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*Hilbert functions of schemes of double and reduced points*

Given a valid Hilbert function  $H$  of a zero-dimensional scheme in  $\mathbb{P}^2$ , we show how to construct a set of fat points  $Z \subset \mathbb{P}^2$  of double and reduced points such that  $H_Z$ , the Hilbert function of  $Z$ , is the same as  $H$ . In other words, we show that any valid Hilbert function  $H$  of a zero-dimensional scheme is the Hilbert function of some set of double and reduced points.