

## 2009 MathEdge+ Contest: Intermediate Level

20 problems in 40 mins. No Calculator.

Please box the answer. Only correct answer counts. No partial credit.

- 1) What is the missing number in this sequence? 1, 3, 7, 15, 31, 63, \_\_\_\_, 255.
  
- 2) I am thinking of four consecutive counting numbers. The sum of the first three numbers is 50 more than the fourth number. Find the fourth number.
  
- 3) What is the biggest possible sum for all Sunday dates in the month of April?
  
- 4) The number 15 has four factors: 1, 3, 5, and 15.  
 If a number has exactly six factors, we will call that number "smart".  
 Which of the following numbers would we call "smart"?

8,	16,	17,	20,	24
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- 5) Find the whole number which is: less than 100; a multiple of 3; a multiple of 5; odd, and such that, the sum of its digits is odd.
  
- 6) What could be the smallest product obtained by placing the digits 1, 2, 3, 4, and 5 in the boxes?

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

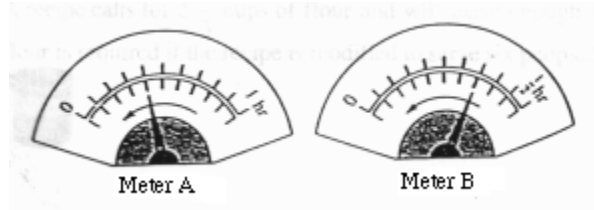
- 7) Two numbers are in the ratio of 3 to 7 and have a sum of 50. What is the smaller of the two numbers?

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- 8) A large  $12 \times 12 \times 12$  large cube was dipped in paint and then divided into  $1 \times 1 \times 1$  unit cubes. How many such unit cubes would have 1 face painted?
- 9) Judy needed 117 square feet of carpet for her new room. She went into a carpet store having a big sale sign: "Everything is 30% off". She selected a carpet that had already marked half off of an original price \$40 a square yard. How much did she pay for the carpeting?
- 10) Container A is quarter full of water. Container B can hold 12 cups of water. After the content of container A is poured into container B, Container B is now  $\frac{2}{3}$  full. How many cups of water can container A hold?
- 11) Two parking meters are pictured with the times left as shown. How much more time does the one meter have left on it than the other?



- 12) Johnny has a dozen pairs of white socks, four pairs of black socks, three pairs of brown socks, and two pairs of blue socks in his drawer. Without looking, how many socks must he pull from the drawer in order to guarantee him a pair of blue socks?
- 13) A palindrome reads the same, forwards and backwards. For example, the words "pop" and "level" are palindromes and "85758" is a palindromic number. What would be the largest positive difference between two 6-digit palindromic numbers?

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- 14) The numbers in the sequence 3, 8, 13, 18, and so on, increase by 5's. The numbers in the sequence 5, 9, 13, 17, and so on, increase by 4's. The number 13 is in both sequences. What is the next number that appears in both sequences?
- 15) The Jones keep their goat on a 4-meter chain connected on a metal hook to the corner of a shed that is rectangular in shape (5 meters by 4 meters). To the nearest tenth, what area of grass in square meters can the goat reach to eat? (use 3.14 for pi)
- 16) A banquet hall has capacity of 400 persons--including both diners and servers. Each server can attend to at most 12 diners. (For example, 24 people would require two servers, but 25 people would need three servers.) What is the maximum number of diners that can be served in the banquet hall?
- 17) A new kind of clock goes tick, tack, tock, ding, dong, and then it repeats. It continues this same sequence of noises, one noise per second. At 1 second after midnight, the clock went "tick." What noise did the clock make at the 88th second after midnight?
- 18) A troll went to work in the mine. Because, the troll is very greedy, he demanded that he be paid \$100 for his first day on the job and that he get a \$50 raise every day starting his second day. (On day 2, he would get \$150; \$200 on day 3, and so on.) What is the TOTAL amount of all his paychecks at the end of his 20<sup>th</sup> day of work?

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- 19) There are three tribes on an island. Members of the Liar Tribe always lie. Members of the Truthful Tribe always tell the truth. Members of the Alternator Tribe always alternate their statements: they tell one lie, then one true statement, then one lie, and so on. Which situation is impossible?
- A Liar says, "I am a Liar."
  - A Truthful says, "I am a Truthful."
  - An Alternator says, "I am a Liar."
  - A Liar says, "I am a Truthful."
  - An Alternator says, "I am an Alternator."

- 20) Grace starts at point S and walks at a steady pace once around the perimeter of a square park. Which graph best represents her distance (position) from S as time passes?

