





## 2008 Primary Math World Contest Tryouts Problems

Name: \_\_\_\_\_ Grade: \_\_\_\_\_ Date: \_\_\_\_\_

20 problems (generally ordered from the easiest to the hardest) in 45 mins. No calculator is allowed. Only correct answer counts. No partial credit would be given. Harder problems would be used for tiebreak.

- 1) The sum of the ages of both of my parents now is 70. What was the sum of their ages six years ago?
  
- 2) “One million = 1,000,000”. United States refers a billion to be a thousand million and some country defines a billion to be a million million. What would be the ratio of US billion to that country’s billion?

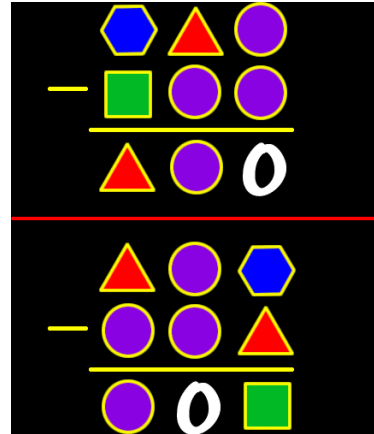
- 3) Four different shapes: , , , , are used in the two problems on the right. Each shape represents either 1, 2, 4, and 6 but not necessary in that order. Can you figure out what number each shape represents so that both math problems work?

$$\text{Hexagon} = ?$$

$$\text{Square} = ?$$

$$\text{Triangle} = ?$$

$$\text{Circle} = ?$$



- 4) Put a single digit in each box to make the problem correct:

$$\begin{array}{r} \square \square \square \\ \quad \times \square \\ \hline 1090 \end{array}$$

- 5) When 37 is divided by N, it leaves a remainder of 7. For how many different whole numbers can N be?

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- 6) A digit is placed in each of the 11 boxes below such that the sum of any three consecutive boxes is equal to 21. We know that digit “7” is in box 1 and digit “6” is placed in box 9 (counting from left to right). What would be the digit for box 2?

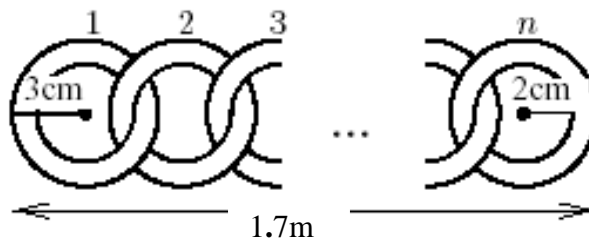
<b>7</b>	<b>?</b>							<b>6</b>		
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- 7) Alice’s phone number is a 7-digit number where each digit is greater than each of the digits to its left. Her phone number doesn’t start with 0 or 1. How many different phone numbers are there that have these properties?

- 8) Andrea plays a game similar to Sudoku. She places one number from the set {1, 2, 3, 4} in each square of the 4 x 4 diagram in such a way that each row and each column contains different number chosen from the set. The initial diagram was given at right. How many different ways/diagrams can Andrea finish the game?

1			
2	1		
	3		
	4		

- 9) Rings with dimensions shown in the figure were linked together, forming a “1.7m” long chain. How many rings were used to create this chain?



- 10) If today is Saturday, what day of the week will it be  $2^7$  days from now?

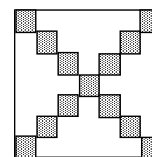
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11) There were 770 nuts divided among three girls in proportion to their age. For every three nuts taken by Anita, Bibian took four nuts, and for every seven nuts taken by Caroline, Bibian took six nuts. How many nuts did the youngest girl get?

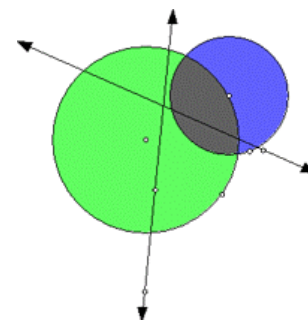
12) Compute:  $\frac{1}{7} + \frac{1}{8} + \frac{1}{9} + \frac{1}{10} + \frac{1}{11} + \frac{1}{12} + \frac{1}{14} + \frac{1}{15} + \frac{1}{18} + \frac{1}{22} + \frac{1}{24} + \frac{1}{28} + \frac{1}{33} = ?$

13) A square with a side equal to 2008 was divided into small equal squares each with side of 1 unit. Squares along the diagonals were shaded. An example of shading a square with side of 7 units is shown at right. What is the area of the region that is not shaded for the 2008 x 2008 square?



14) In a new version of a dating game shown on TV, two of the three bachelors always lie while the other tells the truth. A woman asks questions of the men from behind a partition. She asks each man, "Which of you is the tallest?" Bachelor 1 replies, "Not me." Bachelor 2 replies, "I am." Bachelor 3 replies, "Not Bachelor 2." Which bachelor is the tallest?

15) What is the maximum number of points of intersections when two circles and six lines intersect each other? (*Sample intersections (which may not be maximum) of 2 circles and 2 lines are shown in the diagram at right.*)



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- 16) Two friends, Chris and Pete, are training at the same circular running track. In order not to look as if they are directly competing against each other, they run around the track in the opposite directions. Chris normally takes 60 seconds to run a complete lap, but finds that they cross each other every 24 seconds by running in opposite directions. How much time (in seconds) would Pete take to run one lap?
- 17) Susan thinks of a secret number. In this sequence: she subtracts 8, multiplies by 8, adds 8, and then divides by 8 to get 2008 as her answer. Peter also thinks of a secret number. In this sequence: he adds 8, multiplies by 8, subtracts 8, and then divides by 8 to get 2008 as his answer. What is the sum of their two secret numbers?
- 18) Let A, B, and C represent different digits greater than zero. Determine the minimum value of the expression: 
$$\frac{ABC}{A+B+C}$$
*Note that for ABC, A is the hundreds digit, B is the tens digit, and C is the ones digit - they are not multiplied together.*
- 19) All numbers that are neither divisible by 5 nor 11 were removed from a sequence of consecutive natural numbers from 1 to 10,000. A new sequence was formed. What is the value of the 2008<sup>th</sup> term of this sequence?
- 20) One Saturday morning, a walker hiked along a cross-country trail with uphill, downhill, and some flat ground paths. He started off at 10 a.m. and traveled back by the same route and reached back to the starting point at 4 p.m. His speed was 3 km/hr uphill, 6 km/hr downhill, and 4 km/hr for flat ground. What was the total round-trip distance that he has walked?