1. If I reverse the digits in a two-digit number, the number increases by 18. What is the greatest possible sum of the new number and the old number?

(a) 143

(b) 158

(c) 176

(d) 189

2. Jack is driving down a straight road in his car. He drives for two hours at 45 miles per hour and then for three more hours at 40 miles per hour. How far, in miles, does Jack travel in total?

(a) 210

(b) 258

(c) 276

(d) 289

3. John is trying to guess the locker combination to a lock. The lock code is a 3 digit number, with the digits from 0 to 9. He knows that the first digit is not a 9 and the second digit is not a 9. He also knows that the product of the digits is 0. What is the maximum possible sum of the digits of the locker code? (The first digit can be zero)

(a) 17

(b) 12

(c) 11

(d) 18

4. A man is born in 1900 and dies in 2000. He is not 100 years old when he dies. How old is he?

(a) 99

(c) 82

(b) 88

(d) 92

5. Find the area of the triangle bounded by the x-axis, the y-axis, and the line y = -7x + 14.

(a) 30

(c) 14

(b) 17

(d) 21

6. Evaluate the following:

$$(-0)+(-1)-(-2)+(-3)-(-4)+(-5)-(-6)+(-7)-(-8)+(-9)-(-10)+...+(-99)-(-100)$$

(a) 50

(c) 30

(b) 20

(d) 40

7. Henry has two red balls, three blue balls, and one white ball. All balls of the same color are indistinguishable. How many ways are there of arranging the six balls in a line?

(a) 80

(c) 50

(b) 40

(d) 60

8. Find the value of the following:

$$\frac{1}{1\cdot 2}+\frac{1}{2\cdot 3}+\frac{1}{3\cdot 4}+\cdots+\frac{1}{99\cdot 100}$$

(a) 88/100

(c) 66/100

(b) 99/100

(d) 77/100

9. If I have twenty-five meters of wire and want to use it to make a rectangle with the biggest possible area, what is the area of that rectangle in square meters?

(a) 625/16

(c) 242/16

(b) 325/16

(d) 715/16

10. Kemp's book has 707 pages. How many sixes will he come across in the page numbers?

(a) 348

(c) 241

(b) 235

(d) 582

11. John buys 5 ice creams and 3 steaks for $9. Ben buys 13 ice creams and 15 steaks for $27. If Fahmid buys one ice cream and one steak, how much does he pay?

(a) $1

(c) $2

(b) $3

(d) $5

12. Jack is solving a calculus problem that requires him to give a single integer answer. Let p be the probability he gets the problem right and q be the probability he gets the problem wrong. Assuming that there is no partial credit, what is p + q?

(a) 5

(c) 7

(b) 2

(d) 1

13. Irfan is filling in a sequence with a specific pattern: 1, 2, 3, 6, 11, 20, 37, 68, a, b. Compute a - b.

(a) -105

(c) -106

(b) -107

(d) -108

14. What is the last digit of 2^{16}?

(a) 2

(c) 3

(b) 6

(d) 4

15. The area of a square is equal to its perimeter. What is its side length?

(a) 2

(c) 3

(b) 6

(d) 4

16. If one Jenny equals two Kristinas, three Kristinas equal six Lisas, and ten Lisas equal fifteen Margoes, how many Jennies equal 180 Margoes?

(a) 30
(c) 50
(b) 40
(d) 60

17. How many integers from 1 to 100 (inclusive) leave a remainder of 2 or 4 when divided by 5?

(a) 25
(c) 30
(b) 40
(d) 60

18. The cost of supplying food for Tom's party was $1000. If the cost of entrance to the party is $5, how many people need to come for Tom to have $500 left (after paying for the food) to buy presents for himself?

(a) 200
(c) 500
(b) 400
(d) 300

19. What is the largest integer we cannot obtain by adding 3's and 7's?

(a) 11
(c) 13
(b) 12
(d) 14

20. Henry is preparing for the Intermediate Math Open. Each day, he does two more problems than he did the previous day. If he did one problem the first day, how many problems will he have done after the eleventh day?

(a) 81
(c) 121
(b) 64
(d) 49

21. Evaluate the following:

$$(-3)\cdot(-2)\cdot(-1)\cdot\frac{1}{36}\cdot(1)\cdot(2)\cdot(3)$$

(a) -1
(c) 4
(b) 3
(d) -2

22. The sum of three consecutive even numbers is 30. What is the product of the first two numbers?

(a) 80
(c) 70
(b) 75
(d) 65

23. If $x^2y = 30$, find "x" when y=120, x<0.

(a) -7/2
(c) -1/2
(b) -3/2
(d) -5/2

24. Fatima has an unknown number of gumballs. If she gives one-third of her gumballs to Jim, then Fatima and Jim will have the same number of gumballs. If Jim originally had 17 gumballs, how many gumballs did Fatima originally have?

(a) 21
(c) 41
(b) 31
(d) 51

25. How many integers from 1 to 100 inclusive are multiples of 12 but not 15?

(a) 4
(c) 6
(b) 5
(d) 7

26. Keshia has only dimes and quarters in her coin purse. She notices that if she adds five pennies, eight nickels, and four dimes to her purse, she doubles the amount of money. What is the maximum number of coins with which she could have started out?

(a) 8
(c) 6
(b) 9
(d) 7

27. Evaluate the following:

$$\frac{1}{\frac{1}{2}+\frac{1}{4}}$$

(a) 11/3
(c) 2/3
(b) 4/3
(d) 7/3

28. Anderson goes to school for nine hours. When he gets home at 5:00 P.M., he does two hours of math. He then spends an hour eating, and does math until 1:00 A.M. He then goes to sleep for seven hours. If Anderson does not multitask and can go to and from school in no time, what percent of the day does he spend doing math?

(a) 7/24

(b) 11/24

(c) 5/24

(d) 13/24

29. The angles A, B, C, and D ($A < B < C < D$) in a quadrilateral form an arithmetic series. What is $(B+C)/(A+D)$?

(a) 2

(b) 3

(c) 4

(d) 1

30. How many positive integers less than 80 have exactly four factors?

(a) 22

(b) 10

(c) 12

(d) 14

31. A circle is inscribed in a square with a side length of 2. What is the area of the square not inside the circle?

(a) Π+4

(c) 8-Π

(b) Π+8

(d) 4-Π

32. If Starbursts are only sold in bags of 6, what is the least number of bags Austin must buy to get 49 Starbursts?

(a) 8

(c) 9

(b) 10

(d) 7

33. Define a?b to be equal to (2a+3b)/(a-b). Find (3?4)?2.

(a) 1.8

(c) 2.8

(b) 3.5

(d) 1.5

34. Austin bought a 72-foot long wire fence for his rectangular garden and wants to surround the biggest possible area. One side of the garden is adjacent to his house, so he only needs to surround three sides. In square feet, what is the biggest area he can surround?

(a) 813 sq.feet

(c) 576 sq.feet

(b) 625 sq.feet

(d) 326 sq.feet

35. Many integers can be expressed as a sum of 3 perfect squares. For example, $5 = 2^2+1^2+0^2$. 7 is the smallest positive integer which cannot be expressed in this way. What is the next smallest integer that cannot be expressed as a sum of 3 perfect squares?

(a) 12

(c) 13

(b) 15

(d) 14

36. What is 2 + 2 x (2 + 2 x (2 + 2 x (2 + 2 x 2)))?

(a) 62

(c) 63

(b) 65

(d) 64

37. Peterson is stacking blocks in a pyramid. The first layer contains two blocks, the second layer contains four blocks, the third layer contains six blocks, and so on. If the pyramid has seventeen layers, how many blocks is it composed of?

(a) 206

(c) 306

(b) 506

(d) 406

38. What is the largest integer n such that n and n+13 are both perfect squares?

(a) 26

(c) 36

(b) 56

(d) 46

39. Daniel and Zen are dividing thirty apples. Daniel only wants a multiple of two apples while Zen only wants a multiple of three apples. Each wants at least one apple. How many ways can they divide the apples amongst themselves so that no apples are left over?

(a) 2

(c) 3

(b) 5

(d) 4

40. Evaluate 12 + 34 x 56.

(a) 1916

(c) 3916

(b) 2916

(d) 4916

41. The Zen County Academies math test has fifty problems and lasts one hour and thirty minutes. If Jack decides to spend the same amount of time on each problem, how many minutes will he spend on problem 42?

(a) 4.8 minutes

(c) 2.8 minutes

(b) 3.8 minutes

(d) 1.8 minutes

42. If a + b + c = 5 and 2a + 2b + c = 8, what is the value of c?

(a) 5

(c) 3

(b) 4

(d) 2

43. A hamburger costs $5.95 and a soda costs $2.55. In cents, how much does a person pay to buy two hamburgers and two sodas?

(a) 1700 cents

(c) 1800 cents

(b) 1900 cents

(d) 2000 cents

44. In a zoo with thirty animals: some are rabbits and the rest are penguins, Lily counts thirty-five pairs of legs. How many penguins are there?

(a) 22

(c) 24

(b) 25

(d) 23

45. Shan and James were going for a walk when they noticed that the rocks on the pathway formed a pattern. The first stone was light gray, the second stone was medium gray, the third stone was dark gray, the fourth stone was white, the fifth stone was light gray, etc. If the pattern continues, what color will the 333rd stone be?

(a) Light gray

(c) Dark gray

(b) Medium gray

(d) White

46. If the ratio of the circumference to the area of a circle is 1 : 3, what is its radius?

(a) 6
(c) 2
(b) 5
(d) 7

47. In how many ways can 7 be written as a sum of three (not necessarily distinct) positive whole numbers? The order of the numbers does not matter.

(a) 6
(c) 2
(b) 5
(d) 4

48. If $x + 2x + 3x = 6$, find x.

(a) 1
(c) 2
(b) 5
(d) 6

49. At a tennis tournament, every player plays exactly one match against each of the other players. How many matches will be played if twenty people participate?

(a) 190

(c) 98

(b) 100

(d) 70

50. Compute:

$$9 \cdot (1.0000 + 0.10000 + 0.01000 + 0.00100 + 0.00010 + 0.00001) + .00001$$

(a) 10

(c) 20

(b) 50

(d) 60

Answers:

1. c	2. a	3. a	4. a	5. c	6. a
7. d	8. b	9. a	10. c	11. c	12.d
13.a	14. b	15. d	16. a	17. b	18. d
19. a	20. c	21. a	22. a	23. c	24. d
25. d	26. d	27. b	28. a	29. d	30. a
31. d	32. c	33. d	34. c	35. b	36. a
37. c	38. c	39. d	40. a	41. d	42. d
43. a	44. b	45. a	46. a	47. d	48. a
49. a	50. a				