1.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

2. 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?

3. 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?

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%

4. 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

5. 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.

6. 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%

7. (1-x)/(x-1) =1/x

Quantity A x
Quantity B -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.

8. 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.

9. 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.

10. 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

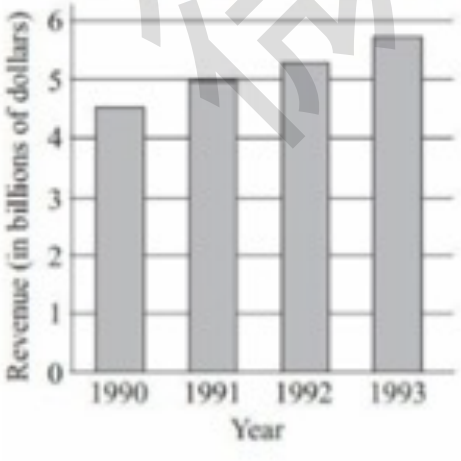
A. 20
B. 30
C. 40
D. 60
E. 80

11. 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

SELECTED DATA FOR GREETING CARD SALES

Annual Revenue from All Greeting Card Sales, 1990–1993



Number of Greeting Cards Sold for Ten Occasions in 1993

Occasion	Number of Cards
Christmas	2.4 billion
Valentine's Day	900 million
Easter	158 million
Mother's Day	155 million
Father's Day	102 million
Graduation	81 million
Thanksgiving	42 million
Halloween	32 million
St. Patrick's Day	18 million
Jewish New Year	12 million
Total	3.9 billion

Note: 1 billion = 1,000,000,000

12.
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.

13. 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?

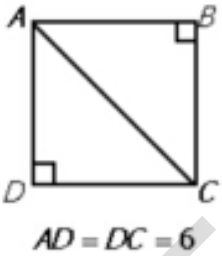
14. What is the sum of all possible solutions of the equation $|x + 4|^2 - 10|x+4| = 24$
A. -16
B. -14
C. -12
D. -8
E. -6

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

16.
Quantity A x
Quantity B y

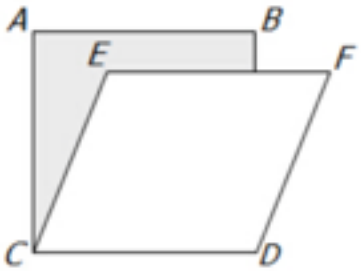
A. Quantity A is greater.
B. Quantity B is greater.
C. The two quantities are equal.
D. The relationship cannot be determined from the information given.

17.
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.

18. 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



19.
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.

20. 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

21. 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

22. 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

23. 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

24. 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.

25. 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

26. 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.

27. 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

28. How many integers from 1 to 900 inclusive have exactly 3 positive divisors?
A. 10
B. 14
C. 15
D. 29
E. 30

29. 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 pay 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.

30. What's the nearest value of $\frac{0.888888^{27}\times 0.333333^{6}}{0.592592^{20}\times 0.444444}$?

A.4.5
B.5.0
C.6.3
D.10.2
E.8.4

31. If $1 \leq n \leq 100$, and $\frac{n+7}{2}$ is a multiple of 4 but not a multiple of 3, then which of the following could be true? Indicate all possible values.

A. n is even

B. n is odd

C. n is prime

D. n is a multiple of 3

E. n is a multiple of 4

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

Quantity A	Quantity B
r	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.

33. Sixty-eight people are sitting in 20 cars and each car contains at most 4 people. What is the maximum possible number of cars that could contain exactly 1 of the 68 people?

A. 2

B. 3

C. 4

D. 8

E. 12

34. The “reflection” of a positive integer is obtained by reversing its digits. For example, 321 is the reflection of 123. The difference between a fif-digit integer and its reflection must be divisible by which of the following?
A. 2
B. 4
C. 5
D. 6
E. 9

35. 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. 1/4
B. 4/11
C. 4/9
D. 5/9
E. 4/5

36.
Quantity A: The two-digit integer that equals twice the sum of its digits
Quantity B: 16

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.

APPARENT FAHRENHEIT TEMPERATURES
DUE TO WIND-CHILL FACTOR
(corresponding to actual temperatures and wind speeds)

WIND SPEEDS (miles per hour)	ACTUAL TEMPERATURES (degrees Fahrenheit)				
	-10	0	10	20	30
5	-15	-5	7	16	27
10	-34	-22	-9	3	16
15	-45	-31	-18	-5	9
20	-53	-39	-24	-10	4
25	-59	-44	-29	-15	1
30	-64	-49	-33	-18	-2
35	-67	-52	-35	-20	-4
40	-69	-53	-37	-21	-5

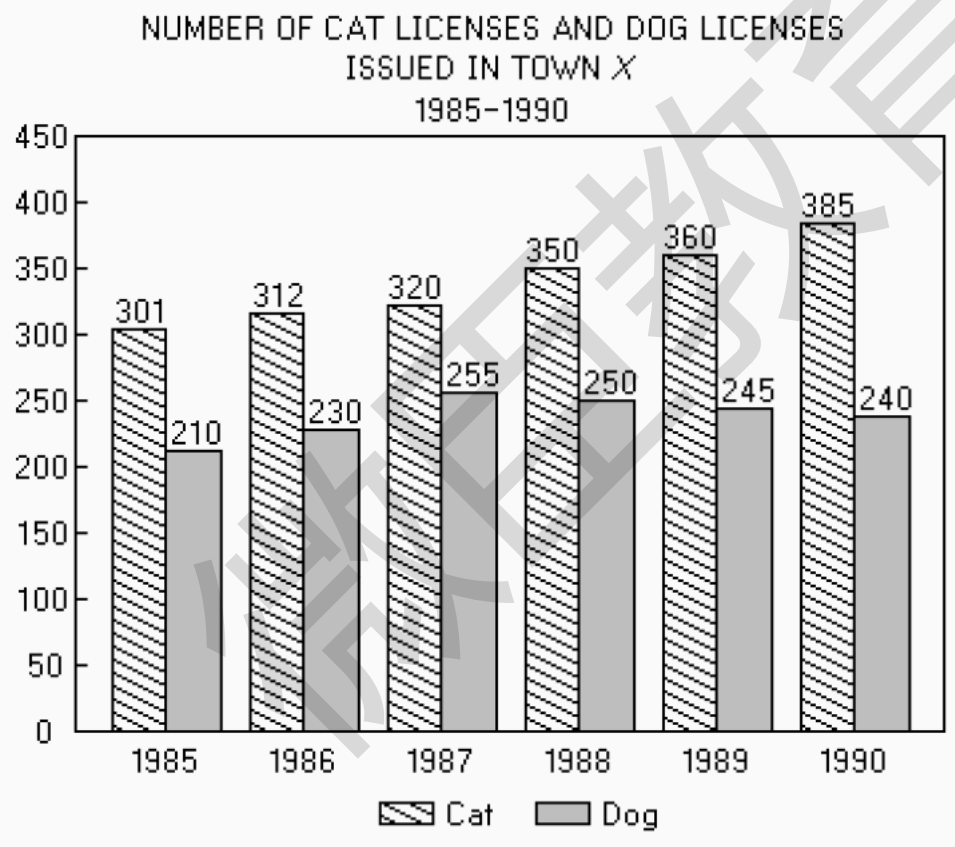
37. If the actual temperature is 13 degrees Fahrenheit and the wind speed is 14 miles per hour, then the apparent temperature could be:
A. 5 degrees Fahrenheit
B. -12 degrees Fahrenheit
C. -20 degrees Fahrenheit
D. -25 degrees Fahrenheit
E. -32 degrees Fahrenheit

38. Which of the following can be inferred from the table?
I. The apparent temperature for an actual temperature of 20 degrees Fahrenheit and a wind speed of 15 miles per hour is the same as that for an actual temperature of 30 degrees Fahrenheit and a wind speed of 40 miles per hour.
II. At a constant wind speed, as the actual temperature increases, the difference between the actual and the apparent temperatures also increases.
III. At a constant actual temperature of -10 degrees Fahrenheit, the apparent temperature decreases at a constant rate as the wind speed increases.

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

39. If the average (arithmetic mean) of x, y, z, 5 and 7 is 8, which of the following must be true?
I. The median of the five numbers cannot be 5.
II. At least one of x, y and z is greater than 9.
III. The range of the five numbers is 2 or more.

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



40. According to the graph, which of the following statements must be true?
I. For each of the years 1986 through 1990, the number of cat licenses issued was greater than that of the previous year.
II. In Town X more households had dogs in 1986 than in 1985.
III. For at least one of the years shown, the number of cat licenses issued was more than 1.5 times the number of dog licenses issued.

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

41. 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.

42. When the positive integer n is divided by 7, the quotient is q and the remainder is 4. When 2n is divided by 7, the remainder is 1 and the quotient, in terms of q, is
A. q/2
B. q/2 +1
C. 2q
D. **2q+1**
E. 2q+2

43. The decorating committee for a dance plans to fringe the 3-inch-wide end of a streamer by making small cuts every 1/16 inch. How many cuts must be made to fringe the end?
A. 45
B. 46
C. 47
D. 48
E. 49

1-5 AC 121 11/17 E B
6-10 C B B B BCDE
11-15 CDEFGH B 108 D B
16-20 D D E D D
21-25 C E D A E
26-30 D A A C A
31-35 BCD C C E C
36-40 A B A E E
41-43 D D C