Texas A&M University - Department of Mathematics
Math Fair Contest - April 20, 2013
Grades 3 - 4

Problem 1. What number should come next in the list 23, 19, 15, 11, ...?

Problem 2. What number should come next in the list 5, 4, 6, 3, 7, 2, 8, ...?

Problem 3. Calculate $6 + 7 - 8 + 9 - 10$.

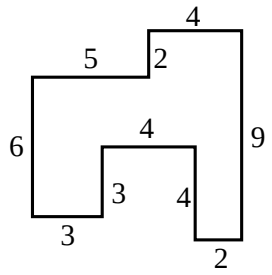
Problem 4. Calculate $6 \times 8 - 5 \times 7$.

Problem 5. Calculate $(45 - 9) \div 4$.

Problem 6. What is the largest possible number that is smaller than 4000 and can be written by using each of the digits 2, 3, 5, and 6 exactly once?

Problem 7. Imagine that you had six quarters, two dimes, and three nickels. If each sticker costs 30 cents, what is the largest number of stickers you could buy with your money?

Problem 8. A certain fenced yard has an irregular shape as in the following figure. What is the total length of the fence (the length of each fence side is indicated with a number)?



Problem 9. What is the area of the yard in the previous problem?

Problem 10. A square dancer is facing the music band all the time and he makes 5 steps to the right, 3 steps straight ahead, 7 steps to the left, and then 6 backwards. How many steps to the right and how many steps straight ahead does he need to make to get back where he started?

Problem 11. Jane wrote all numbers from 1 to 100 on the board. What is the total number of digits she used to write all those numbers?

Problem 12. What three digits should be used to replace the three stars in the following calculation

$$\begin{array}{cccc} & * & 2 & * \\ + & & 8 & * & 5 \\ \hline & 1 & 5 & 7 & 1 \end{array}$$

in order to obtain a correct calculation of a sum of two numbers.

Problem 13. Grandma Rachel has 3 large dogs and 4 small ones. Every day grandma gives 17 dog cookies to her dogs, and each large dog gets one cookie more than each small dog. How many cookies does each large dog get every day?

Problem 14. I have some number of chocolates, my sister has twice as many as I have, and our friend has twice as many chocolates as my sister does. Altogether the three of us have 21 chocolates. How many chocolates does my sister have?

Problem 15. Judy played soccer with her team every day during the last week. She scored 4 goals on Thursday, and she scored fewer than 4 goals on each of the other 6 days. What is the largest number of goals she could have scored during the last week?

Problem 16. Judy played soccer with her team every day during the last week. She scored 4 goals on Thursday, she scored fewer than 4 goals on each of the other 6 days, and she scored at least once every day. What is the smallest number of goals she could have scored during the last week?

Problem 17. Bob and Sheila started playing their drums by making a sound, each on his/her own drum at the same moment. After that Bob made a sound on his drum every two seconds, while Sheila made a sound on her own drum every 3 seconds. How many sounds of a drum did their mother hear in the first 15 seconds of their playing? Note that, when Bob and Sheila hit their drums at the same time their mother hears only one sound.

Problem 18. Sam likes to count. His yard has the shape of a rectangle. There is a fence post in each corner of the yard and there are a few more posts supporting the fence. Sam walked around one day and counted the posts. He noticed that there were 7 posts along the front side and 7 posts along the back side of the yard. He also noticed that there were 5 posts along each of the other two sides of the yard. How many posts are there altogether?

Problem 19. At some moment between 4 and 5 o'clock John looked at the clock and noticed that the large hand is exactly two minutes ahead of the small hand on the dial. What was the time at that moment?

Problem 20. The electricity went out and it is pitch-dark in your room (you cannot see anything). You are packing for a trip and you know that you have 6 white and 8 maroon socks in your drawer. What is the smallest number of socks you need to pack in your bag to make sure that you have packed at least one matching pair of socks?