

UW Math Circle
April 14, 2016

1. Show that $1 + 3 + 5 + \cdots + (2n - 1) = n^2$.

2. We did this problem a few weeks ago:

Suppose that a graph has n vertices, and that there is an edge between every pair of distinct vertices. How many edges are in the graph?

We found the answer was $n(n - 1)/2$ using different methods, but now see if you can prove that this is the correct answer using induction.

3. Into how many regions do n straight lines divide a plane, if no two of them are parallel and no three of them meet at a single point?

4. Find a formula for the number of ways to cover a $2 \times n$ chessboard with dominoes (so that each square is covered, and no dominoes overlap). Prove your formula is correct.

