Problem 1: Parity of the Last Number

For an odd integer n, Lila writes the numbers $1, 2, 3, \ldots, 2n$ on the board. Then she picks any two of the numbers a, b in the list, erases them and adds the number $|a-b|$ to the list. She keeps doing this until a single number remains in the list. What will be the parity of that number? Can we tell? You must prove your answer.

As always, show your work, fully explain and justify your answer.

Posting Date 1/15/2017. Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 1/26/17.