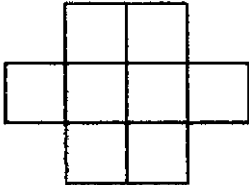


Number/Computation

Problems:

1	An <i>abundant number</i> is a positive integer, the sum of whose distinct proper factors is greater than the number. (The proper factors of a number are all its factors except the number itself.) How many numbers less than 25 are abundant numbers?
2	It is possible to earn 0, 1, 3, 7, or 10 points with each shot in the game of "blippy." How many positive scores less than 30 cannot be made in three shots?
3	A three-digit number, $2A4$ is added to 329, yielding a sum of $5B3$. Find the largest possible value of A such that $5B3$ is divisible by 3.
4	Ms. Smith wrote two numbers on the board and asked her students to calculate the product. The units digit of one number was 8, but it was not written clearly. John mistook this digit for 6 and ended up with the product of 4740. Mary mistook this digit for 3 and ended up with the product of 4695. What should be the correct answer to the teacher's problem?
5	How many integers x in $\{1, 2, 3, \dots, 99, 100\}$ satisfy that $x^2 + x^3$ is the square of an integer?
6	A vendor sells large sodas for \$.70 and small sodas for \$.50. One afternoon, he sold a total of 1000 sodas for a total of \$580. How many large sodas did he sell?
7	Walter rolls four standard six-sided dice and finds that the product of the numbers on the upper faces is 144. Which of the following could <i>not</i> be the sum of the upper four faces? (A) 14 (B) 15 (C) 16 (D) 17 (E) 18

8	<p>Arrange the numerals 1 through 8 so that no two squares containing consecutive integers touch at a side or a corner.</p> <div style="text-align: center;">  </div>
9	<p>A <i>unit fraction</i> is a fraction whose numerator is 1 and whose denominator is a positive integer. How can $19/94$ be expressed as the sum of unit fractions?</p>
10	<p>Rich invested \$100 seven years ago. Since then, his investment has doubled in value to \$200. If Rich's money continues to double every seven years, in how many years will his \$200 grow to \$1600?</p>
11	<p>N is a positive integer whose units digit is a 4. When the 4 is moved from the units place to the front of the number, a new integer M is formed. The new integer is equal to four times N and has the same digits as N. How many digits are in the smallest possible value of N?</p>
12	<p>The number $2^{48} - 1$ has two factors between 60 and 70. What are they?</p>
13	<p>Fastmath: If the retail price for a book is 25 percent more than its cost to the seller, what percent of the final price is profit?</p>
14	<p>How many 9s are in the decimal expansion of 99999989999^2?</p>
15	<p>How many pairs (x, y) of positive integers satisfy $2x + 7y = 1000$?</p>
16	<p>The rails of a railroad are 30 feet long. An audible "click" occurs when a train passes over the points at which the rails are joined. If the train is traveling at a rate of s miles per hour, where s is a whole number, then s is the number of clicks heard in how long a time period?</p>
17	<p>Find the largest prime number that can be written as the sum of two prime numbers</p>

and as the difference of two prime numbers.

18 A driver explains that the number on his car's odometer, 83238, is a palindrome, since it reads the same from left to right as from right to left. He then remarks that the next palindrome will be 83338. What number is the seventh palindrome after 83338?

19 Find all two-digit decimal numbers that are twice the product of their digits.

20 What is the value of $\sqrt{2\sqrt{2\sqrt{2\sqrt{2\dots}}}}$?