

# Defining ideals of monomial curves in $\mathbb{A}^4(K)$

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**Abstract** We give a new classification of monomial curves in the affine 4-dimensional space  $\mathbb{A}^4(K)$ . It relies on the detection of those binomials and monomials that have to appear in every system of binomial generators of the defining ideal of the monomial curve; these special binomials and monomials are called indispensable in the literature. This way to proceed has the advantage of producing a natural necessary and sufficient condition for the defining ideal of a monomial curve in  $\mathbb{A}^4(K)$  to have a unique minimal system of binomial generators.

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