

**Exercise 1** (Exercise 7, Stanley 7.3). Expand the power series  $\prod_{i \geq 1} (1 + x_i + x_i^2)$  in terms of elementary symmetric functions.

**Answer**

Let us begin by considering smaller cases:

◇ When there's only two factors we have

$$(1 + x + x^2)(1 + y + y^2) = x^2y^2 + x^2y + x^2 + xy^2 + xy + x + y^2 + y + 1$$