5^{th} Grade Competition

Bergen County Academies Math Competition 2006

22 October 2006

1. To get ready for a math competition, Kevin buys a pencil for fifty cents, a ruler for one dollar, and graph paper for thirty dollars. How much money does Kevin spend?

2. If CNN is on channel 25 and YES is on channel 70, how many times does Michael have to hit the "channel up" button in order to switch from watching CNN to YES?

3. Brian likes to feed the ducks. The first day he uses 1 slice of bread. The second day he uses 2 slices of bread. The third day he uses 3 slices of bread. If this pattern continues, how many slices of bread will he use on the tenth day?

4. Chang is illegally cruising down Route 4 in his father's car. There are numbered markers along the route, each spaced one mile apart, which indicate how far one has travelled. If Chang starts at the 94^{th} mile marker and the police stop him at the 117^{th} mile marker, how many miles did Chang travel?

5. $2 \times 0 \times 0 \times 6 =$

6. Mrs. Stone makes 20 telephone calls per day. How many telephone calls does she make in the month of January?

7. Calculate $10 - 9 + 8 - 7 + 6 - 5 + 4 - 3 + 2 - 1$.

8. Arthur accidentally added 7 to a number instead of multiplying that number by 7 on a math problem. His answer was 11. What should he have gotten as an answer?

9. To be prepared, Yoonjoo wants to carry 10 pencils with her at all times during school. Every hour, she gives one pencil to a friend and loses one pencil. If school is 8 hours long, at least how many pencils must Yoonjoo bring to school to remain prepared?

10. James's pet alligator has a body and a tail that together are 5 times as long as its head. From the tip of its nose to the tip of its tail the giant alligator is 300 meters long. How many meters long is its head?

11. Asena and Christine are playing a game. Asena asks Christine to pick a number. She then asks her to add 12 to that number, multiply her answer by 3, subtract 36 from her new answer, divide that answer by 6, and multiply this answer by 2. If Christine picks the number 10 in the beginning, what number does she have at the end?

12. Aaron knows he has somewhere between 100 and 110 baseball cards in his collection. If he counts his cards 2 at a time, he has 1 card left over. If he counts his cards 5 at a time, he has 2 left over. How many cards are in Aaron's collection?

13. Express $\frac{11}{5}$ in decimal form.

14. In Eddy's sock drawer, there are two red socks, three blue socks, and two green socks. If Eddy takes socks out of the drawer one at a time and does not put them back, how many must he take out so that he can make at least one matching pair?

15. A military clock, instead of having the numbers 1 through 12, has the numbers 1 through 24 evenly spaced around the circular face. What is the number directly across from 19?

16. For a class trip, Mr. Holbrook hires 2 buses, which can each hold 50 students. However, 123 students signed up for the trip. If a car can hold up to 4 students, what is the minimum number of cars needed in addition to the two buses to ensure that every student has a ride?

17. Two numbers have a sum of 15 and a product of 36. What is the larger of the two numbers?

18. In a high school physical education class, 11 students know how to climb a tree. 6 of these students are male. There are 14 boys total in the class. 7 girls in the class do not know how to climb a tree. How many students are there in this class?

19. $20 + 40 + 60 + 80 = (1 + 2 + 3 + 4) \times \underline{\quad ? \quad}$

20. Mike arrived at a party 27 minutes before 3 : 23 PM. What time was it 11 minutes after he arrived?

21. If Eugene counted to 600 by 6's, starting with 6, how many numbers did he count that are less than 600?

22. A triangle has a base of length 5 inches and a height to that base of length 8 inches. What is the area, in square inches, of the triangle?

23. If a bird's wings flap 64 times every second, then how many times do a bird's wings flap in 10 minutes?

24. If a race began at 3 : 43 PM and ended at 5 : 57 PM the same day, the race was half over at what time?

25. Will is 11 years old, and his sister is 7 years old. What will be the sum of Will's age and his sister's age when Will is 26 years old?

26. Hannah goes to Boston Market to eat lunch. She picks a piece of chicken for her main meal, and must select a side dish and a drink. The possible side dishes are mashed potatos, corn, green beans, and cinnamon apples. The possible drinks are Coca Cola, Sprite, orange soda, iced tea, lemonade, and water. How many different meals can Hannah select?

27. If the same number of 3's, 5's, and 7's are added together to get a sum of 105, what is the total number of 3's used in the sum?

28. Dan likes bowling, pool, and math. He decides to number the 10 bowling pins 1 through 10 and adds up the numbers on each pin, obtaining a number P. Then he numbers each of the 15 pool balls 1 though 15 and adds these up to obtain a number B. Find $B - P$.

29. Compute $(1 + 2 + 3 + \cdots + 98 + 99) \div (.01 + .02 + .03 + \cdots + .98 + .99)$.

30. Ashley's calculator only performs one process: when she enters a number, the calculator shifts the entire number one decimal place to the right, adds 11, and returns the resulting number. For example, if she enters 11, the calculator shifts 11 a decimal place to the right to give 1.1, then adds 11 which gives 12.1. If she gets back 32.5 as an answer, what was her original number?

31. Caroline chooses a whole number greater than 1. She divides $1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7$ by that whole number. Then she divides the quotient by the same whole number. She continues dividing each new quotient by the same whole number until the remainder is no longer 0. Which whole number should Caroline choose so that she performs the division the greatest number of times?

32. Counting from either end of the line, Michelle is 18^{th} in line. How many people are in the line?

33. Ian and Rob are having a barbecue. Ian goes to Shoprite and buys 62 ounces of meat. Rob goes to Pathmark and buys 82 ounces of meat. In total, how many *pounds* of meat did Ian and Rob buy? (There are 16 ounces in one pound.)

34. Sixteen teams compete in a soccer tournament. Each game, one team wins and one team loses, and the losing team is eliminated. How many games must be played so that only one team remains undefeated?

35. Dr. Mayers raises chickens and rabbits in his classroom. He counts 45 total animals, and 144 legs (each chicken has 2 legs, while each rabbit has 4 legs). How many rabbits does Dr. Mayers have?

36. What is the remainder when 6668 is divided by 6?

37. Sally has 7 coins, which together make 72 cents. Each coin is a penny, nickel, dime or quarter. How many dimes does Sally have?

38. 9 is 15% of what number?

39. Connie took a test with 25 questions. For every question she got right, she earned 4 points, and for every question she got wrong, she lost 1 point. She answered every question, and got a score of 80. How many questions did she get right?

40. If there are 5 zounds to a zong, 7 zongs to a zig, and 3 zigs to a zap, how many zounds are there to 3 zaps?

41. In 4 ponds, there are 33 ducks. For any arrangement of ducks in these ponds, you can find at least one pond with at least n ducks. What is the largest possible value of n?

42. Ben, Joe, Rob and Mike like to play ping-pong after math team. Each played exactly 3 games of ping-pong with each of the others. How many games of ping-pong were played altogether?

43. Rachel begins writing the non-negative whole numbers (0, 1, 2, ...) across a sheet of paper in increasing order, with no spaces between them. She stops when she reaches the end of the paper. There is only room across the paper for 100 digits. What is the last digit Rachel writes?

44. A can of mango juice concentrate is mixed with 3 cans of water to make $1\frac{1}{2}$ pints of mango juice. Each can of water is the same size as the can of mango juice. What fraction of a pint does one can hold?

45. The sum of five different positive integers is 100. What is the largest possible value for any one of these integers?

46. How many perfect squares are there between 2 and 140?

47. Sujin paints $\frac{1}{4}$ of a pole green. Christine then paints $\frac{2}{3}$ of the pole red, and leaves the remaining 2 feet unpainted. How many feet long is the entire pole?

48. A *palindrome* is a number that reads the same left to right as it does right to left. For example, 123321 is a palindrome. How many palindromes are there greater than or equal to 1 and less than 100?

49. The average (arithmetic mean) of five numbers in a list is 35. The average of the first two numbers is 26. What is the average of the last three numbers?

50. How many positive divisors does 5040 have?