**Title:**

*Counting Lattice Paths having Step Sizes of {-2, -1, 1, 2} from j to k, where j, k are Natural Numbers and the Path Never Touches nor Goes Below the x-axis*

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**Abstract:**

We seek an explicit formula to count the number of good lattice paths, G($n$, $j$, $k$), that travel from $j$ to $k$ in $n$-steps where $j$ and $k$ are natural numbers and {-2, -1, 1, 2} is the set of allowable step sizes. A Good path is defined to be lattice path that travels from $j$ to $k$ in $n$-allowable steps while never touching nor going below the x-axis along the way. We present two alternative approaches:

- A recursive formula that that produces a formula for G($n$, $j$, $k$) by counting bad lattice paths. This makes key use of interesting but unestablished formula for G($n$, 0, 1) and G($n$, 0, 2).

- *The impressive kernal method as described in Cyril Banderier, Philippe Flajolet. Basic analytic combinatorics of directed lattice paths. Theoretical Computer Science 281, Issue 1-2 (2002), 37-80. This produces the generating function whose coefficients are G(n, j, k).*

Connections and pro's and con's of the preceding results of each method are discussed.