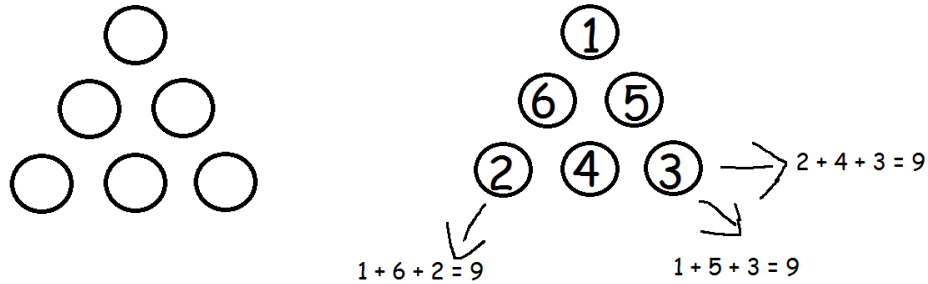


Chapel Hill Math Circle
Beginners Group (1-3)
January 23, 2016

1. Recall last week's warm up problem. We wanted to use the numbers 1 to 6, without repetition, and place them in the circles below so that the sum of each side of the shape would be equal. For example,



We found that there were other ways of doing it that added up to 10, 11, and 12. (Do you remember how?) However, we could not make it add up to either 8 or 13. Why is that?

2. A very special island is inhabited only by knights and knaves. Knights always tell the truth and knaves always lie. You meet two inhabitants and they make certain statements. Can you determine what they are?

Abe: Bob is a knave.

Bob: Abe and I are knights.

3. If there are 5 pigeons who want to have a home (let's call it a pigeonhole), but there are only 4 holes. What can you say about the way they can choose the holes if every pigeon would like its own pigeonhole? Can they do it?
4. Last week we met the tetrominoes. (Do you remember what those are and how many different ones there are?) Suppose each square in the tetrominoes can cover exactly one square from a special 4x5 chess board. Can you cover the board with tetrominoes?