

Chapel Hill Math Circle
Intermediate Group (6-7)
January 16, 2016

1. Zator always tells the truth on Mondays, Thursdays, and Saturdays, but lies on every other day. If he makes the statement, "I will tell the truth tomorrow," what day of the week is it?
2. Consider 3 squares of the same size. We want to create shapes with them so that each square is completely touching at least one other square along an entire edge. How many different shapes can you make?
3. Consider 4 squares of the same size. We want to create shapes with them so that each square is completely touching at least one other square along an entire edge. How many different shapes can you make? (These are the tetrominoes!)
4. Can you cover a 4×5 board with all the tetrominoes? A 10×2 ? A 20×1 ? For each of these cases, show a way to cover the board or explain why it cannot be done.
5. IF TIME: Consider dominoes that can cover exactly two squares of a chess board. How many do you need to cover the board? Now cut out two opposite corners from the board. Can you cover it with 31 dominoes? If you can, show a way to do it; if you can't, explain why.