules appointments to begin 30 minutes apart, Dr. Ramirez schedules appointments to begin 25 minutes apart, and Dr. Wu schedules appointments to begin 50 minutes apart. All three doctors schedule their first appointments to begin at 8:00 in the morning, which are followed by their successive appointments throughout the day without breaks. Other than at 8:00 in the morning, at what times before 1:30 in the afternoon do all three doctors schedule their appointments to begin at the same time?

Indicate all such times

- A. 9:30 in the morning
- B. 10:30 in the morning
- C. 11:30 in the morning
- D. 12:00 noon
- E. 1:00 in the afternoon

63. In the xy -plane, triangular region R is bounded by the lines $x = 0$, $y = 0$, and $4x + 3y = 60$. Which of the following points lie inside region R ?

Indicate all such points

- A. (2, 18)
- B. (5, 12)
- C. (10, 7)
- D. (12, 3)
- E. (15, 2)

64. A flat, rectangular flower bed with an area of 2,400 square feet is bordered by a fence on three sides and by a walkway on the fourth side. If the entire length of the fence is 140 feet, which of the following could be the length, in feet, of one of the sides of the flower bed?

Indicate all such lengths

- A. 20
- B. 30
- C. 40
- D. 60
- E. 80

65. Set A has 50 members and set B has 53 members. At least 2 of the members in set A are not in set B . Which of the following could be the number of members in set B that are not in set A ?
Indicate all such numbers.

- A. 53
- B. 5
- C. 13
- D. 25
- E. 50

66. The distribution of the numbers of hours that students at a certain college studied for final exams has a mean of 12 hours and a standard deviation of 3 hours. Which of the following numbers of hours are within 2 standard deviations of the mean of the distribution?

Indicate all such numbers

- A. 2
- B. 5
- C. 10
- D. 14
- E. 16

67. In a certain sequence of numbers, each term after the first term is found by multiplying the preceding term by 2 and then subtracting 3 from the product. If the 4th term in the sequence is 19, which of the following numbers are in the sequence?

Indicate all such numbers.

- A. 5
- B. 8
- C. 11
- D. 16
- E. 35

68. For a certain probability experiment, the probability that event A will occur is $\frac{1}{2}$ and the probability that event B will occur is $\frac{1}{3}$. Which of the following values could be the probability that the event $A \cup B$ (that is, the event A or B, or both) will occur?

Indicate all such values.

- A. $\frac{1}{3}$
- B. $\frac{1}{2}$
- C. $\frac{3}{4}$

69. In a factory, machine A operates on a cycle of 20 hours of work followed by 4 hours of rest, and machine B operates on a cycle of 40 hours of work followed by 8 hours of rest. Last week, the two machines began their respective cycles at 12 noon on Monday and continued until 12 noon on the following Saturday. On which days during that time period was there a time when both machines were at rest?

Indicate all such days.

- A. Monday
- B. Tuesday
- C. Wednesday
- D. Thursday
- E. Friday

70.

Quantity A: The number of primes that are divisible by 9

Quantity B: The number of primes that are divisible by 19

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

71. n is an even integer.

Quantity A: The number of prime factors of n

Quantity B: The number of prime factors of $n/2$

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

72. In the xy -plane, line k has slope 2 and passes through the point $(3, r)$.

Quantity A

r

Quantity B

3

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

73.

Quantity A: The number of 3-digit integers all of whose digits are even

Quantity B: The number of 3-digit integers all of whose digits are odd

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

74. a and b are primes. $a+b=12$

Quantity A: b

Quantity B: 8

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

75. A and B are independent events, and the probability that both events occur is $1/2$. Which of the following could be the probability that event A occurs?

Indicate all such probabilities.

- A. 0
- B. $1/4$
- C. $1/2$
- D. $3/4$
- E. 1

76. If a , b , x , and y are positive integers, and $13^a \times 13^b = (13^x)^y = 13^{13}$, what is the average (arithmetic mean) of a , b , x , and y ?

77. A rectangle is drawn in a standard xy -coordinate plane. If the sides of the rectangle are not parallel to the axes, what is the product of the slope of the four sides?

- A. -1
- B. 0
- C. 1
- D. 2
- E. It cannot be determined from the information given.

78. In a certain state, each license plate consists of either three digits (between 0 and 9, inclusive) followed by two letters or three letters followed by two digits. For example, 055-XY, 123-PP, and AAA-70 are all acceptable plates. How many different license plates can the state issue?

79. A positive integer is a palindrome if it reads exactly the same from right to left as it does from left to right. For example, 5 and 66 and 373 are all palindromes. How many palindromes are there between 1 and 1,000, inclusive?

80. Line l passes through points in both quadrants II and III. Which of the following statements are true?

Indicate all such statements.

- A. Line l cannot pass through the origin.
- B. Line l cannot pass through any point in quadrant I.
- C. Line l cannot pass through any point in quadrant IV.
- D. The slope of line l cannot be 0.
- E. The slope of line l cannot be positive.
- F. The slope of line l cannot be negative.

81. Consider the following list of numbers that represent the number of text messages that Geraldine received on 10 consecutive days: 10, 9, 1, 3, 7, 7, 8, 3, 4, 3. Which of the following statements concerning this set of data are true?

Indicate all such lengths.

- A. The median is less than the average (arithmetic mean).
- B. The median is less than the mode.
- C. The mode is less than the average.
- D. The average of the median and the mode is between 4 and 4.5.

82. If c and d are odd positive integers, which of the following could be odd?

Indicate all such expressions.

- A. c^d
- B. c^{d+1}
- C. $(c+1)^{d+1}$
- D. $(c+d)^{c+d}$
- E. c^d/d^c

83. Last year Leo bought two paintings. This year he sold them for \$2,000 each. On one, he made a 25% profit, and on the other he had a 25% loss. What was his net loss or profit?

- A. He broke even.
- B. He lost less than \$100.
- C. He lost more than \$100.
- D. He earned less than \$100.
- E. He earned more than \$100.

84. The system of equations has how many solutions?

$$3x - 6y = 9$$

$$2y - x - 3 = 0$$

- A. None
- B. Exactly 1
- C. Exactly 2
- D. Exactly 3
- E. Infinitely many

85. If A is the initial amount put into an account, R is the annual percentage of interest written as a decimal, and the interest compounds annually, then which of the following would be an expression, in terms of A and R , for the interest accrued in three years?

- A. $A(R)^3$
- B. $A(R+R^3)$
- C. $A(3R+3R^2+R^3)$
- D. $3A(R)^3$
- E. $3A(R+R^2+R^3)$

86. What is the sum of all possible solutions of the equation $|x+4|^2 - 10|x+4| + 24 = 0$?

- A. -16
- B. -14
- C. -12
- D. -8
- E. -6

87. What is the sum of all possible solutions to the equation below?

$$\sqrt{2x^2 - x - 9} = x + 1$$

- A. -2
- B. 2
- C. 3
- D. 5
- E. 6

88. If $x + |x| + y = 7$ and $x + |y| - y = 6$, then $x + y =$

- A. -1
- B. 1
- C. 3
- D. 5
- E. 13

89. If $6 \cdot |4 - k/3| > 12$, which of the following could be the value of k ?

- A. -15
- B. -10
- C. -5
- D. 0
- E. 5
- F. 10
- G. 15
- H. 20

90. If $x + y \neq 0$, which of the following is a solution to the inequality below?

$$\frac{x^2 - y^2 - 1}{x + y} > \frac{-1}{x + y}$$

- A. $x=3$ and $y=7$
- B. $x=-3$ and $y=7$
- C. $x=-11$ and $y=-9$
- D. $x=9$ and $y=-6$
- E. $x=-20$ and $y=-24$
- F. $x=12$ and $y=9$
- G. $x=-2$ and $y=16$

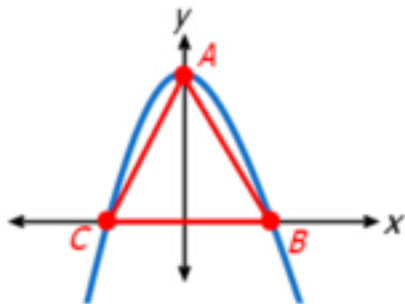
91. What is the y-intercept of the graph of the equation $y=2\cdot|4x-4|-10$?

92. How many points (x, y) lie on the line segment between $(22, 38/3)$ and $(7, 53/3)$ such that x and y are both integers?

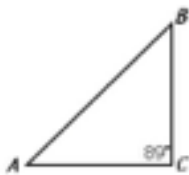
- A. 4
- B. 5
- C. 7
- D. 8
- E. 9

93. The figure shows the graph of the equation $y=k-x^2$, where k is a constant. If the area of triangle ABC is $1/8$, what is the value of k ?

Give your answer to the nearest 0.01.



94.

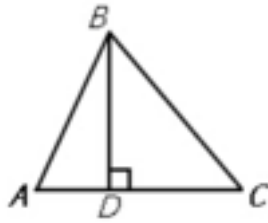


Quantity A: Length of AB

Quantity B: Length of BC

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

95.

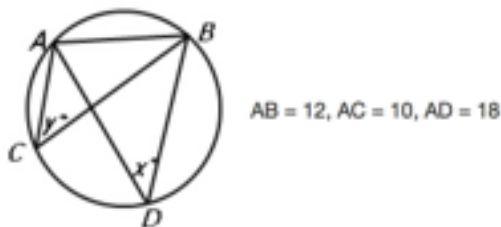


Quantity A: BD/AB

Quantity B: BC/DC

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

96.



Note: the region above is circular

Quantity A: x

Quantity B: y

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

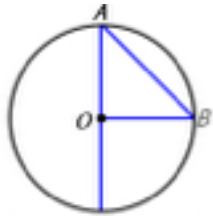
97.

Quantity A: Area of a rectangle with perimeter 20

Quantity B: Area of a triangle with base 5 and height 10.

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

98.



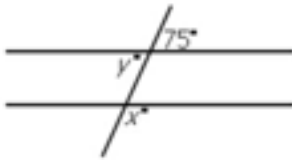
O is the center of the circle.

Quantity A: Length of AO

Quantity B: Length of AB

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

99.

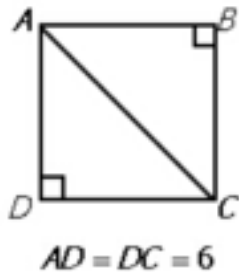


Quantity A: x

Quantity B: y

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

100.



Quantity A: AB

Quantity B: BC

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

101. If $x > 0$, and two sides of a certain triangle have lengths $2x+1$ and $3x+4$ respectively, which of the following could be the length of the third side of the triangle?

Indicate all possible lengths.

- A. $4x+5$
- B. $x+2$
- C. $6x+1$
- D. $5x+6$
- E. $2x+17$

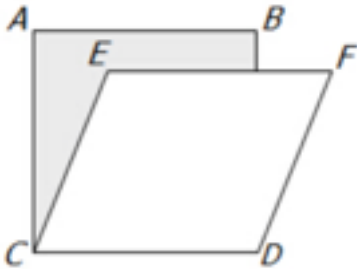
102. If the length of each side of an equilateral triangle were increased by 50 percent, what would be the percent increase in the area?

- A. 75%
- B. 100%
- C. 125%
- D. 150%
- E. 225%

103. Two sides of a triangle have length 6 and 8. Which of the following are possible areas of the triangle?

- I. 2
 - II. 12
 - III. 24
- A. I only
B. I and II only
C. II and III only
D. I and III only
E. I, II, and III

104.



If ABCD is a square with area 625, and CEFD is a rhombus with area 500, then the area of the shaded region is

Note: Figure not drawn to scale

- A. 125
B. 175
C. 200
D. 250
E. 275

105. If \$5,000,000 is the initial amount placed in an account that collects 7% annual interest, which of the following compounding rates would produce the largest total amount after two years?

- A. compounding annually
B. compounding quarterly
C. compounding monthly
D. compounding daily
E. All four of these would produce the same total

106. Tuk weighs 60 percent more than Kim, Lee weighs 50 percent less than Tuk, and Pat weighs 25 percent more than Lee. If Pat weighs 126 pounds, what is Kim's weight?

107. If $x > 0$, which of the following expressions are equal to 3.6 percent of $5x/12$?

Indicate all such expressions.

- A. 3 percent of $20x$
- B. x percent of $3/2$
- C. $3x$ percent of 0.2
- D. 0.05 percent of $3x$
- E. $3x/200$

108.

Quantity A: 0.05 percent of 4000

Quantity B: $1/200$ of 4000

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

109.

Quantity A: 22 percent of x

Quantity B: $2/9$ of x

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

110. Anne pays 150 percent more for a wholesale widget than Bart pays. Anne's retail price per widget is 15 percent greater than the wholesale price she paid. Bart's retail price per widget is 185 percent greater than the wholesale price he paid.

Quantity A: Anne's retail price

Quantity B: Bart's retail price

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

111. Diana invested \$61,293 in an account with a fixed annual percent of interest, compounding quarterly. At the end of five full years, she had \$76,662.25 in principal plus interest. Approximately what was the annual percent rate of interest for this account?

- A. 1.2%
- B. 4.5%
- C. 10%
- D. 18%
- E. 25.2%

112. Events A and B are independent.

The probability that events A and B both occur is 0.6

Quantity A: The probability that event A occurs

Quantity B: 0.3

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

113. A box contains 10 balls numbered from 1 to 10 inclusive. If Ann removes a ball at random and replaces it, and then Jane removes a ball at random, what is the probability that both women removed the same ball?

- A. $1/100$
- B. $1/90$
- C. $1/45$
- D. $1/10$
- E. $41/45$

114. A: {71,73,79,83,87} B: {57,59,61,67}

If one number is selected at random from set A, and one number is selected at random from set B, what is the probability that both numbers are prime?

- A. $9/20$
- B. $3/5$
- C. $3/4$
- D. $4/5$
- E. 1

115. If points A and B are randomly placed on the circumference of a circle with radius 2, what is the probability that the length of chord AB is greater than 2?

- A. $\frac{1}{4}$
- B. $\frac{1}{3}$
- C. $\frac{1}{2}$
- D. $\frac{2}{3}$
- E. $\frac{3}{4}$

116. If k is the greatest positive integer such that 3^k is a divisor of $15!$ then $k =$

- A. 3
- B. 4
- C. 5
- D. 6
- E. 7

117. In a certain sock drawer, there are 4 pairs of black socks, 3 pairs of gray socks and 2 pairs of orange socks. If socks are removed at random without replacement, what is the minimum number of socks that must be removed in order to ensure that two socks of the same color have been removed?

- A. 4
- B. 7
- C. 9
- D. 10
- E. 11

118. Sid intended to type a seven-digit number, but the two "3" he meant to type did not appear. What appeared instead was the five-digit number 52115. How many different seven-digit numbers could Sid have meant to type?

- A. 10
- B. 16
- C. 21
- D. 24
- E. 27

119. In how many different ways can 3 boys and 3 girls be seated in a row of 6 chairs such that the girls are not separated, and the boys are not separated?

- A. 24
- B. 36
- C. 72
- D. 144
- E. 288

120. N equals the number of positive 3-digit numbers that contain odd digits only.

Quantity A: N

Quantity B: 125

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

121. From a group of 8 people, it is possible to create exactly 56 different k-person committees. Which of the following could be the value of k ?

Indicate all such values.

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5
- F. 6
- G. 7

122. A knockoff website requires users to create a password using letters from the word MAGOSH. If each password must have at least 4 letters and no repeated letters are allowed, how many different passwords are possible?

123. In how many different ways can 3 identical green shirts and 3 identical red shirts be distributed among 6 children such that each child receives a shirt?

- A. 20
- B. 40
- C. 216
- D. 720
- E. 729

124. How many integers between 1 and 10^{21} are such that the sum of their digits is 2?

- A. 190
- B. 210
- C. 211
- D. 230
- E. 231

125. There are 10 people in a room. If each person shakes hands with exactly 3 other people, what is the total number of handshakes?

- A. 15
- B. 30
- C. 45
- D. 60
- E. 120

126. How many positive integers less than 10,000 are such that the product of their digits is 210?

- A. 24
- B. 30
- C. 48
- D. 54
- E. 72

127. In a group of 45 children, 60 percent of the children are boys, and 60 percent of the children are left-handed.

Quantity A: Number of boys who are left-handed

Quantity B: 8

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

128. In a group of 200 workers, 10 percent of the males smoke, and 49 percent of the females smoke.

Quantity A: Total number of workers who smoke

Quantity B: 59

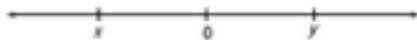
- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

129. A-town and B-ville are connected by a straight, 420-mile road. At noon, Atu left A-town for B-ville, and Brek left B-ville for A-town. If Atu travels at 56 miles per hour and Brek travels at 49 miles per hour, how many miles apart will Atu and Brek be 1 hour before they meet?

130. At a certain university, 60% of the professors are women, and 70% of the professors are tenured. If 90% of the professors are women, tenured, or both, then what percent of the men are tenured?

- A. 25
- B. 37.5
- C. 50
- D. 62.5
- E. 75

131.



Note: Figure not drawn to scale

If x and y are numbers on the number line above, which of the following statements must be true?

- I. $|x+y| < y$
- II. $x + y < 0$
- III. $xy < 0$

- A. I only
- B. III only
- C. I and II
- D. I and III
- E. II and III

132.

Quantity A: The number of prime numbers divisible by 13

Quantity B: The number of prime numbers divisible by 2

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

133.

Quantity A: Number of primes between 50 and 60

Quantity B: Number of primes between 80 and 90

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

134. x and y are prime numbers and $x+y=18$

Quantity A: xy

Quantity B: 70

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

135. x is a positive integer. k is the remainder when x^3-x is divided by 3.

Quantity A: k

Quantity B: 1

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

136. x and y are integers greater than 5. x is y percent of x^2 .

Quantity A: x

Quantity B: 10

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

137. x is a positive integer. When x is divided by 2, 4, 6 or 8, the remainder is 1.

Quantity A: x

Quantity B: 24

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

138. 16,000 has how many positive divisors?

139. If x and y are integers, and $w = (x^2)y + x + 3y$, which of the following statements must be true?

Indicate all such statements.

- A. If w is even, then x must be even.
- B. If x is odd, then w must be odd.
- C. If y is odd, then w must be odd.
- D. If w is odd, then y must be odd.

140. If x and y are positive integers, and 1 is the greatest common divisor of x and y , what is the greatest common divisor of $2x$ and $3y$?

- A. Cannot be determined
- B. 1
- C. 2
- D. 5
- E. 6

141. If $n = 2 \times 3 \times 5 \times 7 \times 11 \times 13 \times 17$, then which of the following statements must be true?

- I. n^2 is divisible by 600
- II. $n + 19$ is divisible by 19
- III. $(n + 4)/2$ is even

- A. I only
- B. II only
- C. III only
- D. I and III
- E. None of the above

142. In the game of Dubblefud, red chips, blue chips and green chips are each worth 2, 4 and 5 points respectively. In a certain selection of chips, the product of the point values of the chips is 16,000. If the number of blue chips in this selection equals the number of green chips, how many red chips are in the selection?

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

143. If x is an odd negative integer and y is an even integer, which of the following statements must be true?

- I. $(3x - 2y)$ is odd
- II. xy^2 is an even negative integer
- III. $(y^2 - x)$ is an odd negative integer

- A. I only
- B. II only
- C. I and II
- D. I and III
- E. II and III

144. How many integers from 1 to 900 inclusive have exactly 3 positive divisors?

- A. 10
- B. 14
- C. 15
- D. 29
- E. 30

145. How many positive integers less than 100 have a remainder of 2 when divided by 13?

- A. 6
- B. 7
- C. 8
- D. 9
- E. 10

146. Which of the following are equal to $(1/560)^{-4}$?

Indicate all correct answers.

- A. $(560^5 - 560^4)/559$
- B. $560^{-8}/560^2$
- C. $70^4 \cdot (1/8)^{-4}$
- D. $(560^{16})^{0.5}$

147. S is a set of n consecutive integers.

Quantity A: The mean of S

Quantity B: The median of S

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

148. When the even integer n is divided by 7, the remainder is 3.

Quantity A: The remainder when n is divided by 14.

Quantity B: 10

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

149. The 20 people at a party are divided into n mutually exclusive groups in such a way that the number of people in any group does not exceed the number in any other group by more than 1.

Quantity A: The value of n if at least one of the groups consists of 3 people

Quantity B: 6

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

150. If n is a positive integer, then n^+ denotes a number such that $n < n^+ < n + 1$.

Quantity A: $20^+/4^+$

Quantity B: 5^+

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

151. At a sale, the cost of each tie was reduced by 20 percent and the cost of each belt was reduced by 30 percent.

Quantity A: The percent reduction on the total cost of 1 tie and 2 belts

Quantity B: 25%

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

152. If n is any prime number greater than 2, which of the following CANNOT be a prime number ?

- A. $n-4$
- B. $n-3$
- C. $n-1$
- D. $n+2$
- E. $n+5$

153. The "reflection" of a positive integer is obtained by reversing its digits. For example, 321 is the reflection of 123. The difference between a five-digit integer and its reflection must be divisible by which of the following?

- A. 2
- B. 4
- C. 5
- D. 6
- E. 9

154. If 55 percent of a group of people have brown hair and 80 percent of the same group do not have red hair, what fraction of those who do not have brown hair have red hair?

- A. $\frac{1}{4}$
- B. $\frac{4}{11}$
- C. $\frac{4}{9}$
- D. $\frac{5}{9}$
- E. $\frac{4}{5}$

155. A certain money market account that had a balance of \$48,000 during all of last month earned \$360 in interest for the month. At what simple annual interest rate did the account earn interest last month?

- A. 7%
- B. 7.50%
- C. 8%
- D. 8.50%
- E. 9%

156. If N is an integer and $99 < N^2 < 200$, then N could have at most how many values?

- A. Two
- B. Four
- C. Six
- D. Eight
- E. Ten

157. If one number is chosen at random from the first 1,000 positive integers, what is the probability that the number chosen is a multiple of both 2 and 8?

- A. $\frac{1}{125}$
- B. $\frac{1}{8}$
- C. $\frac{1}{2}$
- D. $\frac{9}{16}$
- E. $\frac{5}{8}$

158. To obtain an FHA mortgage for \$50,000 or more, the home buyer must have a down payment equal to 4 percent of the first \$25,000 of the mortgage amount and 5 percent of the portion in excess of \$25,000. At settlement the buyers pays a mortgage-insurance premium equal to 3 percent of the mortgage amount. What is the maximum FHA mortgage, if any, a buyer can obtain if the buyer has only \$6,000 available for the down payment and insurance premium?

- A. \$62,500
- B. \$71,875
- C. \$78,125
- D. \$125,000
- E. The home buyer cannot obtain an FHA mortgage.

159. A certain holiday is always on the fourth Tuesday of Month X. If Month X has 30 days, on how many different dates of Month X can the holiday fall?

- A. Four
- B. Five
- C. Six
- D. Seven
- E. Eight

160. How many positive integers can be expressed as a product of two or more of the prime numbers 5, 7, 11, and 13 if no one product is to include the same prime factor more than once?

- A. Eight
- B. Nine
- C. Ten
- D. Eleven
- E. Twelve

161. The decorating committee for a dance plans to fringe the 3-inch-wide end of a streamer by making small cuts every $\frac{1}{16}$ inch. How many cuts must be made to fringe the end?

- A. 45
- B. 46
- C. 47
- D. 48
- E. 49

162. What is the remainder when 3^{283} is divided by 5?

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

163. If n is a positive odd integer and $k=n^3+2n$, what is the value of $(-1)^k - (-1)^{k+1}$?

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

164. If n and m are positive integers and m is a factor of 2^6 , what is the greatest possible number of integers that can be equal to both $3n$ and $2^6/m$?

- A. Zero
- B. One
- C. Three
- D. Four
- E. Six

165. In a data set of 10,000 numbers varying from 20 to 80, the number 62 is the 60th percentile and the number 74 is the n^{th} percentile.

Quantity A
 n

Quantity B
70

- A. Quantity A is greater.
- B. Quantity B is greater.
- C. The two quantities are equal.
- D. The relationship cannot be determined from the information given.

166. If 2, 4, 6, 9 are the digits of two 2-digit integers, what is the least possible positive difference between the integers?

- A. 28
- B. 27
- C. 17
- D. 13
- E. 9

167. A box at a yard sale contains 3 different china dinner set, each consisting of 5 plates. A customer will randomly select 2 plates to check for defects. What is the probability that the 2 plates selected will be from the same dinner set?

- A. $2/7$
- B. $2/5$
- C. $2/3$
- D. $5/6$
- E. $3/2$

168. Mike, Scott, Jim, Kate and Pete each have a different number of assignments this month. Pete has fewer assignments than Kate, Kate has more assignments than Mike, Mike has more assignments than Jim, and Jim has more assignments than Scott. Which of the following could be the person who has the median number of assignments this month for the five people listed?

Indicate all such answers.

- A. Mike
- B. Scott
- C. Jim
- D. Kate
- E. Pete

169. If the product of 7 consecutive integers is equal to the median of the integers, what is the least of the 7 integers?

170. 所有的GRE数学单词都背好了吗?

参考答案和解析

1. 答案：C

解析：Set the book price before tax is X . Then Mary paid $1.04X$.

She paid 10 dollars, and the change she got back is less than 3 dollars, so we have

$10 - 1.04X < 3$, we can get $X > 6.73$, and $X < 10$, so the sales tax should be more than 0.2692 but less than 0.4.

To test each of the options, notice you need to pick the option MUST be true.

A. WRONG. X needs to be bigger than 6.73 but doesn't have to be less than 9.50. For instance if the price is 9.51, all the conditions are still valid.

B. WRONG. X could be a value between 6.73 and 6.90.

C. CORRECT. If the sales tax is more than 0.45, the total price Mary needs to pay would be more than 10 dollars.

$$0.45 / 0.04 = 11.25 > 10$$

2. 答案：AC

解析：因为 n^2 是24与108的公倍数，两者的公倍数最小为216，然而他不是 n^2 的结果。所以要找216的倍数，且一个可以开方的数。找到是1296—六倍的216，这个数的开方数为36。所以36的所在集合S中的因子有12与36，因为其他的公倍数都是基于216这个数的，而且都可被12与36整除，所以满足36的因子就是最基本的因子，所以选AC。

3. 答案：121

解析：大部分人会用 $142+121-236=27$ 。可是这是least possible number。因为题目没说，236个学生只限定修algebra和chemistry所以可能有其他可能可以修，所以今天两个交集的最大数（问的是greatest possible number)就是142和121取最小那个数，就是那121个修chemistry同时也修了algebra。所以最大数应该是121。

4. 答案：11/17

解析：第二组有400人，所以有第二组有sneezing and itchy eyes的人数是 $400 \times 11\% = 44$ 人，第一组有300人，所以第一组有sneezing and itchy eyes的人数是 $300 \times 8\% = 24$ 人，所以一共68人，第二组有sneezing and itchy eyes的是44人，所以正确答案是 $44/68 = 11/17$ （GRE数学可以不约分）。

5. 答案：24/87

解析：female为黑条，total 200人，male为白条，total为250人：biological sciences和health sciences的女性总人数为 $(5\% + 16\%) \times 200 = 42$ ，男性总人数为 $(10\% + 8\%) \times 250 = 45$ 人，故professors比例为 $(42 \times 1/3 + 45 \times 2/9) / (42 + 45) = 24/87$ 。

6. 答案：ABC

解析：A. 设线k在x轴上的坐标为 $(a, 0)$ ，在y轴上坐标为 $(0, b)$ 因为k不经过原点并且在x轴的截距是在y轴截距的两倍，可知线k在x轴的截距和在y轴的截距同为正或者同为负，所以k的斜率 $= b / (-a) < 0$ 。

B. 线k在x轴的截距和在y轴的截距的乘积大于零，说明线k在x轴的截距和在y轴的截距同为正或者同为负，可得出k的斜率是负的。

C. 由 $(a-r)(b-s) < 0$ 。可得出线k的斜率 $= (b-s) / (a-r) < 0$ （两个数字相乘小于0，那么两个数字相除也小于0）。

7. 答案：E

解析：四分位数定义：统计学中位数的一种，即把所有数值由小到大排列并分成四等份，处于三个分割点位置的数值就是四分位数。

min Q1 Q2 Q3 max
|-----| [-----|-----] -----|

全部员工有80人，把全部分成四等分 0~25%, 25~50%, 50~75%, 75~100%，每个等分有 $80/4 = 20$ 人，题目说 Mark's salary of \$43,700 is the second-highest salary in the first quartile of the 80 salaries，所以他在0~25%这个区间的第二高，所以他是倒数第19名！现在有新员工8名，所以总数变成88人，区间也变成 $88/4 = 22$ 人。而这八个人的薪水比之前最低的还低，所以可以把Mark名次往上加 $19+8 = 27$ 名（从倒数19到倒数27）。而他的区间落在哪里？就是用 $27-22 = 5$ 所以他已经进入到第二个区间，但是是倒数第五低的！所以答案选The fifth-lowest salary in the second quartile，也就是E选项。

8. 答案： E

解析：五个选项都是合数，所以只需要考虑第一个条件就好了。把各个答案里的数字全部分解掉，如果分解掉的数字都出现在1-25中并不重复，那就排除掉，因此 $A=2 \times 13$ ，排除； $B=2 \times 14$ ，排除； $C=3 \times 12$ ；排除； $D=2 \times 4 \times 7$ ；排除； $E=2 \times 29$ ，29不在1-25中所以符合题目要求。所以正确答案选E。

9. 答案： B

解析：两条相连线段的中线只有一个焦点，到P和Q两点相同的点必定PQ的垂直平分线上，到P和R两点相同的点也必定在PR的垂直平分线上，由于R不在PQ上，说明PQ的垂直平分线和PR的垂直平分线不平行，相交于一点，这一点到这PQR三点的距离相等，其实就是确定了一个圆心，不在一条直线上的三点确定一个圆。

10. 答案： BD

解析：这个题目的意思是带入求出 $4n+3$ 的值不是质数即可，当 $n=1$ 时， $4n+3=7$ 是质数，不选；当 $n=3$ 时， $4n+3=15$ 不是质数，选；当 $n=4$ 时， $4n+3=19$ 是质数，不选；当 $n=6$ 时， $4n+3=27$ 不是质数，选；当 $n=7$ 时， $4n+3=31$ 是质数，不选。因此正确答案选BD。

11. 答案： C

解析： $(3 \times 8\% + 7 \times 18\%) / (3+7) = 15\%$ ，A makes up B 意思是“B是由A组成的”，别看反了。

12. 答案： E

解析： $(0.14 \times 250) / (0.14 \times 250 + 0.17 \times 200) = 51\%$ 。

13. 答案： E

解析：9个changes求和实际上就是将09年的值9减去00年的值3.2，再除以9求出平均数0.64。

14. 答案： B

解析：根据正态分布的规则，一个标准差之间所占比例是68%，两个标准差之间所占的比例是96%，题目大于220的概率为 $(1-96\%) / 2 = 2\% < 1/6$ ，所以正确答案选B。

15. 答案： B

解析：交叉相乘，算出 $x = \pm 1$ ，但是因为分母有 $x-1$ ，所以 x 只能是 $-1 < -1/2$ ，所以正确答案选B。

16. 答案： C

解析：因为有一箱标记错了，把1写成了10，多出来9。由题意可知50箱里有缺欠的产品总数其实应该为 $50 \times 1.12 - 9 = 47$ ，缺欠产品实际的平均数 $= 47/50 = 0.94$ 。

17. 答案：B

解析：题目说是正态分布 所以先画一个小山丘，percentile就是按面积一百等分，50th是中间，60th和90th在50th右边，处于下降趋势，the value of 60th是650可以理解成横坐标是650，由正态分布特征可以知道60th到90th每增加1th横坐标变化越来越快，也就是说60th到75th增加的横坐标要小于75th到90th增加的横坐标，所以75th的时候要小于750。

18. 答案：D

解析：用数量A除以数量B，结果是 $3(3/4)^x$ ，当 $x=2$ 时，该代数式 $=27/16 > 1$ ，此时数量A大于数量B；当 x 接近正无穷时，该代数式无限接近 $0 < 1$ ，所以此时数量A小于数量B，所以正确答案选D。

19. 答案：A

解析：这个题要用到极限思维，当每一个间隔里面都取最小数字的时候，所有数量的算术平均数 $= (1 \times 15 + 6 \times 35 + 11 \times 15 + 16 \times 12 + 21 \times 10 + 26 \times 5 + 31 \times 2) / 95 \approx 10.35$ ，但是这些数据的中数是第48个，这个数字一定在6-10这个区间内，6-10的区间的最大值10都小于10.35，所以这里的算术平均数一定是大于中数的，正确答案选A。

20. 答案：D

解析：第二个式子可以推出 $x < 0$ ， y 只要不等于0就可以。找特殊值就可以得出结论，比如 $x=-2$ ， $y=2$ 或者-2都满足第一个式子，所以选D。

21. 答案：B

解析：由已知条件知道 r, s, t 是连续的奇数。Quantity B-Quantity A= $t-r-2$ ，因为 t 和 r 是隔了一个数的，所以 $t-r=4$ 所以Quantity B-Quantity A= $2 > 0$ 。所以数量B更大。

22. 答案：D

解析：题目问的是 $x+y$ 的个位数和5相比，哪个大？ $x+y=7n+2+6n+3=13n+5$ ，题目中只提供了 $n>0$ 且 n 为整数，所以 $13n+5$ 的个位数有可能是0~9中的任何一个，故无法判断 $13n+5$ 的个位数与5相比哪个大。注意：题目不是问 $(x+y)$ 与5相比谁大。

23. 答案：A

解析： x^2+1 和 $2x-1$ 作比较，第一步：两边同时减去 $2x$ ， x^2-2x-1 和-1作比较；第二步：左边是个完全平方公式 $(x-1)^2$ 和-1作比较，左边永远大于0，所以答案选A。

24. 答案：BDE

解析：range 是极差的意思。-10，-5，0，5，10.这一系列的数的极差为20。选项B，D，E的极差也为20。因此得出正确选项。

25. 答案：BC

解析： $a < b$ ，所以 $a-b$ 一定是负的； $a < b < 0$ ，所以 a 的绝对值大于 b 的绝对值，所以 a^2 大于 b^2 ，所以 a^2-b^2 是正的； ab 都小于0，所以 $ab > 0$ ，正数。 a^2 是正的， b 是负的，所以 a^2b 是负的； a^2 是正的， ab^2 是负的，但是它们的绝对值大小无法判断，所以 a^2+ab^2 正负无法判断。

26. 答案：B

解析：正方形只有2个，总共 C_4^8 种选法=70，所以答案是 $2/70=1/35$ 。

27. 答案：A

解析：A选项—假设女生最矮身高是x，则女生最高身高是 $x+13.2$ ，男生最高则根据题意得知是 $x+13.2+5.8=x+19$ ，又因为男生身高极差是15.4，所以男生最矮是 $x+3.6$ ，所以整体学生身高的极差是19。A选项正确。

B选项—中数无法决定最大值，所以B选项无法推出学生身高的极差。

C选项—算数平均数也无法决定最大值，所以C选项也无法推出学生身高的极差。

28. 答案：153/190

解析：要求连续两次取的灯泡都是无瑕疵的，所以第一次从20个灯泡中取有18种可能，第二次从剩下的19个灯泡中取有17种可能。所以答案是 $(18 \times 17) / (20 \times 19) = 153/190$ 。

29. 答案：216 square feet

解析：大矩形的长 $18+(2)(3)=24$ ，宽 $12+(2)(3)=18$ ，步道面积 $(24)(18)-(18)(12)=432-216=216$ 。

30. 答案：3/4

解析：line K过点 $(-4, 0)$ ， $(2, 9/2)$ ，第二个点为 $(2, 9)$ ， $(2, 0)$ 的中点。故 $-4k+b=0$ ； $2k+b=9/2$ ，联立方程可解 $k=3/4$ 。

31. 答案：1.29

解析： $(1/2 \times 2 + 3/4 \times 7 + 5/4 \times 8 + 3/2 \times 8 + 7/4 \times 9) / (2+7+8+8+9) = 44/34 \approx 1.29$ 。

32. 答案：B

解析： $1/[(2^{11}) \cdot 5^{(17)}]$ 等于 $10^{-11} \times (0.2)^6$ ，因为2的6次方等于64，所以选B。

33. 答案：AD

解析：A选项，DBC等边三角形，则角DBC为60度，角ABD为30度，也就是三角形ABD为等腰三角形，此时， $AD=BD=DC=BC=10$ ，可计算。

B选项，等腰三角形也有可能是 $AB=AD$ ，这样不可得。

C选项， $BC=AD$ ，仍无具体的值。

D选项，符合特殊三角形的数据，能算出三角形面积。

E选项， $AD=10$ 无法推出BC的长度，不可计算面积。

34. 答案：A

解析：题目的意思是：气体是同样的气体，只是比较在不同压强下的体积大小。

$P \cdot V$ 是定量（假设为单位1），压强越大，体积越小。公式应该用体积正比于质量/压强，假设40psi，就当作是1/40，A就是1/40，假如50psi，就当作是1/50，B是1.2倍，所以是1.2/50，所以答案是A。

35. 答案：A

解析：从图中能看出， $c < d$ ， $z < w$ ，所以 $w+d > c+z$ ，正确答案选A。

36. 答案：C

解析：点 $(2, 2)$ 和 $(6, 6)$ 确定了半条对角线，由此可知正方形边长为 $(6-2) \times 2=8$ ，故S的面积为64。

37. 答案：A

解析：两位数一共有90个，个位和十位相等的数有9个，所以数量A是 $90-9=81 >$ 数量B，所以正确答案选A。

38. 答案：B

解析：G事件与H事件互相独立，G事件概率为r，H事件概率为s，求两事件其中之一发生的概率。
只发生G事件： $r \times (1-s)$ ，只发生H事件： $s \times (1-r)$ ，相加可得 $r+s-2 \times r \times s$ ，因此选B。

39. 答案：B

解析：因为XY乘积的所有可能结果一共有 $4 \times 5 = 20$ 种，而且很明显其中 $4 \times 5 = 2 \times 10$ 这两组结果重复了，所以自然XY乘积不同的结果小于20种，得出答案选B。

40. 答案：C

解析： $10^{32} + 2 = 9999 \dots 999 + 3$ ，前面的9999...999除以11能除尽，所以余数一定是3。

41. 答案：D

解析：算平均数即可， $(2+5+s+t)/4 = (2+5+t)/3$ ，解得 $s=(t+7)/3$ 。

42. 答案：6000\$

解析：第三行是指计划售出\$150,000这么多大型车，然而问的是实际售出的大型车的平均价格，所以 $\$120/20 \times 1000 = 6000$ 。也就是第一行和第三行和第一列都是多于条件。

43. 答案：B

解析：左边是 $824x$ 次方后，个位数可能的取值的个数。4的次方，个位数4,6循环，所以可能取值只有两个，选B。

44. 答案：C

解析：假设r是奇数，那么t则为偶数。奇数的平方仍为奇数，所以 $p=r^2+t=奇+偶=奇$ ， $A=-1$ 的奇次幂 $=-1=B$ ；假设r是偶数，那么t则为奇数。偶数的平方仍为偶数，所以 $p=r^2+t=偶+奇=奇$ ， $A=-1$ 的奇次幂 $=-1=B$ 。所以答案就是C。

45. 答案：7

解析：题目说前三项无限循环，所以1, -3, 4 是一个循环150th正好是4然后以此类推，150th 到154th 的和为 $4+1+(-3)+4+1=7$ 。

46. 答案：2500 employees

解析： $3/8$ 的员工在印度尼西亚，在墨西哥和巴基斯坦的员工占 $5/8$ ，一共是 $6000 \times 5/8 = 3750$ 人，题目又说墨西哥的员工是巴基斯坦员工数量的两倍，所以墨西哥员工人数是2500人，巴基斯坦员工熟人是1250人。

47. 答案：22 people

解析：S后面有10人，题目说如果现在在她前面的人有3个离开的话她前面就有8人，说明现在她前面有11人，所以队伍的人数一共是 $11+10+1=22$ 人。

48. 答案：0.003

解析：如果一个数的小数点右移6位，那么结果将是这个数的倒数的9倍。 $1000000x = 9/x$ ，解得 $x=0.003$ 。

49. 答案：15.8%

解析： $1.1J = 0.95A$ 所以 $A = 1.1578J$ 那A比J多多少？ $A-J=1.1578J-J=0.1578=15.8\%$ 。

50. 答案：A

解析： $|z| \leq 1$ 两边同时平方，推出A选项是正确的。BC选项当 z 为负数的时候都不满足，可以排除。

51. 答案：E

解析：一个连续数列，所有数加上 a ，标准差不变，所有数乘以 a ，标准差乘以 a ，所以这题就是看系数，系数越大， y 的标准差就越大。

52. 答案：B

解析：开始给这道题目写下解答过这题目的意思是某一个平均数的1.5标准偏差下限是12.5，3标准偏差上限是17.5；设平均值为 x ，标准偏差为 s ， $x - 1.5s = 12.1$ ， $x + 3s = 17.5$ ，解得 $x = 13.9$ ，所以选B。

53. 答案：C D E F G H

解析：由图看出总的sale大约是5.75，题目给了all greeting cards平均的价格是1.25 用5.75除以1.25 得出4.6 这是总的number 再用 $4.6 - 3.9$ （右图）得出除了这十个occasions之外的number，得到0.7billion，也就是700million，看右图除了最上面两个其余都比700小。

54. 答案：D

解析：题中问的是percent increase，再看图表的标题：annual revenue，就说明纵坐标已经表示是annual了，应该93-90年的是 $5.8 - 4.5 = 1.3$ ，再要除以最初的90年4.5，结果是 $1.3 \div 4.5 = 28.89\%$ ，答案选D。

55. 答案：A

解析： $900 \div 42 = 21.42$ ，所以正确答案选A选项。

56. 答案：E

解析：有40%的Mother's Day cards那就是总共有 $155 (\text{million}) \times 0.4 = 62$ 。每张卡片最便宜卖1元，最贵卖8元，所以范围就是 $(1 \times 62) < r < (62 \times 8) = 62 < r < 496$ ，正确答案选E。

57. 答案：E

解析：percent of 后面的就是分母，所以分母就是WHO are in the science club，一共百分之二十，are not in the band 是分子，所以是在people who are in the science club 里面有15%的人不在band，所以就是15%除以20%，所以结果是75%，正确答案是E。

58. 答案：C

解析：它问平均值最小是多少，中数是10 又说这列数最大是16，那么前面十个数可以都是1，那么第12个到第20个最小都为10，只有这样才会有最小平均值6。

59. 答案：A

解析：注意题目中的问题是“the number of even integers”，即J、K之间的偶数。取差后需减去头尾，偶数占半数，除以2，选A。

60. 答案：C

解析：A选项因为没有告知各个商店的基数，所以仅从百分比无法看出数量大小，错误；B选项S商店因为06年到07年减少了7%，所以07年的基数变小了，所以尽管07年到08年减少了15%，但是因为07年基数小于06年，所以从06年到08年的减少百分比是小于22%的，所以B选项错；C选项和B选项道理接近，06年到07年R商店上涨是5%，所以07年的基数增加了，所以尽管07年到08年上涨12%，但是06年到08年上涨的百分比是大于17%的，所以C选项正确。

61. 答案：A

解析：如图所示，16%percentile 是在离mean 左边一个标准差的位置。15%percentile在16%percentile的左边。说明16%percentile的标准差小于15%percentile。

62. 答案：BE

解析：S是每30min有一次预约，R每25min，W每50min，中间没有停顿。题目问从早上8点到13:30之间，抛开早上8点那次，还有那几个时间点是这三个医生同时开始一个预约的。解答时先求出这三个时间的最小公倍数，也就是150min，说明没2.5个小时这三个医生会同时开始一项新的预约。则在给定的时间段内，10:30和13:00这两个时间他们会同时开始新的预约。

63. 答案：BD

解析：根据直线 $4x + 3y = 60$ 带值求，当 $x=2$ 时， $y=52/3 < 18$ ，所以A排除；当 $x=5$ 时， $y=40/3 > 12$ ，所以B正确；当 $x=10$ 时， $y=20/3 < 7$ ，所以C排除；当 $x=12$ 时， $y=4 > 3$ ，所以D正确；当 $x=15$ 时， $y=0 < 2$ ，所以E排除。

64. 答案：BCDE

解析：有两种可能，1、fence是长，则是2宽+1长=140feet，设宽为X，有 $X(140-2X)=2400$ 解出有30，40；2、fence是宽，则是1宽+2长=140feet，设宽为X，有 $X(140-X)/2=2400$ ，解出有 $x=60$ ，80。

65. 答案：ABCDE

解析：用韦恩图做，设x为在a，不在b。 $x \geq 2$ ，所以在a，在b为 $50-x$ ，在b不在a为 $53-50+x=3+x \geq 5$ 同时 $50-x > 0$ ，所以 $5 \leq x \leq 53$ 。

66. 答案：CDE

解析：根据题意可知所求结果的取值范围是 $6 \leq x \leq 18$ ($6=12-2 \times 3$ ， $18=12+2 \times 3$)。

67. 答案：ACE

解析： $2c-3=19$ ； $c=11$ ； $2b-3=11$ ； $b=7$ ； $2a-3=7$ ； $a=5$ ； $2 \times 19-3=d$ ，所以 $d=35$ 。

68. 答案：BC

解析：往简单了想 画图 概率总共为1，是一个长方形，其中包含两个事件，分别画两个圆A，B，其中A的面积为 $1/2$ ，B的是 $1/3$ ，题目求得也就是AB形成的图形的面积。题中没说AB是否为独立事件，所以往简单了想，AB这两个组成的面积最大则是两者不相交的时候，则概率为 $5/6$ ，面积最小则是B包含于A中，面积为 $1/2$ ，所以概率的范围为 $1/2 \sim 5/6$ 。

69. 答案：CE

解析：这题实质上考察的是最小公倍数，A机器是24小时一个轮回，B机器是48小时一个轮回，如果机器休息结束时刻相同，也就是24与48最小公倍数或者最小公倍数的倍数的时候，两台机器休息有相同时刻。48小时即最小公倍数，第一个48小时在周三，第二个48消失在周五。

70. 答案：B

解析：这道题的意思是，9和19分别做除数，然后数出有多少个被除数能够是质数，且满足除以9和19之后是整数的。所以A是0（因为能除以9还是整数的，最小就是9了，而9本身就不是质数，再之后 9×2 或 3 什么的，更不可能是质数了），而B是19（这个最小的数就是19~~是质数）。

71. 答案: D

解析: 当 n 是 4 的倍数时, 两者相同——因为 $n/2$ 也是偶数, 因此也包含 2 这个质因子 (除了 $n=0$ 的情况, 当然这种情况下两者质因子数目也相等——都是 0); 但如果 n 不是 4 的倍数则 $n/2$ 为奇数, 比 n 少了一个质因子 2。

72. 答案: D

解析: 只知道斜率是 2, 所以这条直线 k 可以上下滑动, 所以 r 的值不能确定, 正确答案选 D。

73. 答案: B

解析: 偶数有 0.2.4.6.8 奇数有 1.3.5.7.9, 但是组合成三位数的时候 0 不能放在句首, 所以 Quantity B > Quantity A。

74. 答案: B

解析: 因为 a 、 b 是质数, 且 $a+b=12$, 所以 b 只可能是 5 或 7, 都比 8 小。

75. 答案: CDE

解析: first, A and B are independent events, $P(A \text{ and } B) = P(A) \times P(B) = 1/2$, then both $p(A)$ and $P(B)$ can not be 0; for all possibilities, $0 < P(A)$ and $P(B) \leq 1$; then add the answer into the equation: $P(A) \times P(B) = 1/2$; Note that $0 < P(A)$ and $P(B) \leq 1$ 。

76. 答案: 6.75

解析: $a+b=13$, $xy=13$, 因为四个数都是整数所以, x 、 y 一个是 1, 一个是 13, 即 $x+y=14$, 平均数就是 $(13+14)/4=6.75$ 。

77. 答案: C

解析: 由 the rectangle are not parallel to the axes 推出 slope 的积不为 0, 另外, 两垂直直线斜率之积为 -1, 所以 slope 的积为 1。

78. 答案: 2433600

解析: $10 \times 10 \times 10 \times 26 \times 26 + 26 \times 26 \times 26 \times 10 \times 10 = 2433600$ 。

79. 答案: 108

解析: 1 位数 1-9, 9 个, 2 位数 11-99, 9 个, 3 位数, 101-909, $10 \times 9 = 90$ 个, 共 108 个。

80. 答案: AD

解析: 自己画个图更好理解, A 选项, 过二三象限的直线不可能过原点, A 正确; B 选项, 当直线斜率为正的时候, 直线会过第一象限, B 排除; C 选项, 当直线斜率为负的时候, 直线会过第四象限, C 排除; D 选项, 斜率为 0 的直线不可能穿过 X 轴, D 正确; E 选项, 和 B 选项同理, E 排除; F 选项, 同 C 选项同理, F 排除。

81. 答案: CD

解析: 1 3 3 3 4 7 7 8 9 10, median: 5.5, average: 5.5, mode: 3。

82. 答案: ABE

解析: 值得注意的是问题使用的动词时 could be, 即只要存在答案为奇数的结果, 就是正确选项。令 $c=b=1$, 可知 ABE 必然正确; CD 选项还需另外选取 3, 5 进行排除。

83. 答案：C

解析：赚25%那幅画的成本价是1600美金，亏25%那幅画的成本价2666.67美金，所以一幅画赚了400美金，另外一幅画亏了666.67美金，所以总体亏了266.67美金，所以答案选C。

84. 答案：A

解析：一式： $3x - 6y = 9$; $3(x-2y) = 9$; $x - 2y = 3$ ，二式： $2y - x - 3 = 0$; $x - 2y = -3$ ，是两条斜率相等的平行线，所以无解才对，应该选A。

85. 答案：C

解析： $A(1+R)^3 - A$ ，所以答案选C选项。

86. 答案：D

解析： $K = |x+4| \Rightarrow K^2 - 10K - 24 = 0$, $(K-12)(K+2) = 0$

1) $K=12 \rightarrow x+4 = 12$, $x+4 = -12$ ，所以 $x=8$ 或者 -16 ，所以加起来结果是 -8 。

2) $K = -2 \rightarrow$ NOT AVAILABLE。

87. 答案：D

解析：此式两边平方解出 x 等于5或 -2 ，带入原式 -2 不符，故解为5。由于根式的结果必须非负，即 x 大于等于 -1 ，则 $x=-2$ 不符合。所以正确答案选D。

88. 答案：C

解析：此题最好从第二个式子入手，假设 y 是正的，那么 $|y|=y$ ，所以 $x=6$ ，再代入第一个式子，有 $12+y=7$ ， $y=-5$ ，与假设矛盾，所以 y 只能是负的，把 $y<0$ 带入第一个式子，推出 x 只能是正的，所以 $2x+y=7$ ， $x-2y=6$ ，所以解得 $x=4$ ， $y=-1$ ，所以 $x+y=3$ ，选C选项。

89. 答案：A B C D E H

解析： $-2k+24 > 12$ ，或， $-2k+24 < -12$ ，所以 $k < 6$ 或 $k > 18$ 。

90. 答案：DEF

解析：两边加 $1/(x+y)$ ，得到 $x^2-y^2/(x+y) > 0$ 。化简出来就是 $x-y > 0$ ，然后在选项里找所有满足的条件就好了。

91. 答案：-2

解析： $y=8-|x-1|-10$ ，当 $x>1$ 时可得到截距 -18 ，当 $x \leq 1$ 时可得到截距 -2 ，但是截距 -18 不能在图形中显示，因为 $x=0$ 不在 $x>1$ 的定义域里，很简单 y 截距时 x 为零 把零带进去就ok。

92. 答案：B

解析：快速排除CDE选项的方法：题目只要确定直线上所给两点之间XY都为整数的点有多少个。由所给两点的纵坐标可知其间隔13,14,15,16,17共5个整数，而两横坐标间隔整数个数明显多于纵坐标。所以直接忽略，只看纵坐标。所以最多只能是5。

93. 答案：0.25

解析：把 $K^{(3/2)} = (1/2)^3$ 同时开三次方 即 $k^{(3/2 \cdot 1/3)} = (1/2)^{(3 \cdot 1/3)} \rightarrow k^{(1/2)} = 1/2 \rightarrow k = (1/2)^2 = 1/4$ 。

94. 答案：D

解析：一个例子是 $89+90+1=180$ ，此时89度角的对边不是最长边，注意图形不一定按比例画。

95. 答案：B

解析：BD/AB 直角边比斜边，肯定小于1；BC/DC 斜边比直角边，肯定大于1.

96. 答案：C

解析：同圆或等圆中，同弧或等弧所对的圆周角相等。

97. 答案：D

解析：这题目 说的 A是 矩形 最大面积是25，B是三角形，面积为25，故无法确定。

98. 答案：D

解析：由题，AO为半径，而图中点B的位置不确定，所以没有办法确定AB的长度，选择D。

99. 答案：D

解析：注意图形不是按比例画的，下面那条之间可以任意换位置，所以没法确定x和y的大小。

100. 答案：D

解析：AC 相当于圆的直径，B可以位于圆周的任意一点，所以不能判断AB和BC的关系。

101. 答案：ACE

解析：这道题关键就在于 "could be"，所谓"could be"就是除了“一定不能”以外都能算做could be。第三边大于两边之差，小于两边之和，因此A一定满足，B和D一定不可能，C和E如果X的值取得合适还是"could be" 的。

102. 答案：C

解析：求面积增加多少。。。。三角形边长为4 则面积 $4\sqrt{3}$ ，增加后边长为6 面积 $9\sqrt{3}$ ，增加125%。

103. 答案：E

解析：以8为长度画一条线段，以线段的某一端为圆心画一个半径为6的圆，圆周上任意一点（除了与线段重合的直线与圆相交的两点外）与圆心组成的半径与线段都可以成为一个三角形，则三角形的面积最大为半径与线段垂直，最小即为半径无限接近于线段重合的直线。

104. 答案：E

解析：解析：正方形面积是625，所以CD=25，所以CE=25，菱形面积500，所以菱形的高是20，那么把FE延长，和AC交一点G，那么CEG这个三角形的面积可以根据勾股定理算出来等于150，上面的长方形面积等于125，所以阴影部分面积是150+125=275。

105. 答案：D

解析：一年计息m次，n年末本息和为 $(1+i/m)^{nm}$ 所以带入得知D选项最大。

106. 答案：126

解析：根据题意列出方程：

$$Tuk=1.6Kim$$

$$Lee=0.5Tuk$$

$$Pat=1.25Lee$$

$$Pat=126$$

最后可以算出Kim=126。

107. 答案：BE

解析：计算即可，仔细就不会错。

108. 答案：B

解析：注意percent, $0.05\text{percent}=0.0005$ 。

109. 答案：D

解析：本题没说x的正负，所以无法判断哪个数字大。

110. 答案：A

解析：注意题目中的more，说明A的进价是B的2.5倍，所以最终算出来A的卖价比B的卖价高。

111. 答案：B

解析：设利率为r，则 $61293 \cdot (1+r/4)^{20} = 76662.25$ ，化简,得到 $(1+r/4)^{20} = 1.25$ 。

因为 $1+r/4$ 只比1 大一点的，所以每次 $(1+r/4) \cdot (1+r/4)^n$ 可以看做 $(1+r/4) \cdot 1^n$ 。

于是 $(1+r/4)$ 把1 变到 1.25 一共乘了 20次， 可以看做 是从 1开始 加了20个 $(r/4)$ 。

$r/4=0.25/20$, 解得 $r=0.05$. 选最接近的，即B选项。4.5%

这类题，重点就是 $1.00x$ 这种数的平方，跟给1 加上 $0.00x$ 差不多大。

112. 答案：A

解析： $P(A) \cdot P(B) = P(A) \cdot P(B) = 0.6$ ，所以A和B的概率都要大于等于0.6。

113. 答案：D

解析：这个题其实只需要考虑Jane拿到Ann一样的球的概率，无论Ann拿的是哪个球，Jane都有十分之一的机会和她拿到一样的。

114. 答案：B

解析：87，57是合数，其他都是质数，所以答案是 $4/5 \cdot 3/4 = 3/5$ 。

115. 答案：D

解析：A放在圆周上的任意位置，B可以在A左边或是右边，角A0B为60度，两种可能加起来120度，小于2的概率是 $1/3$ ，大于2的概率是 $2/3$ 。

116. 答案：D

解析：15! 里面有6个3（分别是3，6，9，12，15，其中9里面有两个3），所以 $k=6$ 。

117. 答案：A

解析：在保证拿走的袜子里有2种同色袜子，最少需要移动几次？

没有保证情况下，最少需要拿2次橙色袜子。有保证情况下，最少4次，1黑1灰1橙，另一个任意。

118. 答案：C

解析：有两种情况，一种是把两个3绑在一起插入 5 2 1 1 5，则有6个空，6种插法。第二种是3和3分开插入52115，则相当于从6个空选2个插， $C_6^2=15$ 种。一共 $15+6=21$ 种方法。

119. 答案：C

解析：六个位子 先假设三个男生全部在左 女生全部在右，那么男生间排列的方法就有 $A_3^3=6$ 种，女生也是 $A_3^3=6$ 种；然后因为没规定男女谁在左谁在右，所以讲男女看做整体排列共有 $A_2^2=2$ 种；所以最后是 $6 \times 6 \times 2 = 72$ 种。

120. 答案：C

解析：每个位置上都是奇数的三位正数有多少个？1,3,5,7,9，一共五个奇数，每个位置有五种可能性，因此是 $5 \times 5 \times 5 = 125$ 。

121. 答案：CE

解析：这个题的意思就是从8个中选几个出来组合的数量是56，那么列算式 $C^x_8=56$ ，解出 $x=3$ 或者5。

122. 答案：1800

解析：给定密码的位数，然后找每位的可能性。4位： $6 \times 5 \times 4 \times 3 = 360$ ，5位： $6 \times 5 \times 4 \times 3 \times 2 = 720$ ，6位： $6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$ 。 $360 + 720 + 720 = 1800$ 。

123. 答案：A

解析：由于红绿衬衫除了颜色不同，其他都相同。只需要考虑每个小孩分到什么颜色就可以了。从6个小孩中选3个，分配绿颜色，其他小孩分配红颜色。从6个小孩中选3个的方法共有 $C^3_6 = 20$ 种。

124. 答案：E

解析：可以这么想，一共有22位数，选2时，从21个位选一个数，有21种；1+1的情况，从21个数中选2个空填进去 $C^2_{21}=210$ 种，加起来231中。

125. 答案：A

解析：先不考虑重复，每个人都与三个人握手一共有 $10 \times 3 = 30$ ，但是一个人与另一个人握手相当于自己与另一个人和另一个人与自己握手，因此30要除以2。

126. 答案：D

解析： $210 = 2 \times 5 \times 3 \times 7 = 5 \times 6 \times 7 \times 1 = 5 \times 6 \times 7$

Those are the only sets of digits we can use to for the numbers (any other combination of factors will have two digit factors).

Numbers using 2,5,3,7 = 4!

Numbers using 5,6,7,1 = 4!

Numbers using 5,6,7 (3-digit numbers) = 3!

Answer = $24 + 24 + 6 = 54$ 。

127. 答案：A

解析：8极端情况所有女孩都是左撇子，共18人。男孩一共 $45 \times 0.6 = 27$ ，左撇子人数也是27，那么男孩中左撇子至少为 $27 - 18 = 9 > 8$ 。

128. 答案：C

解析：答案必须是整数，所以女工只能有100个。

129. 答案：105

解析：题目问他们相遇前一小时还差多少路 那意味着各自剩下一小时的路程他们就相遇了，那么就是 $56 \text{ miles/h} \times 1 \text{ h} + 49 \text{ miles/h} \times 1 \text{ h} = 105 \text{ miles}$ 。

130. 答案: E

解析: 设女60人, 男40人, 可知女或者tenued 或者both是90人, 所以90减去60就是男的tenued的人数, 等于30人, 30除以男人的人数40人等于75%。

131. 答案: B

解析: I—假设 $x=-8$, $y=2$, 那么I就不成立了; II假设 $x=-2$, $y=2$, 也不成立; III能够看出 $x<0$, $y>0$, 所以 $xy<0$ 。

132. 答案: C

解析: 能被13整除的质数只有13, 能被2整除的质数只有2, 所以答案选C。

133. 答案: C

解析: A中有53和59, B中有83和89, 都是2个, 所以相等。

134. 答案: D

解析: $5 \times 13 = 65$ or $7 \times 11 = 77$, 所以结果不一定。

135. 答案: B

解析: 3的倍数肯定没问题, 能被3整除, 剩下的数字有两证情况 $x=3n+1$ 和 $x=3n+2$, 分别带入原式子, 结果均可以被3整除, $x^3-x=x(x-1)(x+1)$ x 为正整数, 所以 x^3-x 肯定是3的倍数。

136. 答案: C

解析: 根据题意有 $y\% = x/x^2 = 1/x$, 所以 $xy=100$, 又因为 x 和 y 都是大于5的整数, 所以所以只能是 $x=10$, $y=10$ 。正确答案选C。

137. 答案: D

解析: 虽然25等数字也可以, 但是1被它们除之后也余1。所以选D。

138. 答案: 32

解析: $1600 = 2^7 \cdot 5^3$, 所以以5为底数有四个选择, 以2为底数有八个选择。四个中选一个乘以八个中选一个=32。

139. 答案: ABC

解析: 原式化简得 $w=(x^2+3)y+x$, 分类讨论即可。

1. 若 x 为odd, 则 x^2+3 为even, 此时无论 y 是odd还是even, $(x^2+3)y$ 都是even, w 为odd。

2. 若 x 为even, 则 x^2+3 为odd, 此时再讨论:

a.) 若 y 为even, $(x^2+3)y$ 为even, w 为even

b.) 若 y 为odd, $(x^2+3)y$ 为odd, w 为odd

至此全部情况讨论完毕, AB很容易选出来, 此题容易漏选C。

140. 答案: A

解析: 代数进去可以说通: 例如2和3, 最大公约数1; $2x$, $3y$ 是4和9的话最大公约数仍是1; $2x=3y=6$ 的话最大公约数就是6了, 所以cannot determine。

141. 答案: E

解析： $n^2=2^2 \times 3^2 \times 5^2 \times 7^2 \times 11^2 \times 13^2 \times 17^2$ ， $600=2^3 \times 3 \times 5^2$ ，前面只有两个2相乘，后面有3个2相乘，所以无法被600除尽，I错。要让 $n+19$ 被19整除， n 也得被19整除，但是 n 不能背19整除，II错。原式= $n/2+2$ ， $n/2$ 是奇数，所以原式也是奇数，III错。答案选E。

142. 答案：A

解析： $16000=2^7 \cdot 5^3$ ，根据题目条件， $16000=2^x \cdot (4 \times 5)^y = 2^x \cdot 2^{2y} \cdot 5^y$ ，所以 $y=3$ ， $x=1$ 。

143. 答案：A

解析： $3x$ 是奇数， $2y$ 是偶数，所以 $(3x - 2y)$ 是奇数，I对；当 $y=0$ 时， $xy^2=0$ ，所以II不对（注意题目中的must be true）；当 $y=0$ 时， $(y^2-x)>0$ ，III错。

144. 答案：A

解析： 只有prime number的平方才只有三个divisor，即 $X^2 < 900$ ，且 X 为prime number。要挑出所有 <30 的prime number，所以只有2, 3, 5, 7, 11, 13, 17, 19, 23, 29，一共10个。

145. 答案：C

解析： 这些数字包括2, 15, 28, 41, 54, 67, 80, 93，注意2除以13的余数也是2。

146. 答案：AC

解析： 原式= 560^4

$$\begin{aligned} & (560^5 - 560^4) / 559 \\ &= (560 \cdot 560^4 - 560^4) / 559 \\ &= [(560 - 1) \cdot 560^4] / 559 \\ &= (559 \cdot 560^4) / 559 \\ &= 560^4 \end{aligned}$$

故A正确

选项B：

$$\text{原式} = 560^{-10}$$

故B错误

选项C：

$$\text{原式} = 70^4 \cdot 8^4 = 560^4$$

故C正确

选项D：

$$\text{原式} = 560^8$$

故D错误。

147. 答案：C

解析： consecutive意味着是连续的数，那么这一定是平均分布的。所以中数和平均数相等。特别地，当观察值有偶数个，通常取最中间的两个数值的平均数作为中位数。

148. 答案：C

解析： 因为该数为偶数，而余数为3，因此商与除数的乘积必为奇数，因此商必为奇数。设商为 $2k+1$ （ k 为大于等于零的整数），则该偶数可表示为 $7(2k+1)+3$ ，化简，得 $14k+10$ 。因此余数必为10。

149. 答案：D

解析：至少有一个小组包括3人，剩下的17人分成 $(n-1)$ 的小组，题目要求各组相差不超过1，所以，当其他组人数尽可能为2时， n 最大为9，当其他组人数尽可能为4时， n 最小为6。

150. 答案：D

解析：假设 $4^+=4.1$ ， $20^+=20.1$ ，又假设 $20^+=20.9$答案一个小于5一个大于5，B是 5^+ 不是5。

151. 答案：D

解析：领带皮带那道题跟单价无关，但是跟单价比有关。

简略版解答：

假设领带的单价小到微乎其微，而皮带的皮带则大到无穷大，则皮带的折扣既总和的折扣，即30%反之，则20%。选择D。

152. 答案：E

解析：自然数中大于2的质数都为奇数，而奇数加减奇数一定是偶数，所以答案会在BCE中产生。但是 $n=5$ 时，B可以排除， $n=3$ 时，C可以排除，只能选E。

153. 答案：E

解析：设原数A为 $10000a+1000b+100c+10d+e$ 则它的倒影B为 $10000e+1000d+100c+10b+a$ ， $A-B=9999a+990b-990d-9999e=9(1111a+110b-110d-1111e)$ 能被9整除，选E。

154. 答案：C

解析：what fraction of those who do not have brown hair have red hair?意思是：在那些不是棕色头发的人里，是红发的人占多少？非brown 45%，red: $100\%-80\%=20\%$ ，所以是 $20\%/45\%=4/9$ 。

155. 答案：E

解析：某资金市场帐户上个月全月余额为\$48,000,获得了\$360的月利息.那么上个月该帐户是按照多少年利率（单利）获得利息？

$[(360 \times 12) / 48,000] \times 100\% = 9\%$

156. 答案：E

解析：10 11 12 13 14 -10 -11 -12 -13 -14。

157. 答案：B

解析：是8的倍数也一定是2的倍数。所以 $1000/8 = 125$ positive integers divisible by 8. $125/1000 = 1/8$ is the answer。

158. 答案：C

解析：设x为抵押贷款 mortgage，首付down payment+保险insurance premium=6000，首付为 $4\% \times 25000 + 5\% (x - 25000)$ ，保险为 $3\%x$ ，两式和为6000，解出 $x=78125$ 。

159. 答案：D

解析：这个题目说的是：某个节日的日期是X月的第四个星期二，如果X月有30天的话，那么这个节日可能的日期有几个？

并不是说的有30天的月份有几个？

答案是7个。因为如果1日是星期二，那么第四个星期二是22日（该节日的第一个可能日期），同理，可以看出这个节日还可能是23日、24日、25日、26日、27日、28日。

160. 答案：D

解析：从4个中选2个+从4个中选3个+从4个中选4个=11个。

161. 答案：C

解析：这么理解吧：3inch的绳子要剪多少次才能剪完，每次剪1/16inch，这样的话是3除以十六分之一是48，但是最后一次不用剪了 所以是47次，也可以这么想 一条绳子剪多少次可以剪完，显然最后一个1/16inch当然不用减了。

162. 答案：C

解析： 3^n 数字有一个特征，就是它的个位数会存在1, 3, 9, 7的循环，对应的n分别是4k, 4k+1, 4k+2, 4k+3, 283是4k+3，所以 3^{283} 的个位数是7，所以除以5的余数是2。

163. 答案：A

解析：如果n是正的奇数，那么 $k=n^3+2n$ 一定是奇数，所以 $(-1)^k - (-1)^{k+1} = -1 - 1 = -2$ 。

164. 答案：A

解析：注意 2^6 里面不含3，所以不可能有数字能够既等于 $3n$ 又等于 $2^6/m$ 。

165. 答案：D

解析：注意这个题没有说这10000个数字是均匀分布的，所以 n^{th} 和70的大小是无法比较的。

166. 答案：D

解析：此题可以用带入求值的方法来进行计算，可知当一个数是49，另外一个数字是62的时候，两个数字的差为13，是最小的。

167. 答案：A

解析：分子的表达方式是从小于5个盘子中选2个，一共有10种选法，然后有3个不同的set，所以再乘以3，所以分子是30，分母是从15个盘子中选2个，算出来是105，所以最终答案是 $30/105=2/7$ 。

168. 答案：ACE

解析：根据题目的要求我们可以画出顺序 SJMK，P可以在除了K右边的任意位置，所以带入四种情况发现median可能是Mike，Jim和Pete。

169. 答案：-3

解析：这个题要多思考，连续7个整数的乘积是中数，则中数一定是0，这样乘积也是0。然后再根据consecutive倒推，得知最小的数字是-3。

170. 答案：如果背下了，这个题你就对了，如果没有背下，这个题你就错了！