

Building Basic, Intermediate and Advanced Plots with Matplotlib



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Overview

Plot complex shapes, polygon and Bezier curves

Text annotations on graphs to convey information

Different units on the same axis using twin axis

Different scales on each axis

Demo

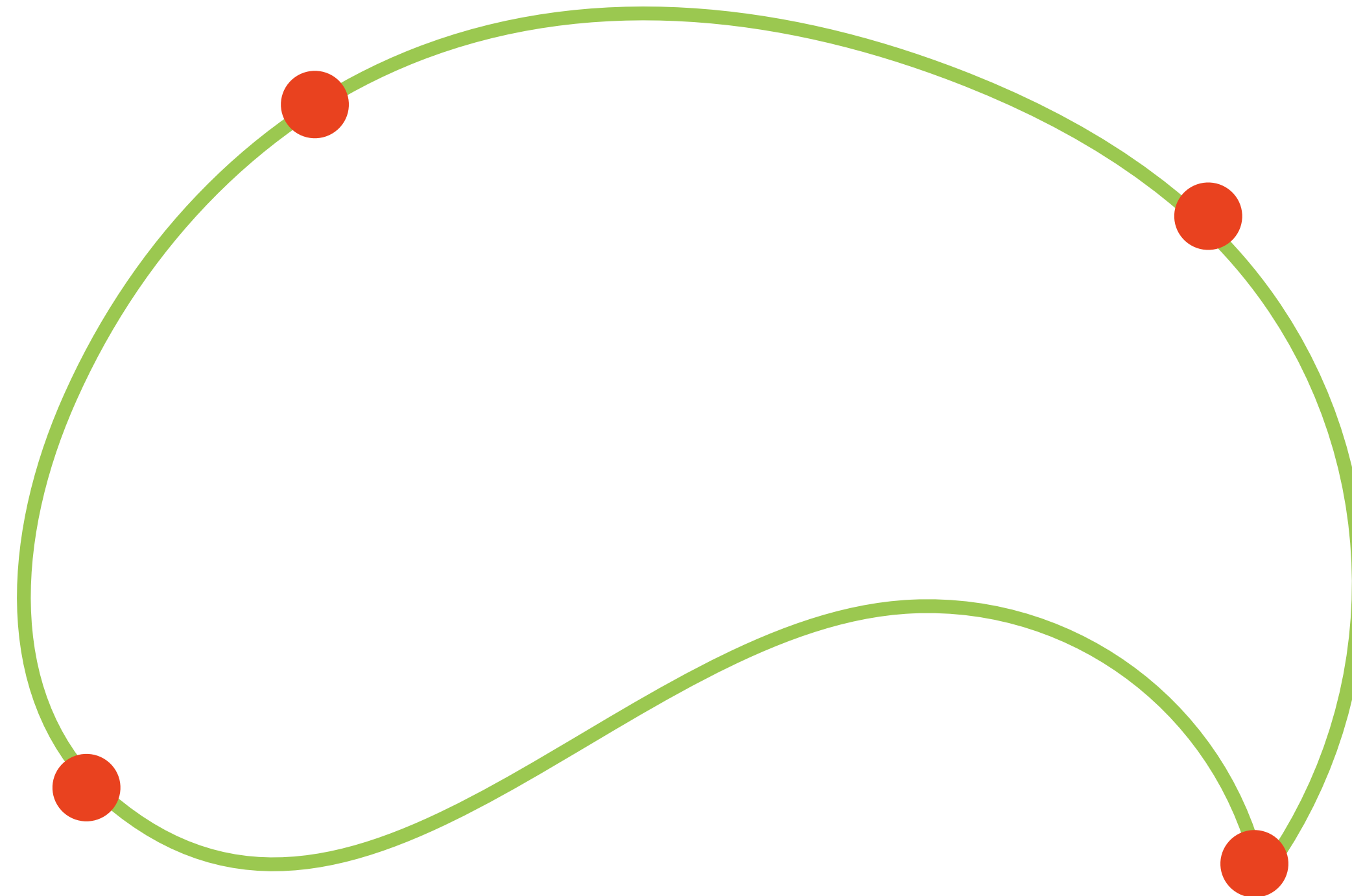
**Drawing shapes with the patches
module**

Bezier Curve

Bezier Curve

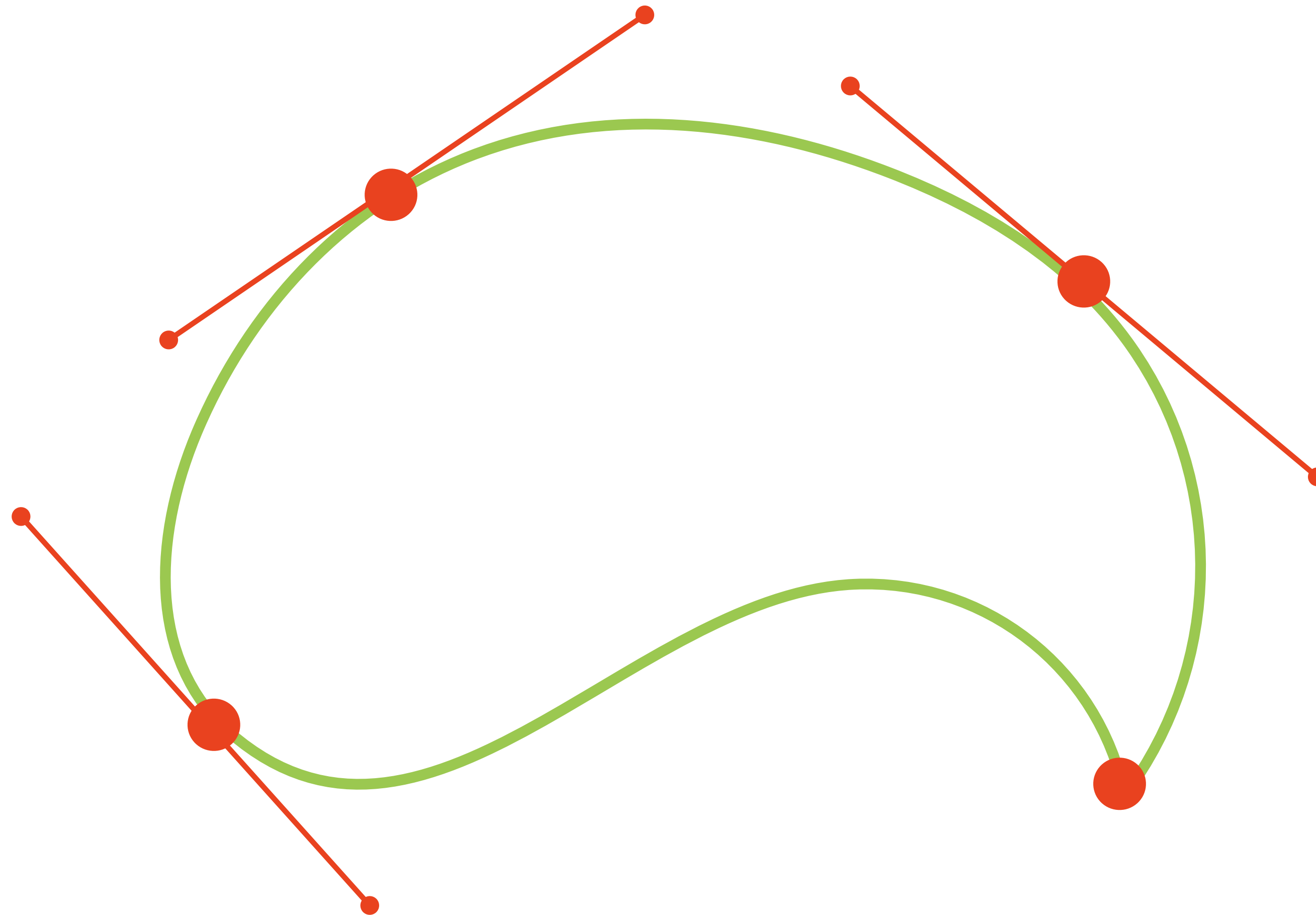


Bezier Curve



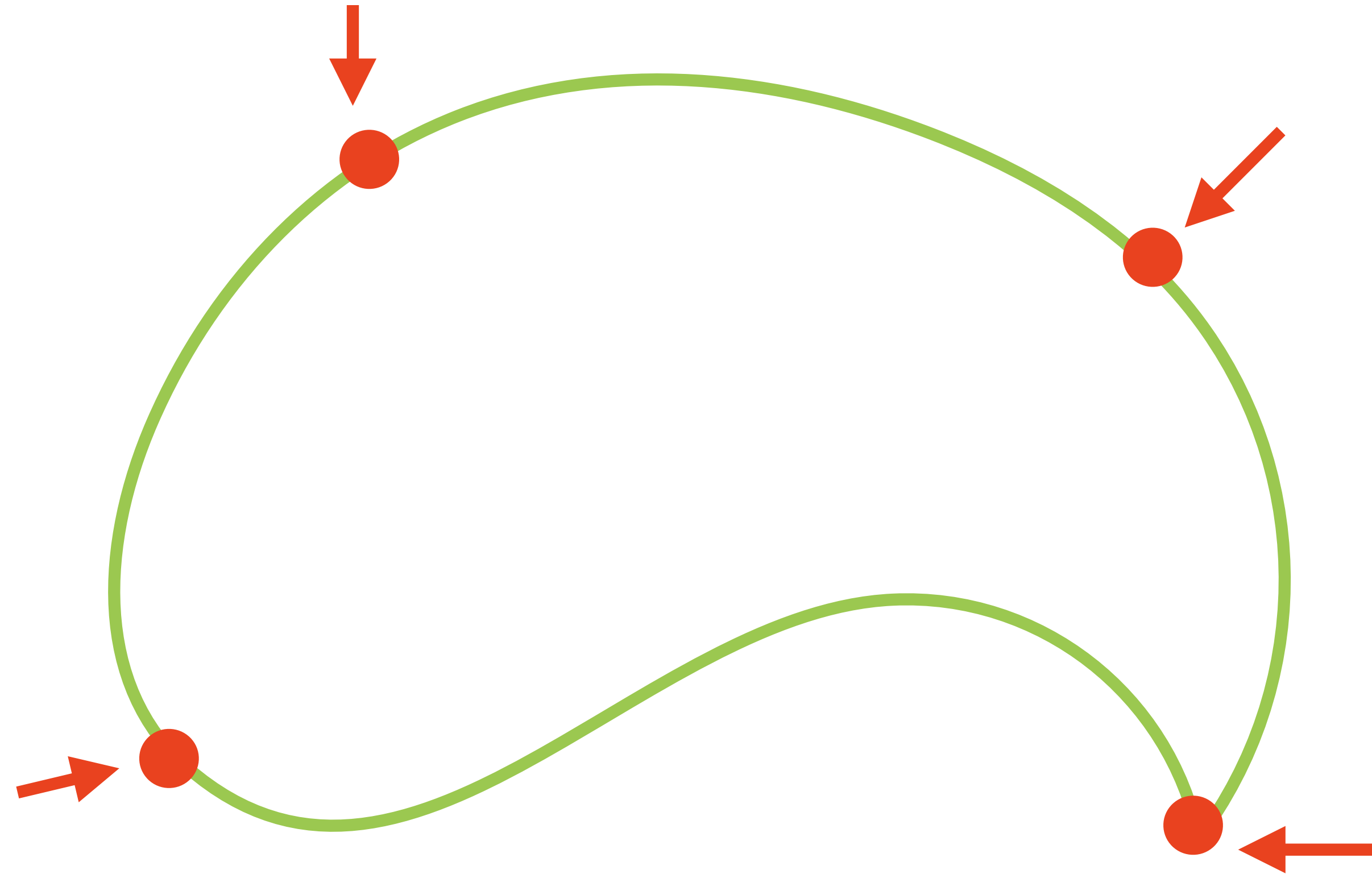
Vector shapes are made up of series of points

Bezier Curve



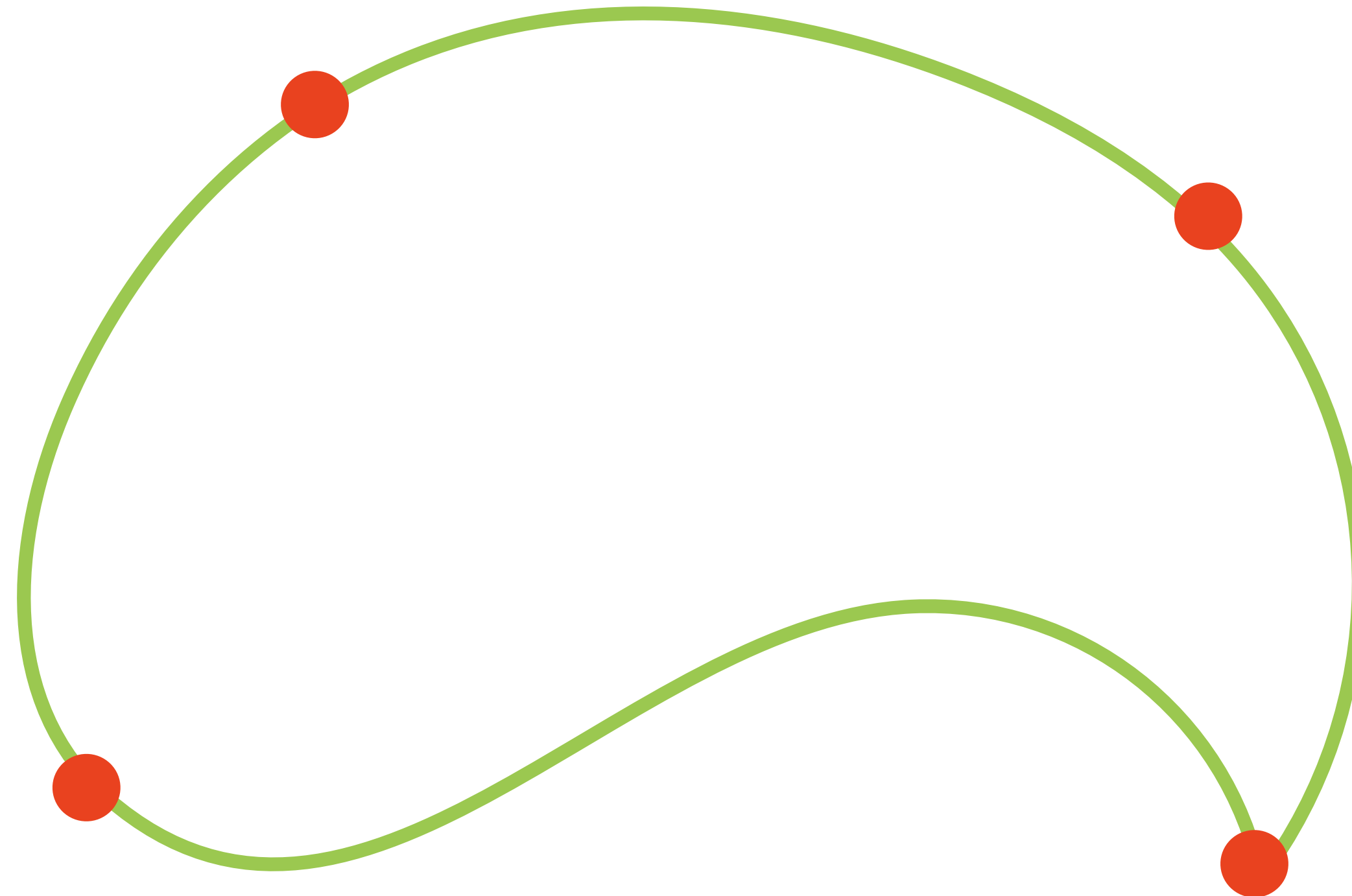
Some of these points cause the shape to curve

Bezier Curve



A bezier curve is defined by control points

Bezier Curve



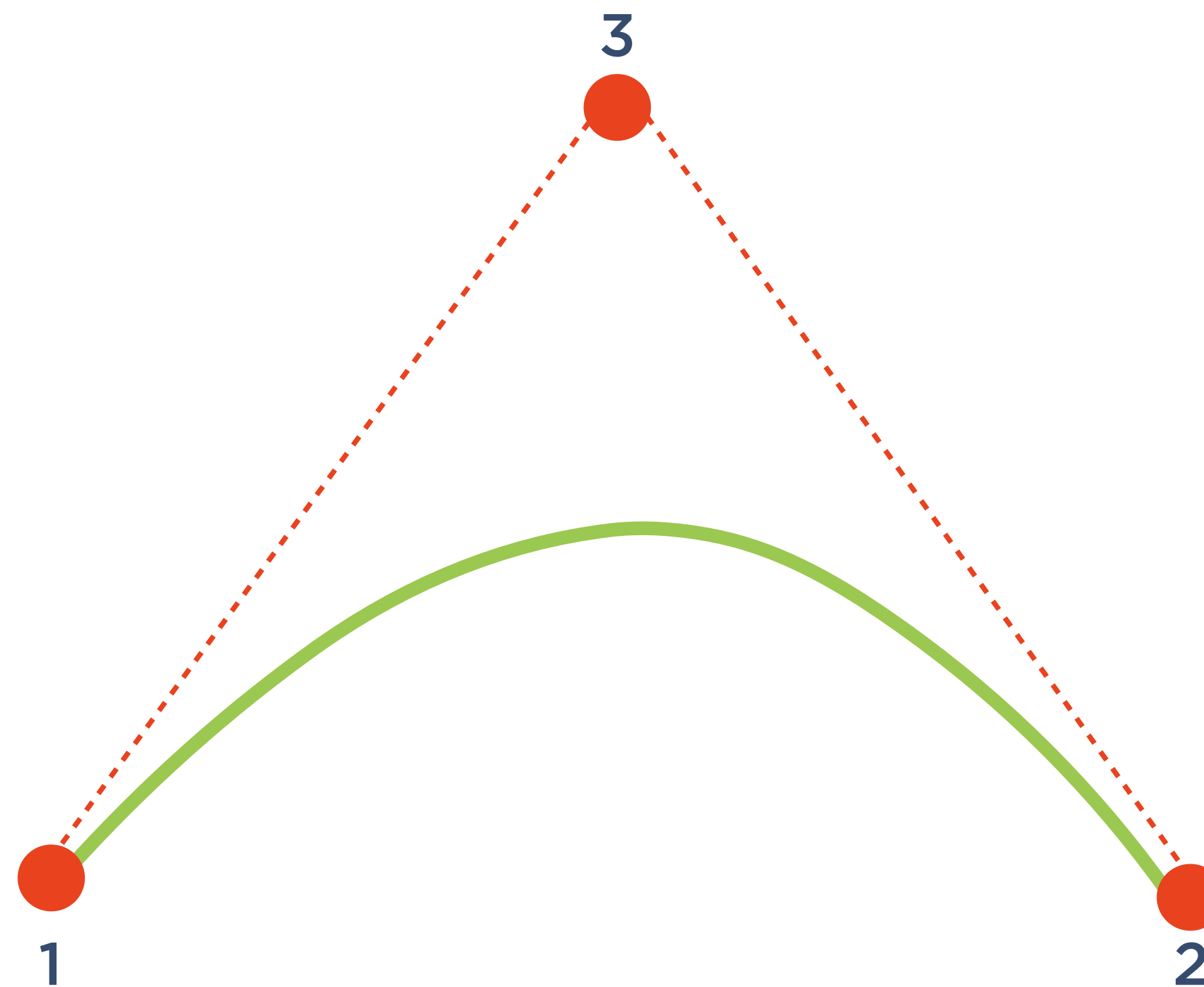
Number of control points varies as per type of curve

Bezier Curve



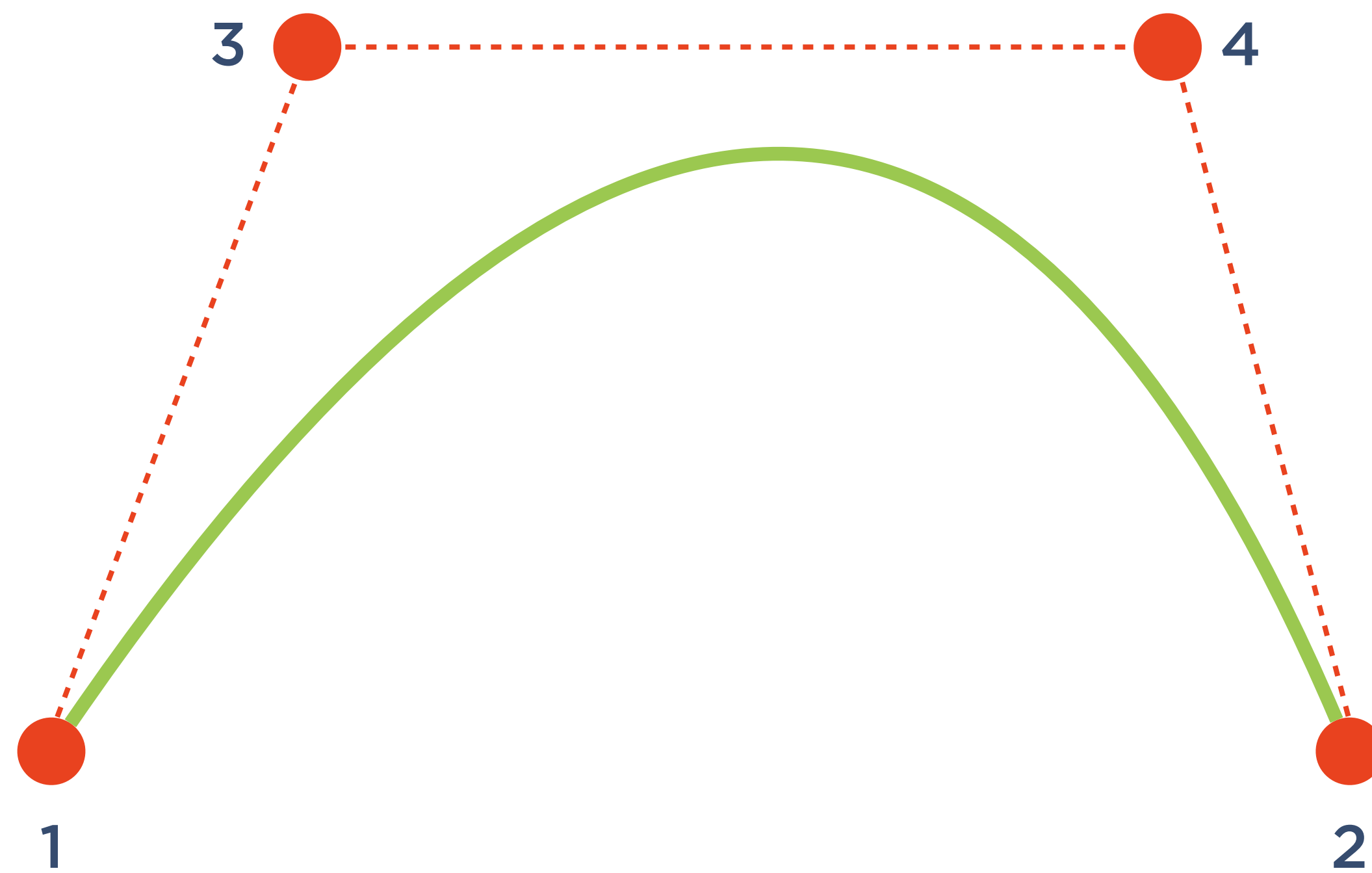
Linear curve

Bezier Curve



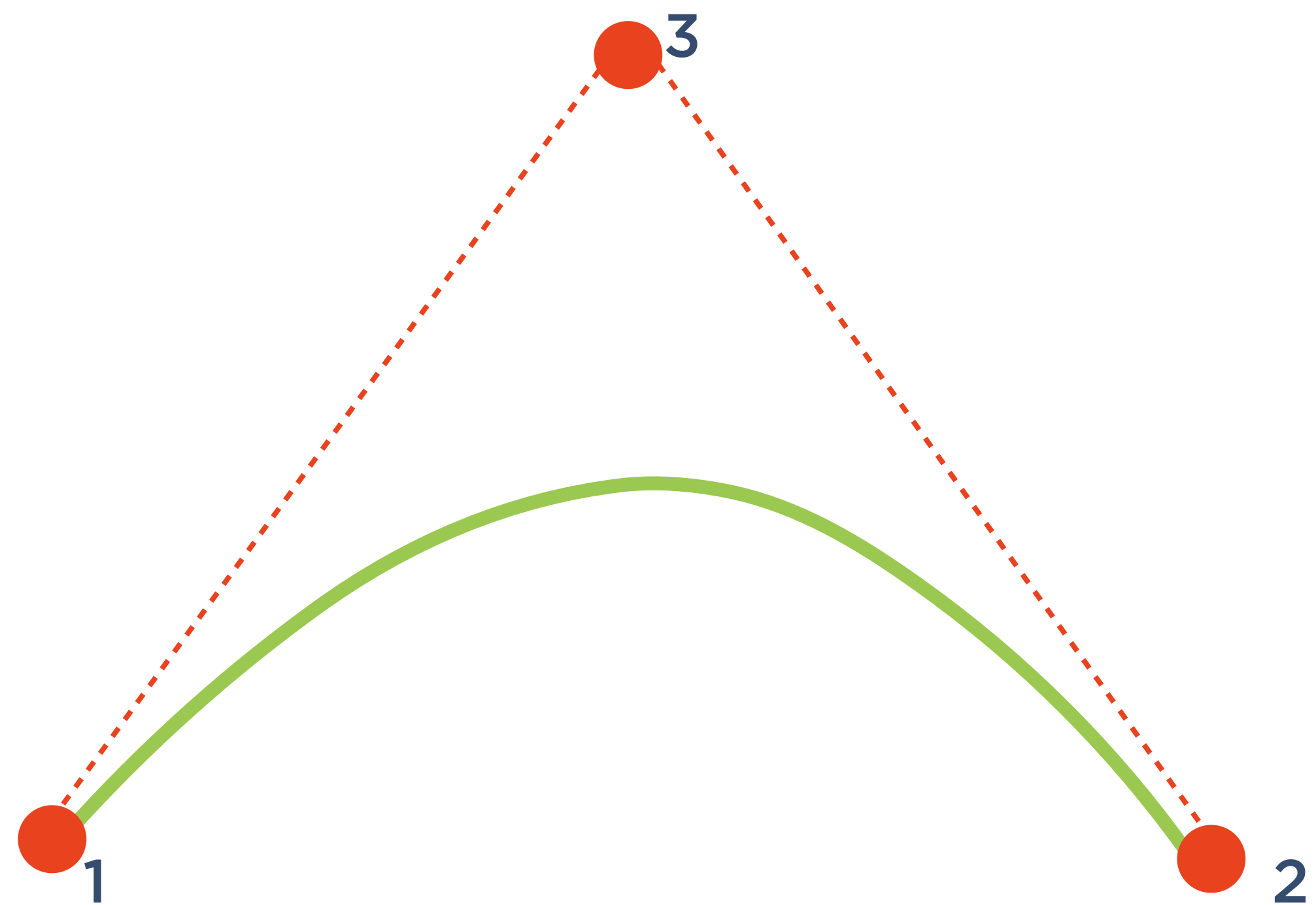
Quadratic curve

Bezier Curve



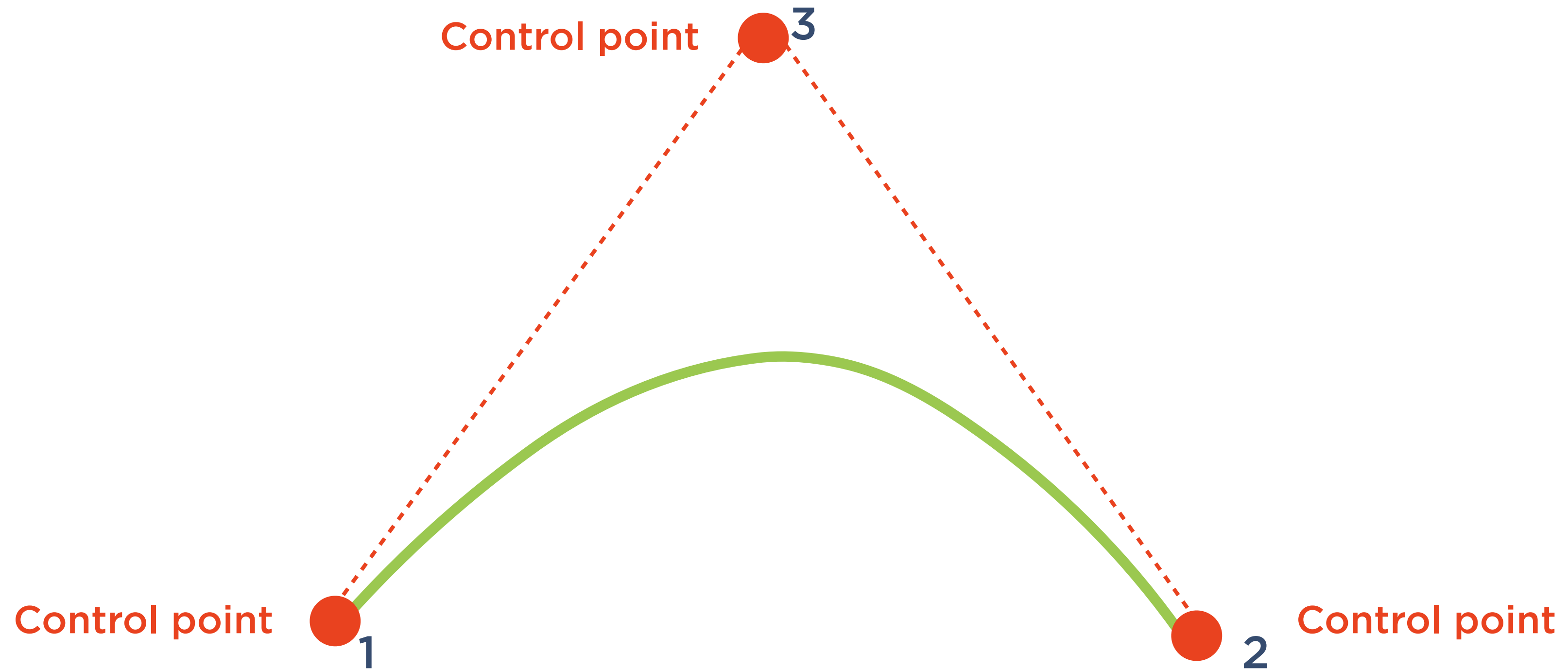
Cubic curve

Bezier Curve



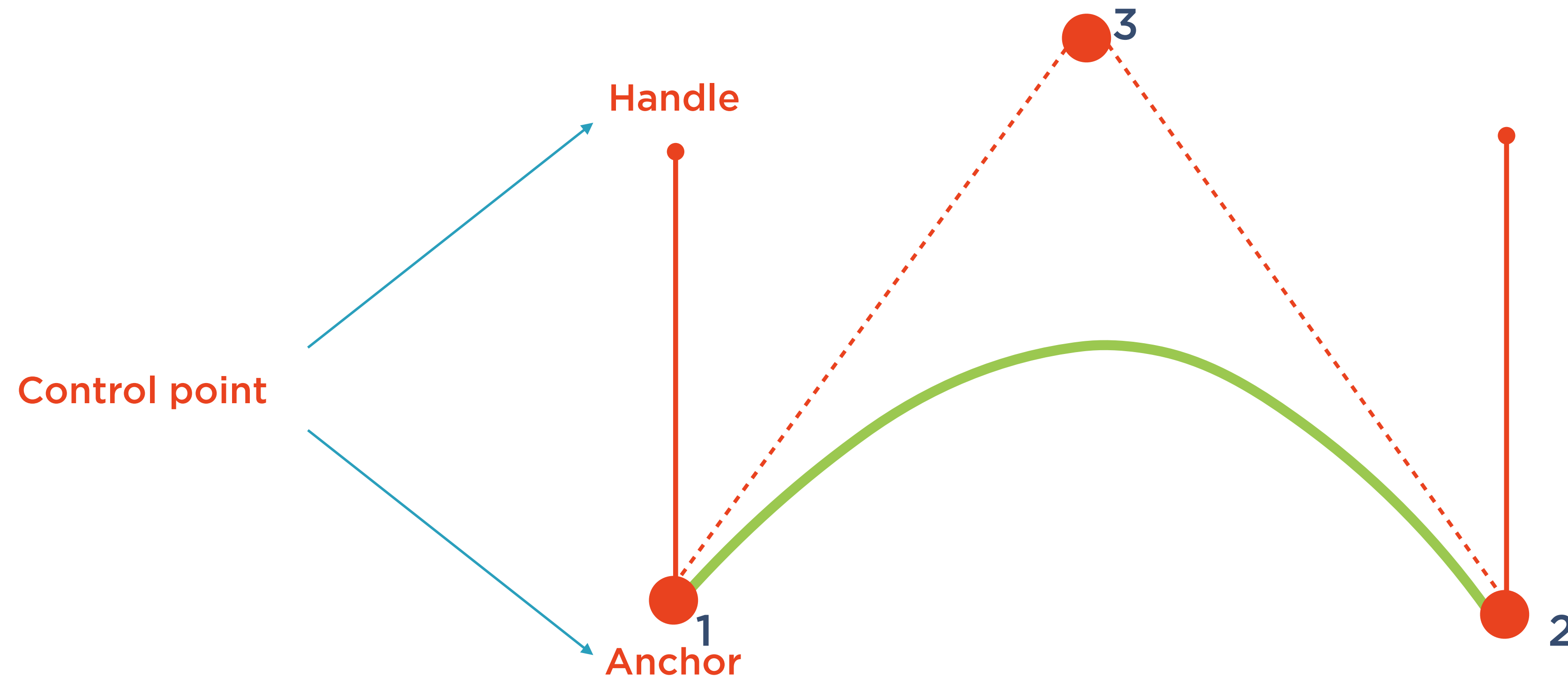
Control polygon

Bezier Curve



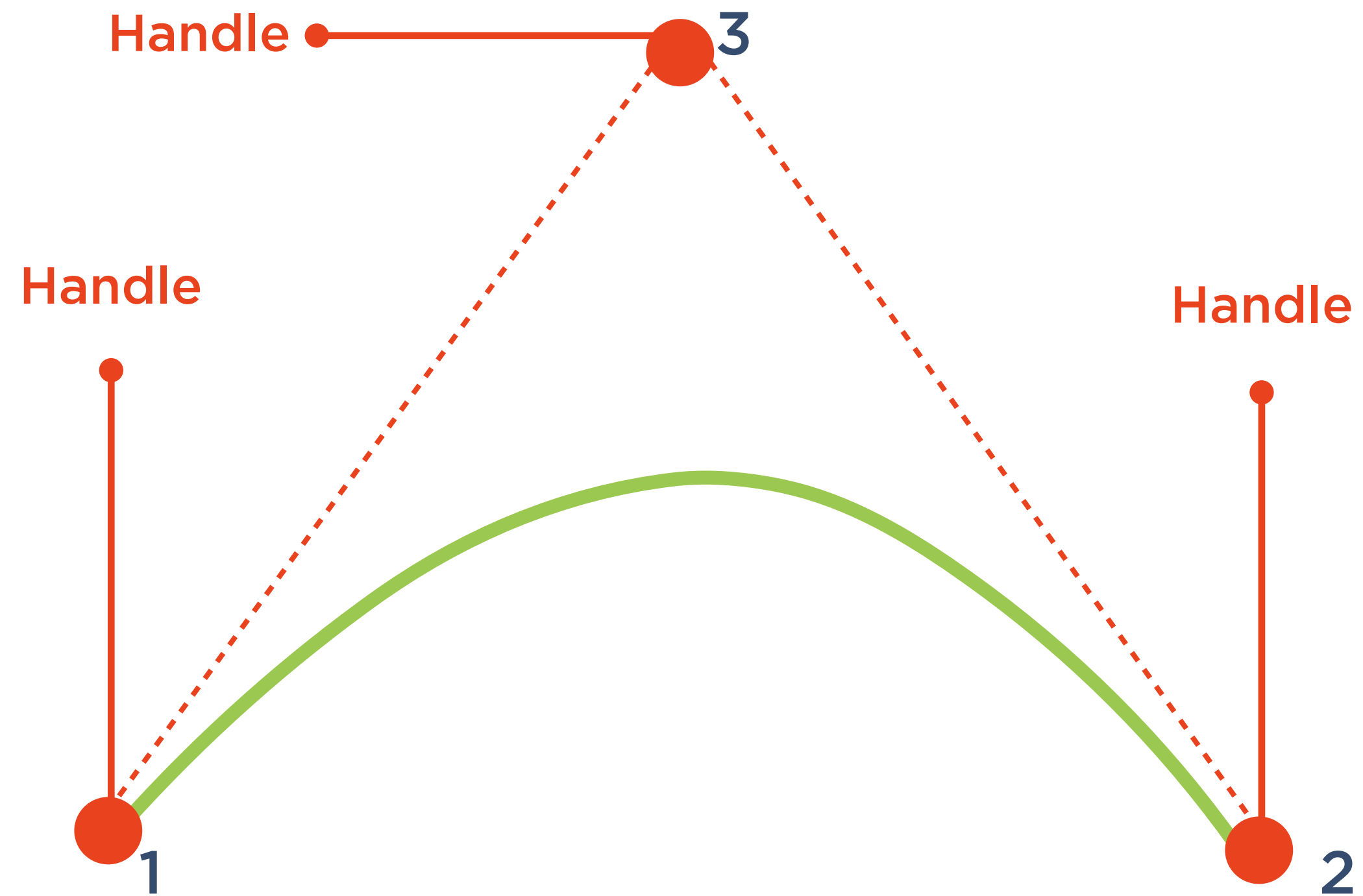
Term control point is used for all the positions of the Bezier curve

Bezier Curve



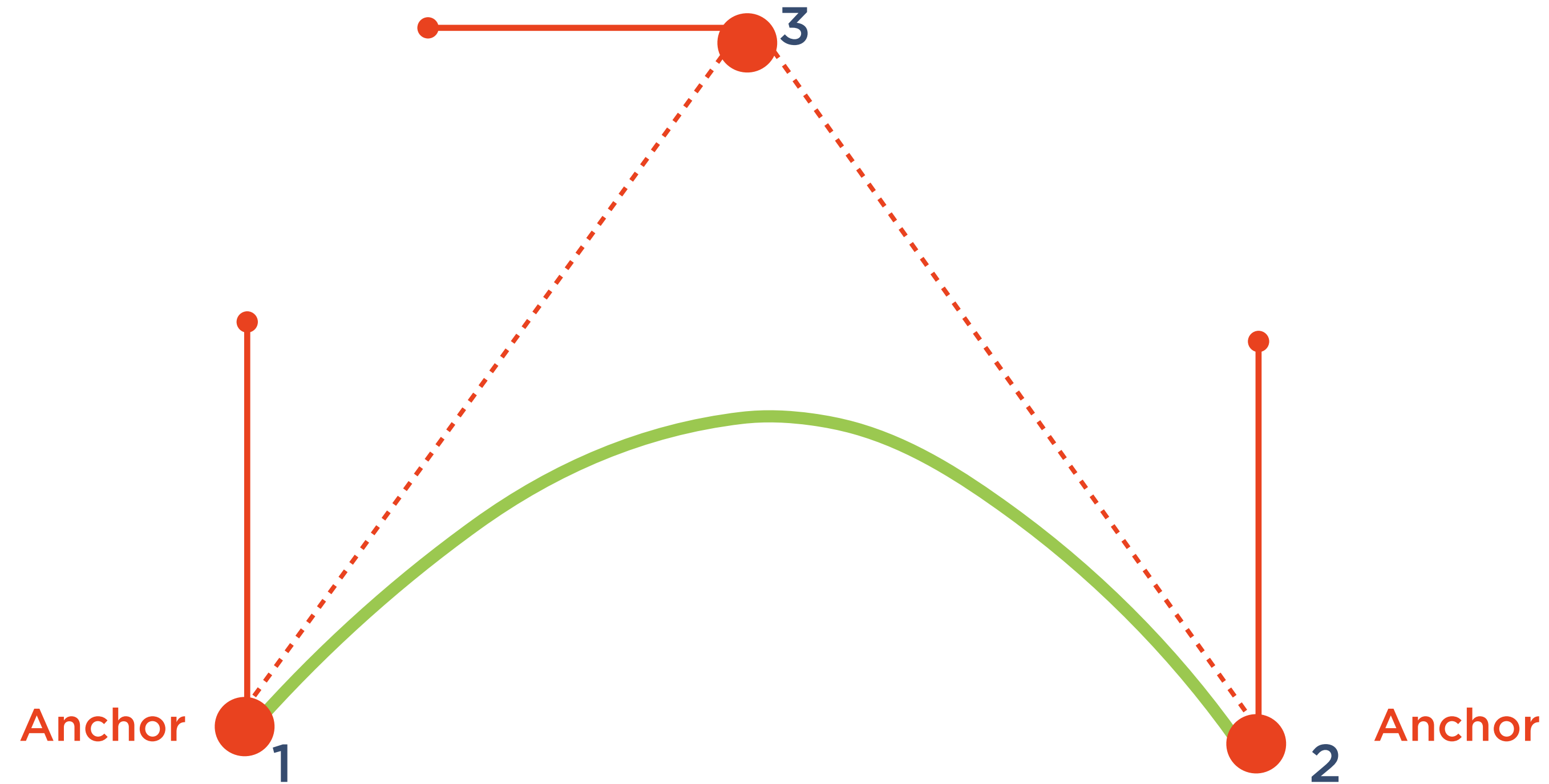
Control point is made up of handles and anchors

Bezier Curve



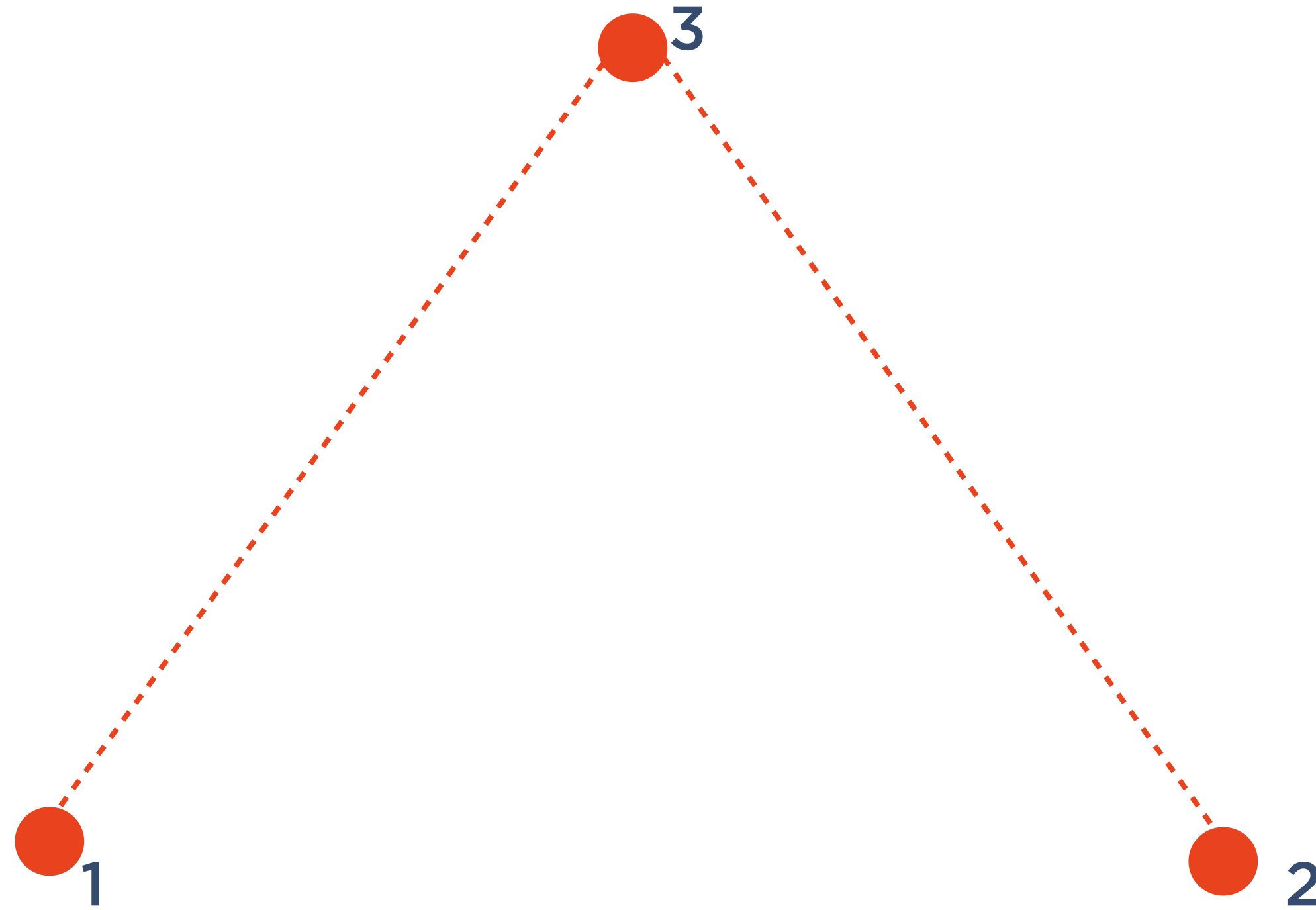
Positions used to influence the curvature
are called **handles**

Bezier Curve



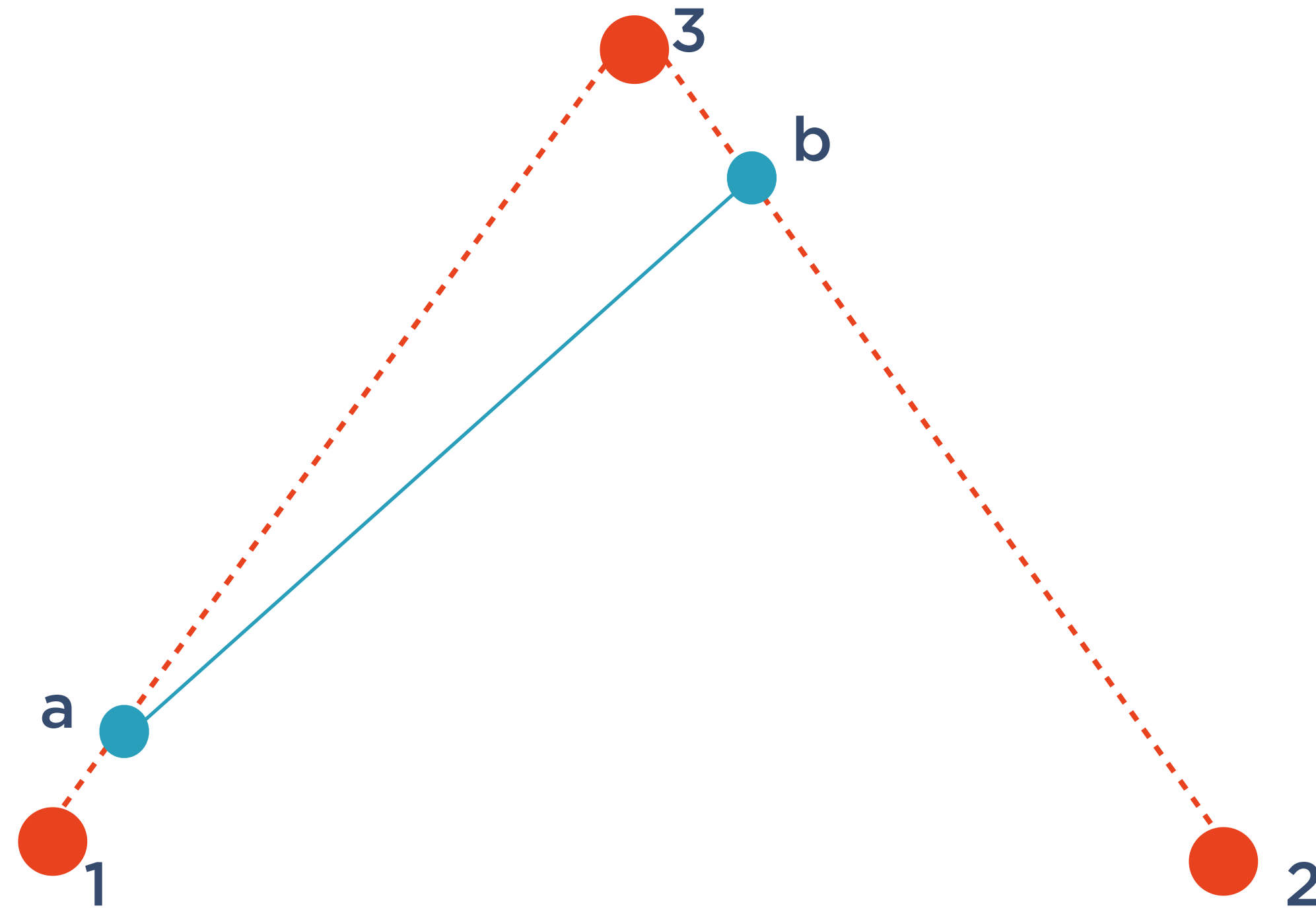
Anchors describe the start and end position of the curve

Bezier Curve



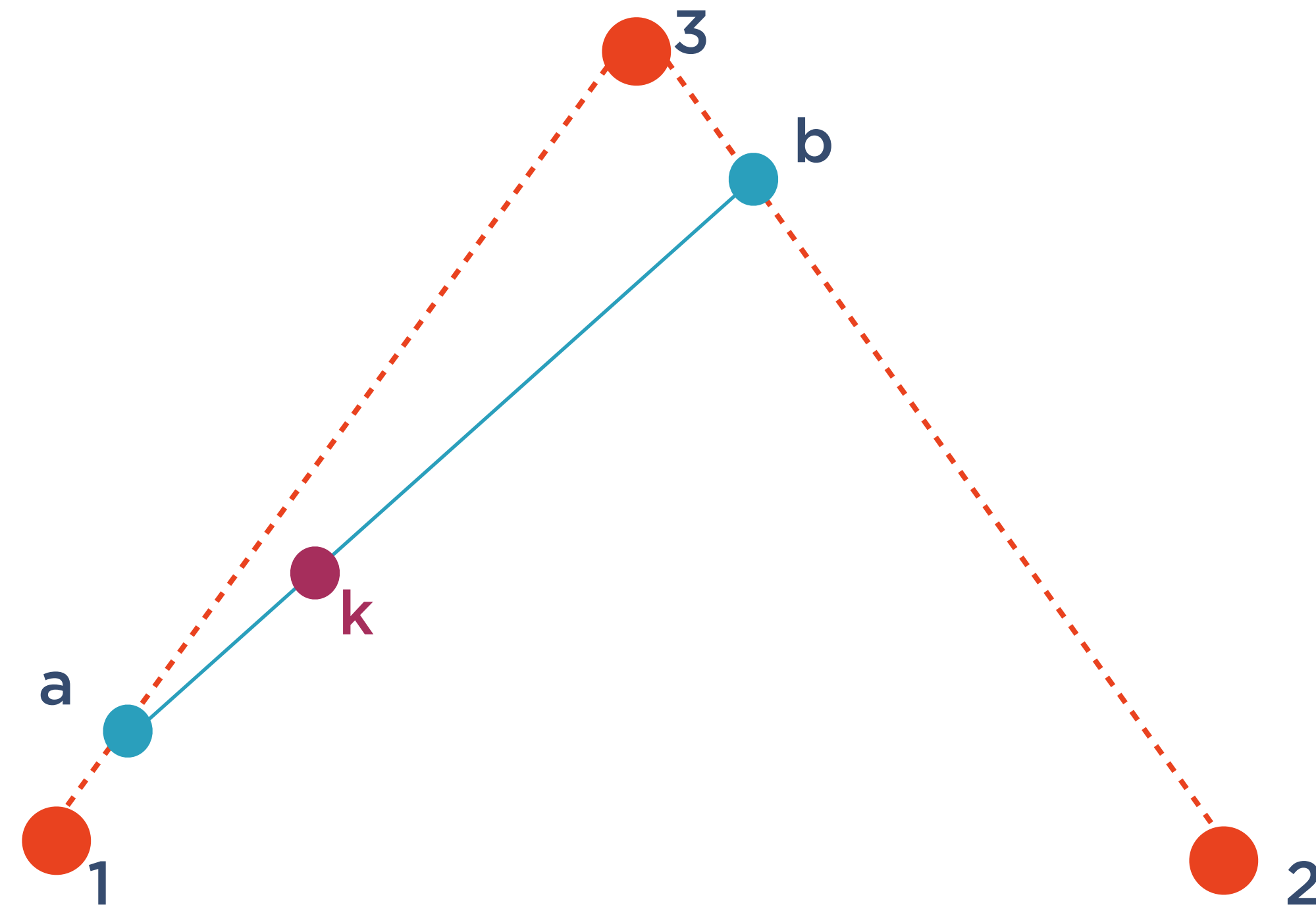
Interpolate along each leg of the polygon

Bezier Curve



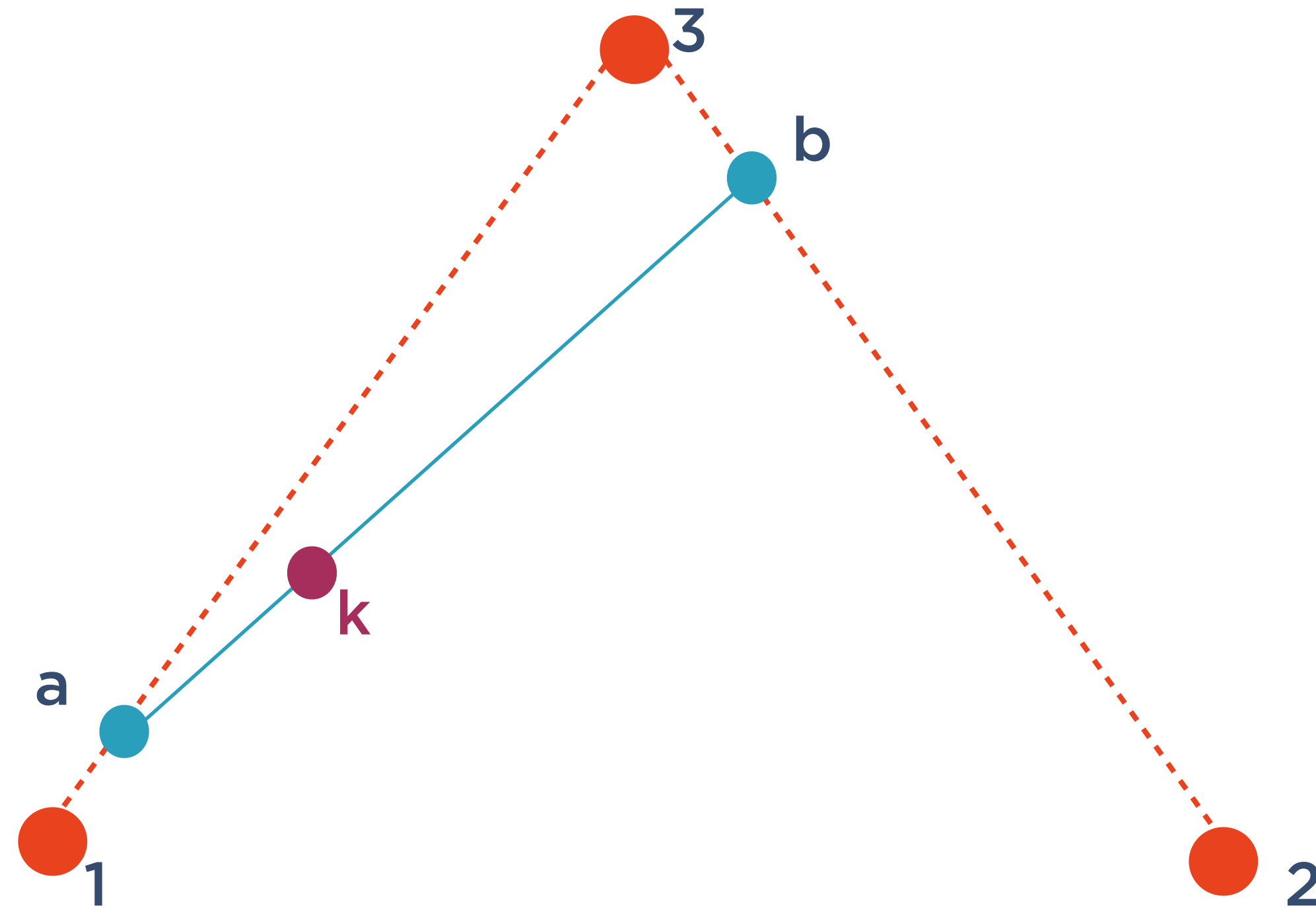
Draw a line between points a and b

Bezier Curve



k is the point that will define curve

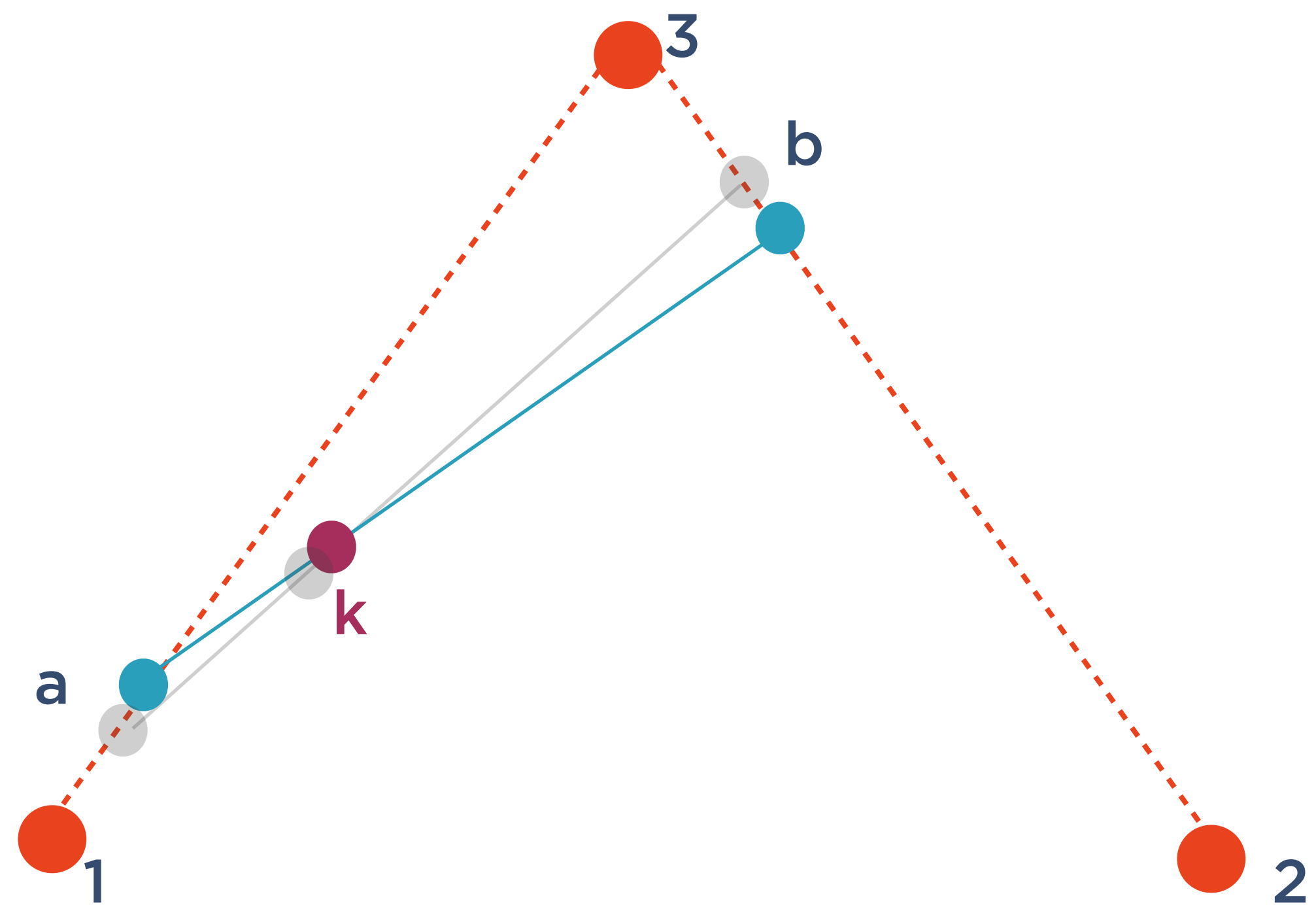
Bezier Curve



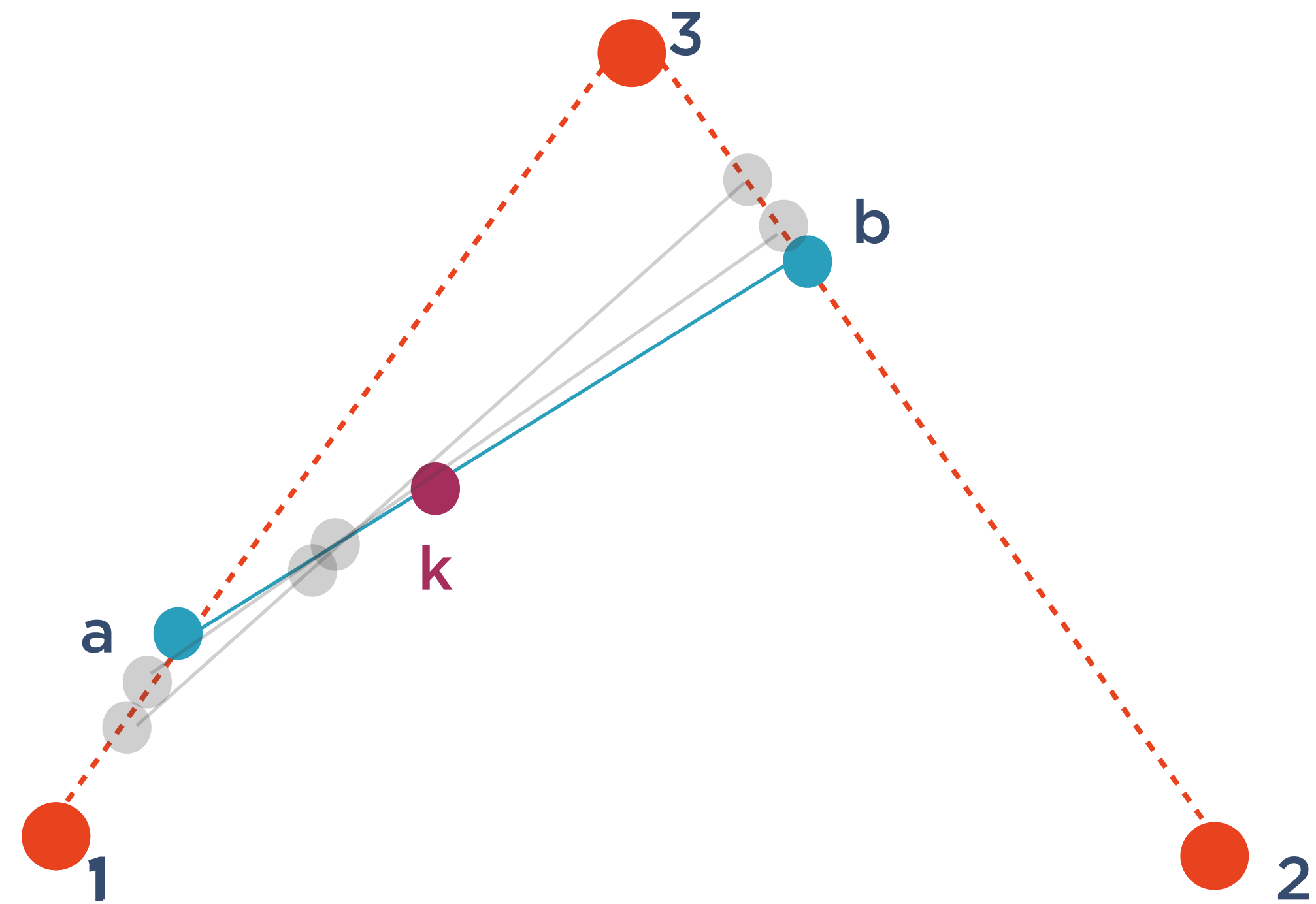
Points a and b will interpolate along the orange line

Point k will interpolate along the blue line

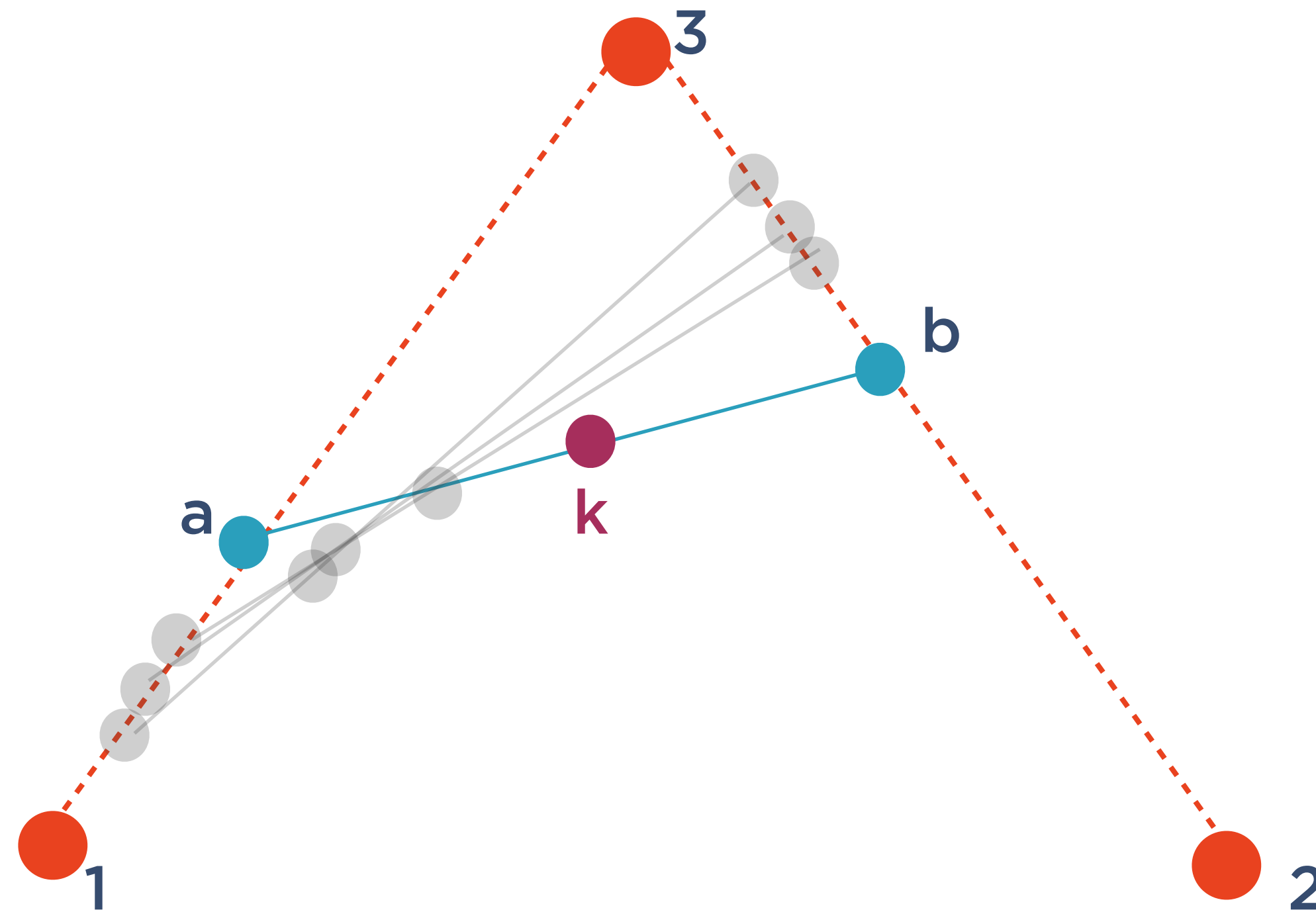
Bezier Curve



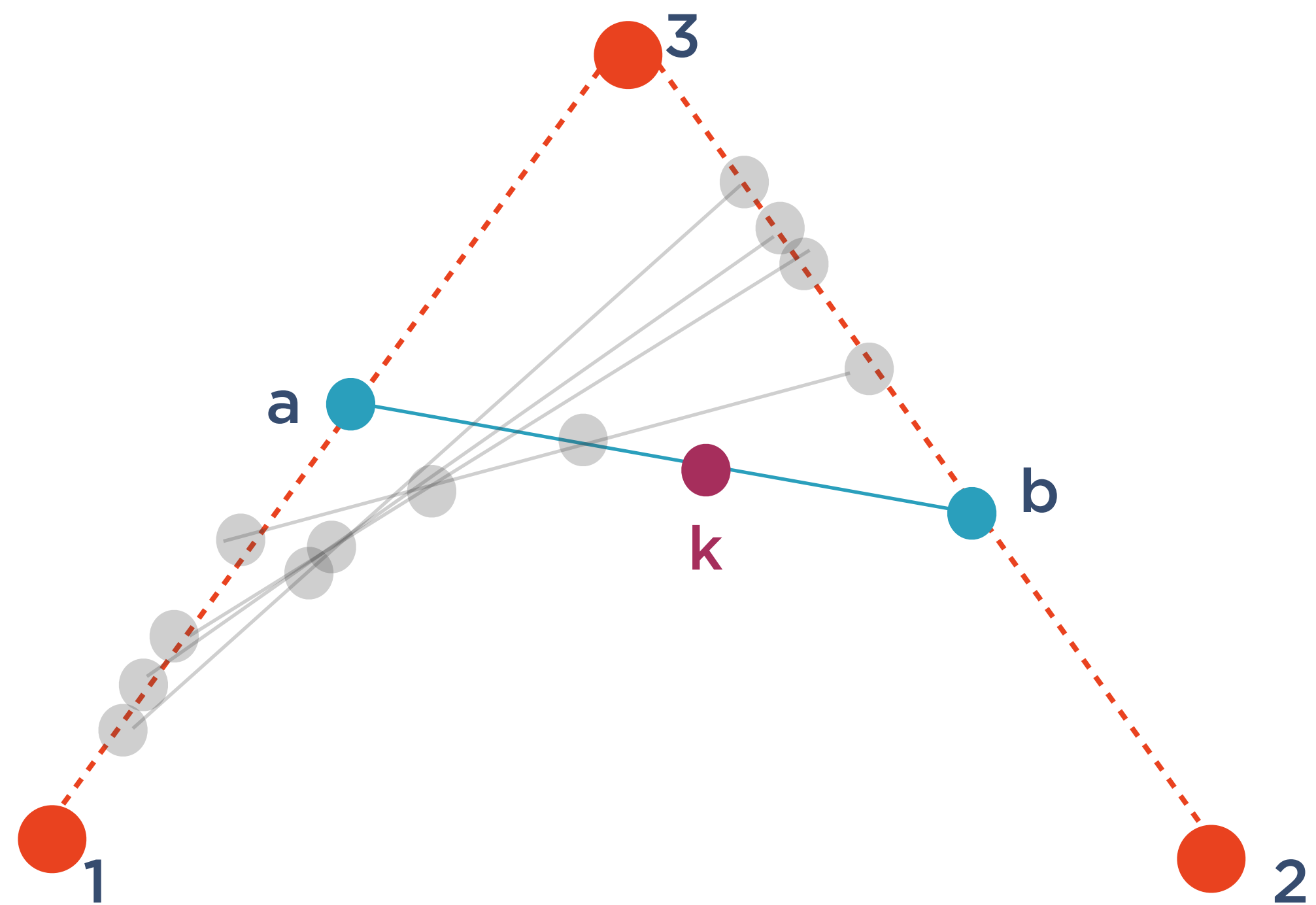
Bezier Curve



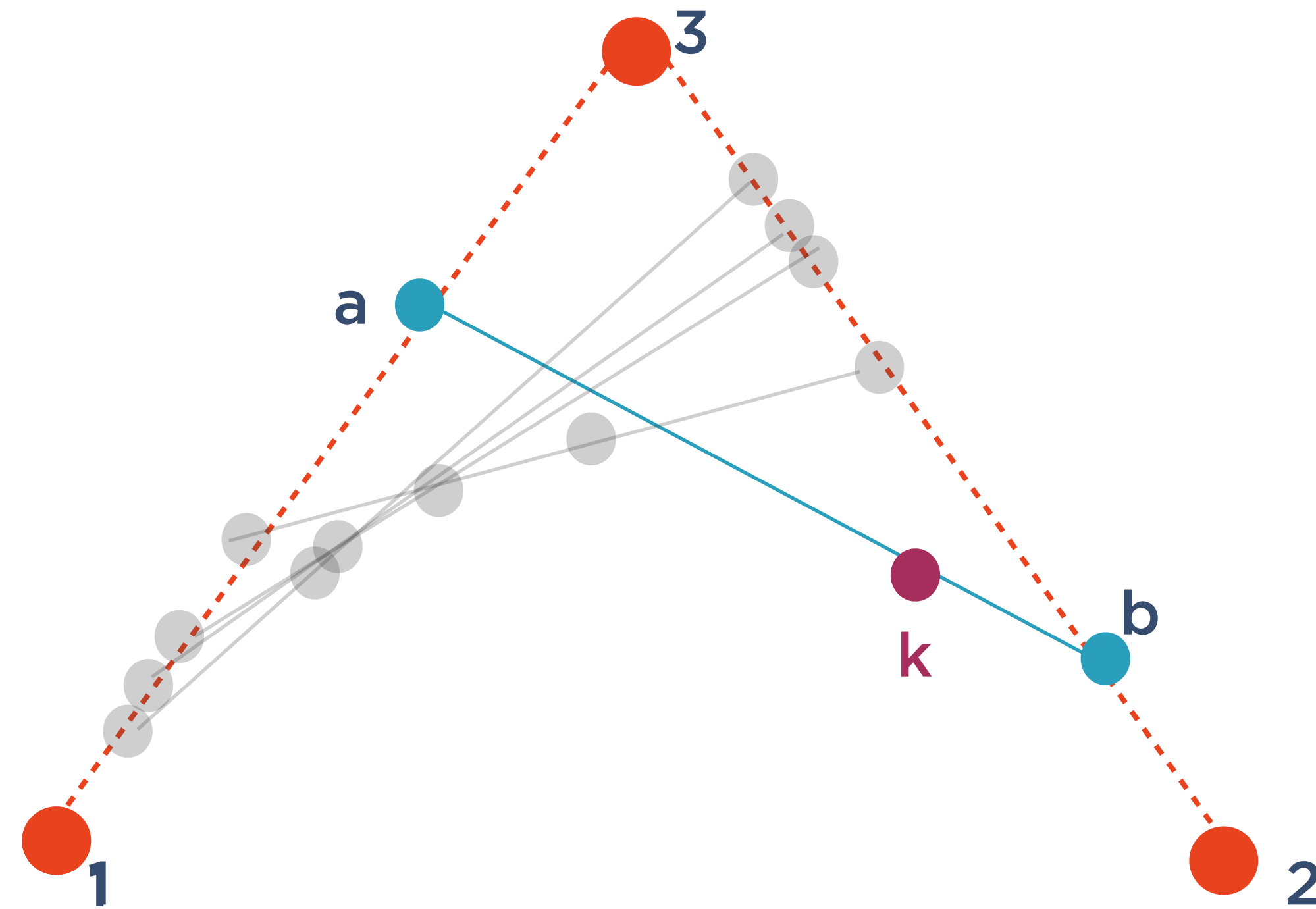
Bezier Curve



Bezier Curve

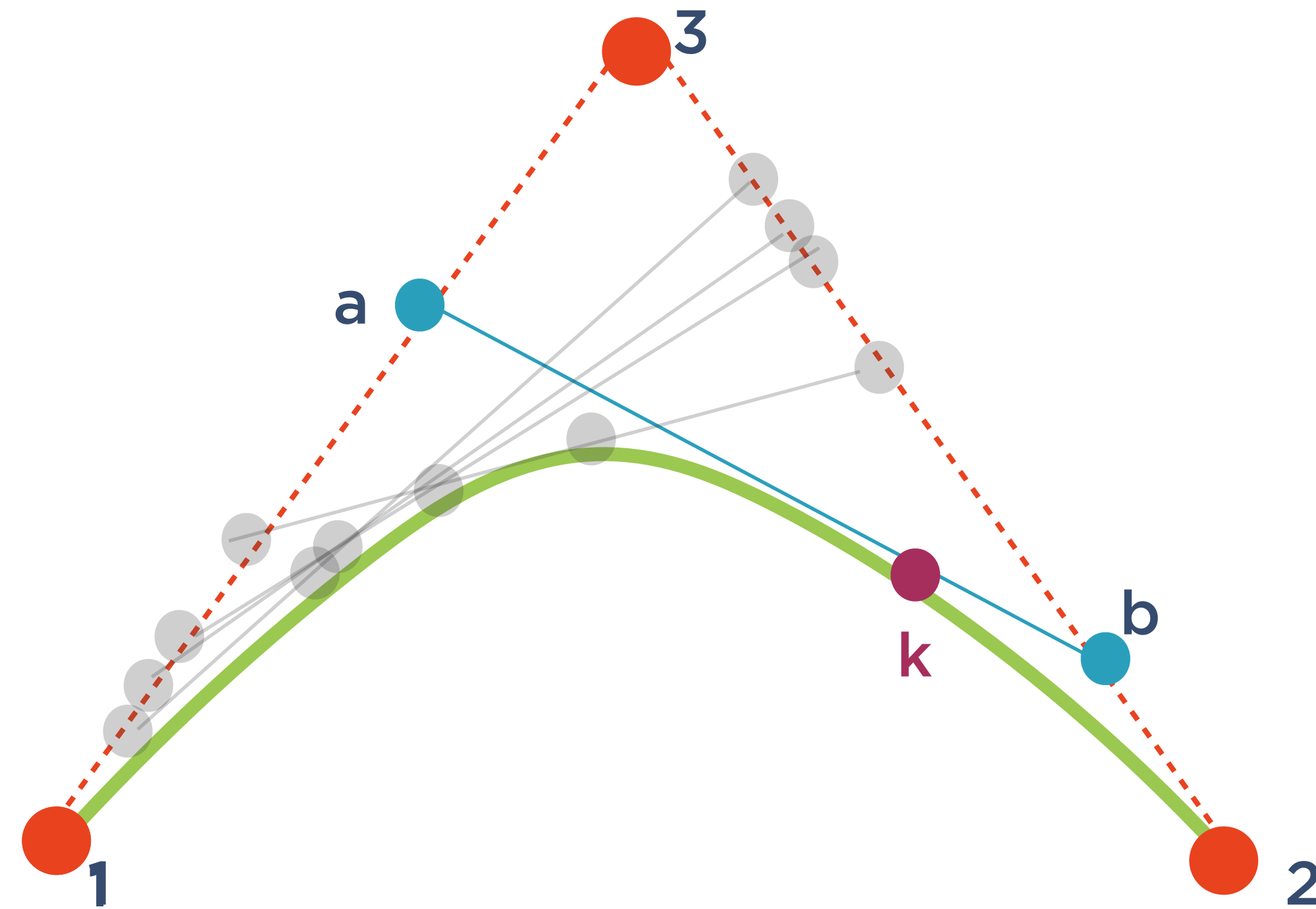


Bezier Curve



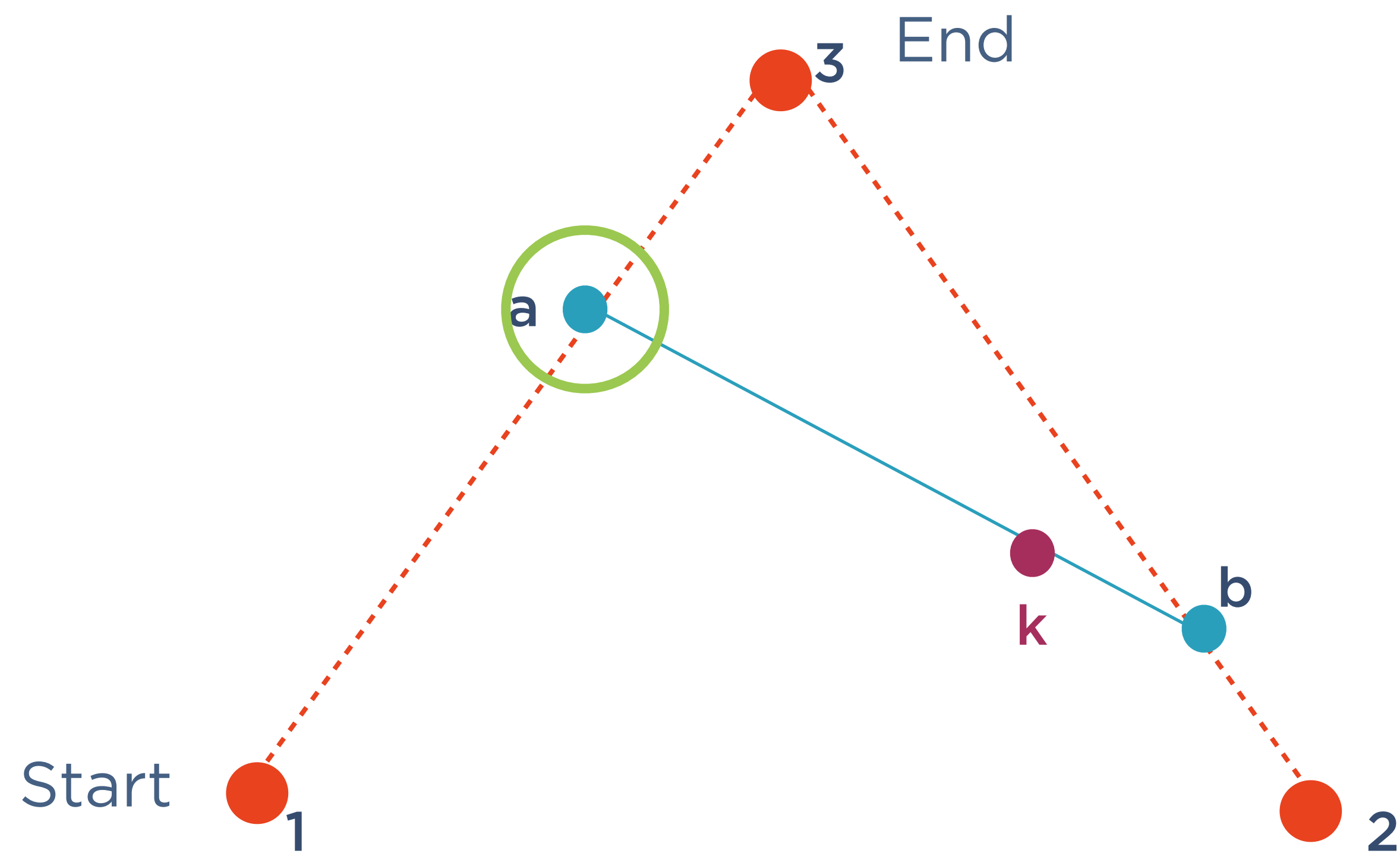
Point k traces out the curve in space

Bezier Curve

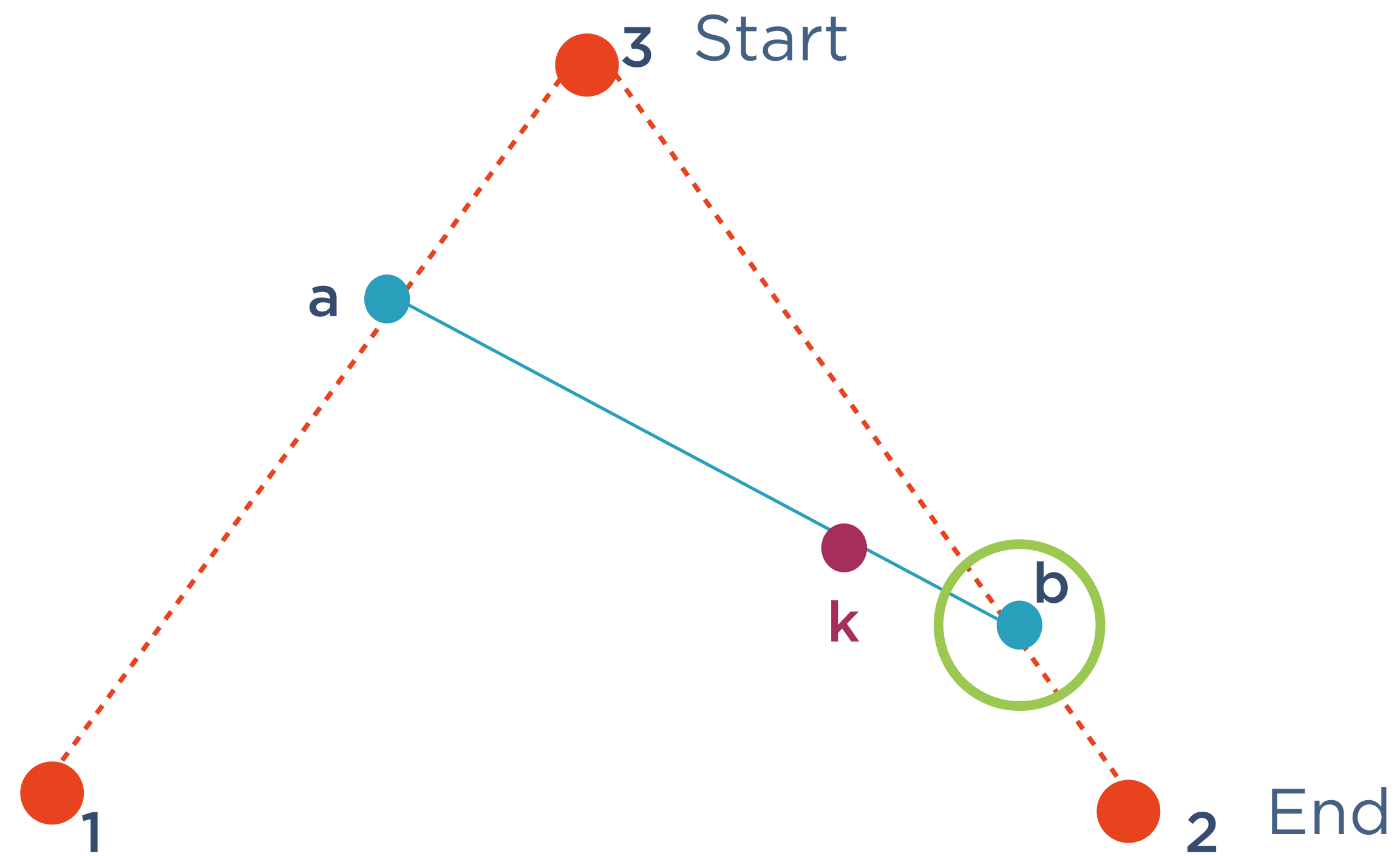


Point k traces out the curve in space

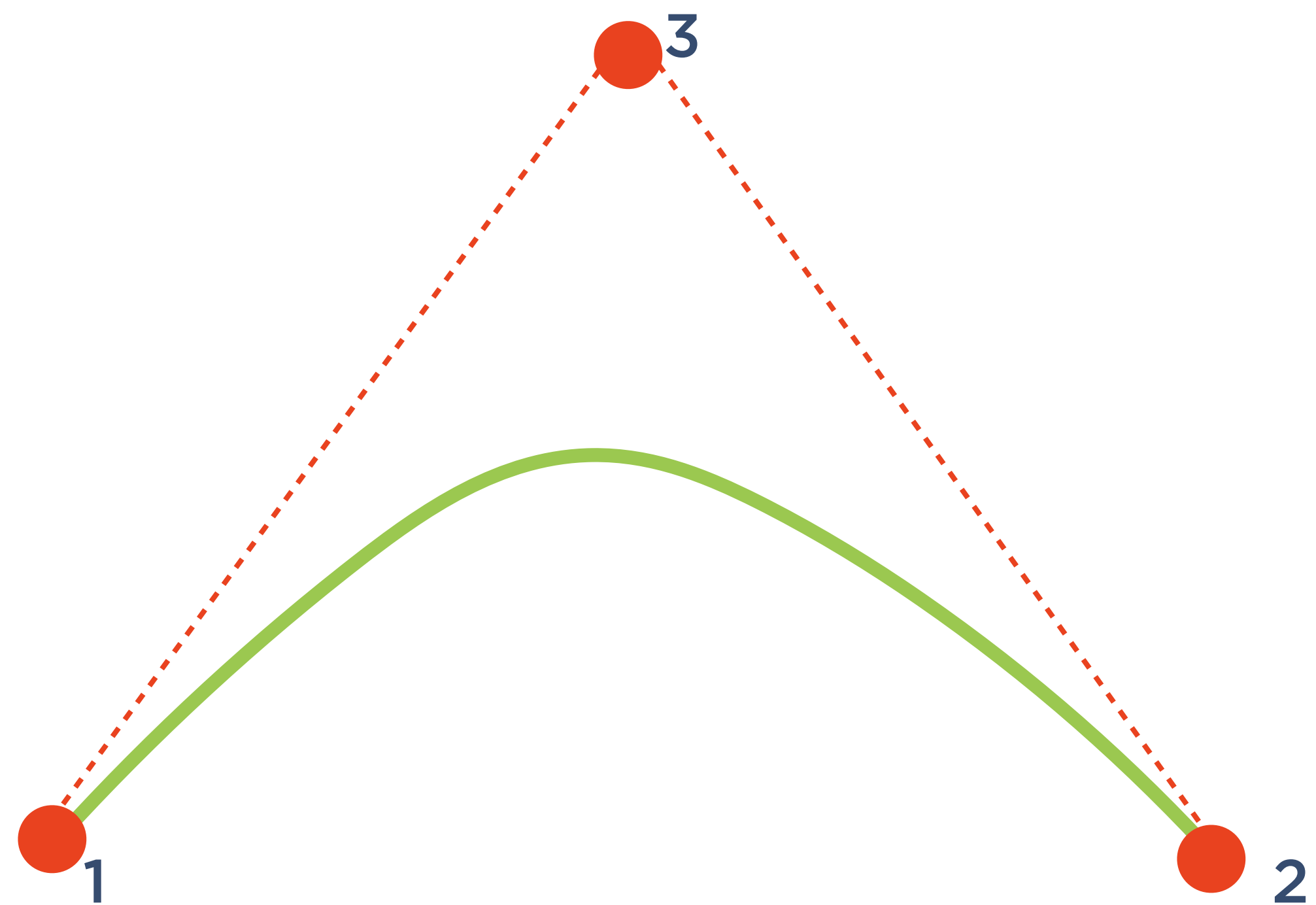
Bezier Curve



Bezier Curve



Bezier Curve



Result is a smooth curve

Use of Bezier Curves



Computer graphics, vector graphics



Modelling, animations, typography



Web development

Demo

Curves

Demo

Annotations

Demo

Scales

Demo

Twin axes

Summary

Plot complex shapes, polygon and Bezier curves

Text annotations on graphs to convey information

Different units on the same axis using twin axis

Different scales on each axis