Two exercises for next time (8/2/2021)

1. Compute a telescoper for the diagonal of the rational power series

$$\frac{1}{1-x-y} = \sum_{i,j\geq 0} \binom{i+j}{i} x^i y^j$$

in two different ways:

   1. using the 2G (Almkvist-Zeilberger) creative telescoping algorithm;
   2. using the 4G (Hermite reduction-based) creative telescoping algorithm.

2. Let $f, g \in \mathbb{Q}[x]$ be two coprime polynomials. Let $h \in \mathbb{Q}[x]$ be another polynomial such that $\deg h < \deg f + \deg g$.

   1. Show that the equation
   $$sf + tg = h$$
   admits an unique solution $(s,t) \in \mathbb{Q}[x]^2$ s.t. $\deg s < \deg g, \quad \deg t < \deg f$.
   2. Design an algorithm for computing the solution (s,t) starting from (f,g,h) in quasi-optimal complexity.