

Curves

1. Consider a quadratic Bezier curve with control points $(-2,0)$, $(0,2)$, $(2,0)$. What are the endpoints and midpoint of this curve?
2. Now consider the quadratic B-spline curve with the same control points. What are the endpoints and midpoint of this curve?
3. Consider again the B-spline curve from (2). What are the control points necessary to make a Bezier curve identical to this curve?
4. Consider again the Bezier curve from (1). What are the control points necessary to make a B-spline curve identical to this curve?

Transformations

1. Suppose you want to apply the following two transformations to an object:
 - Translate along the z-axis by -5 units
 - Rotate about the y-axis by 30 degreesYou want to apply them in the order above. What is the composite transformation matrix that will give the desired effect?
2. Now suppose you want to apply these two transformations to an object:
 - Rotate about the x-axis by 45 degrees
 - Scale by a factor of 3 along the y-axisAgain, you want to apply them in the order above. What is the composite transformation matrix needed to correctly transform the ***surface normals*** of the object?