

On bounce-free rational lattice paths

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In this preliminary report we examine lattice paths from $(0, 0)$ to $(\alpha k, \beta k)$ made from only North and East steps, with $(\alpha, \beta) = 1$. We give generating functions (in terms of known objects) for the number of bounce-free paths (i.e. paths that do not “bounce” off of the line $y = \frac{\beta}{\alpha}x$), and discuss how this leads to enumerating paths which bounce exactly ℓ times to the left and r times to the right.

This is joint work with Daniel Birmajer and Juan B. Gil.

Keywords: rational lattice paths, bounce-free paths.