Fresno Math Circle

Preview Problems

6th grade

Name: _____

- Here are a few problems and puzzles that are similar to some of those we frequently do in our meetings. We also learn some advanced 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 and 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 within one week of filling out the application form. Your child's work will be reviewed along with the application form.

1. 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:

2. 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:

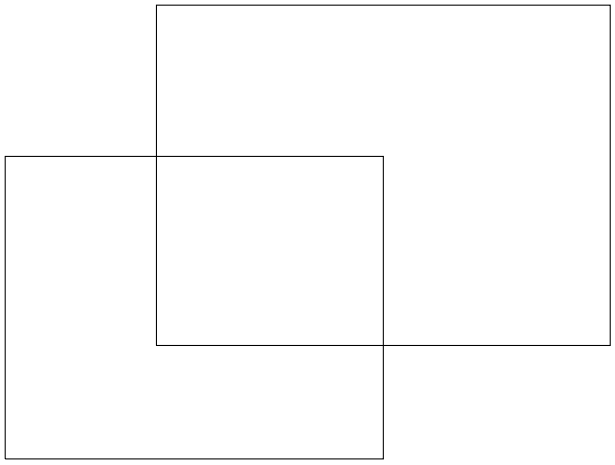
3. Let D be the sum of all odd numbers from 1 through 99 inclusive, and let N be the sum of all even numbers from 2 through 98 inclusive:

$$D = 1 + 3 + 5 + \cdots + 99,$$
$$N = 2 + 4 + 6 + \cdots + 98.$$

Which is greater, D or N?

Answer:

4. Two rectangles of dimensions 8×10 and 9×12 overlap as shown in the picture below. The total area covered by the rectangles is 150. What is the area of the overlap?



Answer:

5. If you multiplied thirty-five 9's together (i.e. $9 \times 9 \times 9 \times \cdots \times 9$, with thirty-five 9's), what would be the ones digit of the product?

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?

$$\begin{array}{cccc} & & F & F \\ & & U & U \\ + & & N & N \\ \hline & F & U & N \end{array}$$

Answer:

7. Fill in the grid so that each row and each column contains the numbers 1, 2, 3, 4, and 5 once each, and the product of the numbers in any bold-lined region is as indicated. Numbers may repeat within the bold-lined regions. For this puzzle you do not have to explain how you determined all entries, just fill in the grid.