## Bézier Form of Conic Sections

Any rational quadratic Bézier curve parametrized by

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r=\frac{\left(c_{0} w_{0}\right) b_{0}^{2}+\left(c_{1} w_{1}\right) b_{1}^{2}+\left(c_{2} w_{2}\right) b_{2}^{2}}{w_{0} b_{0}^{2}+w_{1} b_{1}^{2}+w_{2} b_{2}^{2}}
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represents a segment of a conic section.
Conversely, any nondegenerate conic section can be represented by an extended parametrization $r(t), t \in \mathbb{R} \cup\{\infty\}$.


As is indicated in the figure, if the control points are not collinear, the type of the rational quadratic Bézier curve corresponds to the sign of $d=w_{0} w_{2}-w_{1}^{2}$.

