Index of a Farey sequence

[Award] **8 pts**

[Category] **Math**

Let *Fidx*(*n*, *k*) denote the *k*-th term in the Farey sequence of order *n*. For example, the Farey sequence of order 5 is {0/1, 1/5, 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 1/1}, and the 7th term is 3/5, so *Fidx*(5, 7) = 3/5. You are also given *Fidx*(12, 31) = 7/11, *Fidx*(123, 3141) = 82/121.

Find Fidx(1234567890, 314159265358979323). The answer should be represented as an irreducible fraction.

Thanks to **czp** for the idea.

[Answer] **160453095/236619041**