

# Fresno Math Circle

## Preview Problems

5th grade

Name: \_\_\_\_\_

- Here are a few problems and puzzles that are similar to some of those we frequently do in our meetings. In addition, we work on our mental math skills, learn new math and various problem solving strategies, play various math games, and do fun group activities.
- Spend as much time as needed on these problems. Do not worry if you do not solve all of the problems. These problems are challenging. They are meant for you to see if you enjoy the problems we do at the Fresno Math Circle. However, please do try your best.
- For each problem, explain how you solved it (and show your calculations), and write your answer in the answer box. Please provide good and clear explanations in full sentences. We would like to see your reasoning, not just a correct answer.
- Have fun! If you enjoy solving problems and puzzles like these, you will definitely enjoy participating in the Fresno Math Circle.
- Parents: please scan your child's solutions and send them to [fresnomathcircle@gmail.com](mailto:fresnomathcircle@gmail.com) within one week of filling out the application form. Your child's work will be reviewed along with the application form.

1. Mrs. Winthrop went to a store, spent half of her money and then \$15 more. She went to a second store, spent half of her remaining money and then \$10 more. She then had no money left. How much money did she have to begin with when she went to the first store?

Answer:

2. Tom had a  $3 \text{ in} \times 3 \text{ in} \times 3 \text{ in}$  wooden cube. He painted five of the six sides red. Then he cut the cube into 27 pieces that are  $1 \text{ in} \times 1 \text{ in} \times 1 \text{ in}$ . How many of the small cubes have exactly two red sides?

Answer:

3. Rachael, Elaine, and Mark have a total of 58 stickers. Rachael and Elaine have a total of 34 stickers. Elaine and Mark have a total of 42 stickers. How many stickers does Elaine have?

Answer:

4. A rabbit loves cabbage and carrots. In a day, he eats 9 carrots, or 2 heads of cabbage, or 1 head of cabbage and 4 carrots. But some days he only eats grass. Over the last 10 days, he ate a total of 30 carrots and 9 heads of cabbage. On how many of these 10 days did he eat only grass?

Answer:

5. Let  $D$  be the sum of all odd numbers from 1 through 99 inclusive, and let  $N$  be the sum of all even numbers from 2 through 98 inclusive:

$$D = 1 + 3 + 5 + \cdots + 99,$$

$$N = 2 + 4 + 6 + \cdots + 98.$$

Which is greater,  $D$  or  $N$ ?

Answer:

6. In the addition problem below, each letter represents a digit, and different letters represent different digits. What digits do  $F$ ,  $N$ , and  $U$  represent?

$$\begin{array}{r} F \quad F \\ U \quad U \\ + \quad N \quad N \\ \hline F \quad U \quad N \end{array}$$

Answer:

7. This game is called Game 24. The goal is to make the quantity 24 using each of the following numbers exactly once and any operations and parentheses, in as many different ways as possible:

$$2, \quad 3, \quad 6, \quad 9.$$

For example, here is one way:  $(9 - 3 + 6) \times 2$ .

Can you think of a few other ways to make 24 using these numbers? List as many as you can find.