Two exercises for next time (6/2/2020)

1. Compute a telescopser 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

\[
s f + t g = h
\]

admits an unique solution \((s, t) \in \mathbb{Q}[x]^2\) s.t. \( \deg s < \deg g, \ \deg t < \deg f \).

2. Design an algorithm for computing the solution \((s, t)\) starting from \((f, g, h)\) in quasi-optimal complexity.