Algebraic Methods in Kinematics Homework 4

Let $a_1, a_2, a_3, b_1, b_2, b_3 \in \mathbb{Z}$. Compute the mapping degree (= cardinality of the preimage of a generic point) of the map

$$(\mathbb{C}^*)^2 \to \mathbb{P}^2, \ (x,y) \mapsto (x^{a_1}y^{b_1} : x^{a_2}y^{b_2} : x^{a_3}y^{b_3}).$$

Remark: Using the BKK formula is maybe the fastest approach. However, the map is simple enough so that the preimages can be explicitly computed and then counted.