Junior Circle 1, Problem Set 26

1. Minnie the Mouse is 8 years older than Riti the Rat. Two years ago, Minnie was three times as old as Riti. How old is Minnie?

2. Andy makes a deal with his mom: If Andy keeps his room clean for 30 days, his mom promises to give him $9 and a chocolate bar. After 3 days, Andy quits and gets the chocolate bar only. How much does the bar cost?

3. Fifteen tulips and 15 daffodils grow along the trail connecting Jack and Jill's houses.

Jill starts at her house along the trail and waters all the flowers on her way. She runs out of water right after the **10th tulip**. 10 remaining flowers along the trail are not watered.

Next day, Jack starts from his house toward Jill's. He picks up every flower on his way. When he has 6 tulips, he stops. How many flowers are left along the trail?

4. A half of a watermelon, and a quarter of this watermelon, and an eights of this watermelon, and a 1-pound-weight together weigh like one watermelon. What is the weight of a watermelon?

5. Four towns are shown as dots on the picture.

An engineer wants to design a railroad system that connects all four towns so that:
- It starts and ends at the same place;
- It consists of exactly 3 straight segments connected to each other: the end of one segment is the beginning of the other.

Can you help the engineer with the design? Draw the railroad

6. After the engineer successfully completed problem 4, he was invited to work on even more challenging task:

Design a railroad system that connects all 9 towns so that:
- The system is a chain of 4 straight segments.
- The end of one segment is the beginning of another.
- You should be able to travel entire railroad system in one journey, without going over the same road twice
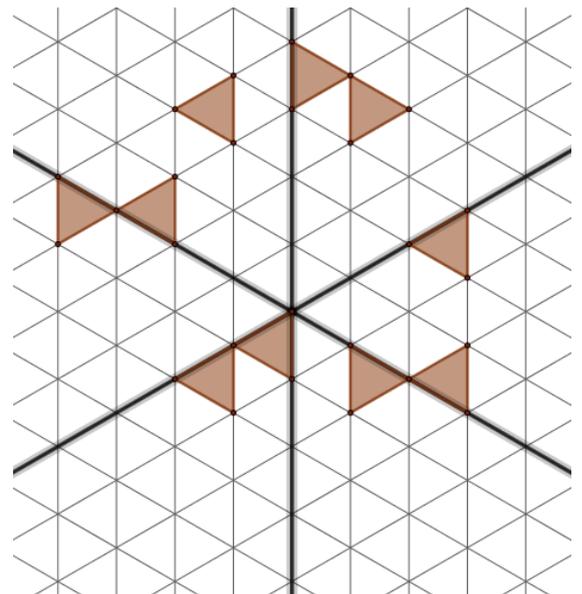- The start and the finish could be in different towns.
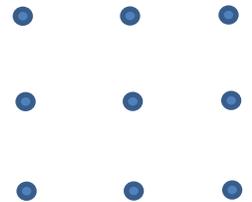
Can you help the engineer draw the railroad?

7. Complete the picture to give it rotational symmetry of degree 6.
Does your picture have line symmetry?
How many symmetry lines can you draw?

8. Biner the Robot keeps learning column addition and subtraction. Biner only understands binary numbers. Can you help him to add and subtract the numbers below?

(When you add 1+1 in binary, you get 10. Write 0 and carry the 1 over.

To subtract, you might need to borrow.)

$$\begin{array}{r} 1\ 1\ 0\ 1\ 1 \\ -\quad\ \ 1\ 1\ 1\ 1 \\ \hline \end{array} \qquad \begin{array}{r} 1\ 1\ 0\ 1\ 1 \\ +\ 1\ 0\ 1\ 0\ 1 \\ \hline \end{array}$$

Challenge

9. Six girls and 3 boys came to school. Together, these kids had 24 pencils. All the girls had the same number of pencils, and all the boys had the same number of pencils. Four girls set at one table, and everyone else set at another. It turned out that each table has the same number of pencils. How many pencils each boy had?

10. Three different nations live in the Magical Land: elves, gnomes, and orcs. An orc would always lie, an elf would always tell the truth, and a gnome would sometimes choose to lie, sometimes choose to tell the truth? Once upon the time, 12 inhabitants of the Land got together for a meeting. Each of them said "There are 6 elves at our meeting". How many of the participants were elves, if exactly 2 orc came for this meeting?