Fresno Math Circle **2017**

Preview Problems

Grades 4-5 (in AY 2017-18)

Name: _____

- The first six problems are from a problem solving contest held as part of the Fresno Math Circle in May 2017. We frequently do problems like these in our meetings. In addition, we work on our mental math skills, play various math games, and do fun hands-on group activities.
- Spend as much time as needed on these problems. Do not worry if you do not solve all problems. These problems are very challenging. While a number of our participants solved a few of them, none solved all problems. These problems are meant for you to see if you enjoy the problems we do at the Fresno Math Circle.
- 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 no later than 1 week after the application date. 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 \$10 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. Someone put their pet bunny down on a correctly solved problem. What number did it cover up?

$193 \times 44 =$  $\times 193 + 2 \times 193$

Answer:

3. Suppose you have a 3 inch by 3 inch by 3 inch cube. You paint the outside red, except the bottom and one of the sides. Then you cut the cubes into 27 pieces that are 1 inch by 1 inch by 1 inch. How many of the small cubes have exactly 2 red sides?

Answer:

4. Patricia has \$12 more than Rhoda and \$15 more than Sarah. Together, all three have \$87. How much does Patricia have?

Answer:

5. The weight of a whole brick is the same as 4 pounds plus the weight of 1/3 of the whole brick. How many pounds does the whole brick weigh?

Answer:

6. In the addition problem below, there are three two digit numbers in which different letters represent different digits. What digits do A, B, and C represent?

$$\begin{array}{cccc} & & A & A \\ & & B & B \\ + & & C & C \\ \hline & A & B & C \end{array}$$

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:

$$2, \qquad 3, \qquad 4, \qquad 6.$$

For example, here is one way: $6 \times 3 + 2 + 4$.

Can you think of a few other ways to make 24 using these numbers?