Algebraic Geometry

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Basic questions

A *curve* $\mathcal{C}$ in the affine plane $\mathbf{A}^2(K)$ over the field K is the set of zeros (x, y) of a polynomial $f(X, Y)$. This is better viewed as a curve $\mathcal{C}'$ in the projective plane $\mathbf{P}^2(K)$ as the set of zeros (x, y, z) of a homogeneous polynomial $F(X, Y, Z)$.

What is a *singular* point of $\mathcal{C}'$?

What is an *inflexion* of $\mathcal{C}'$?

What is the *genus* of $\mathcal{C}'$?

In how many points do two such curves intersect?