

# Computer Graphics

Lecture 30

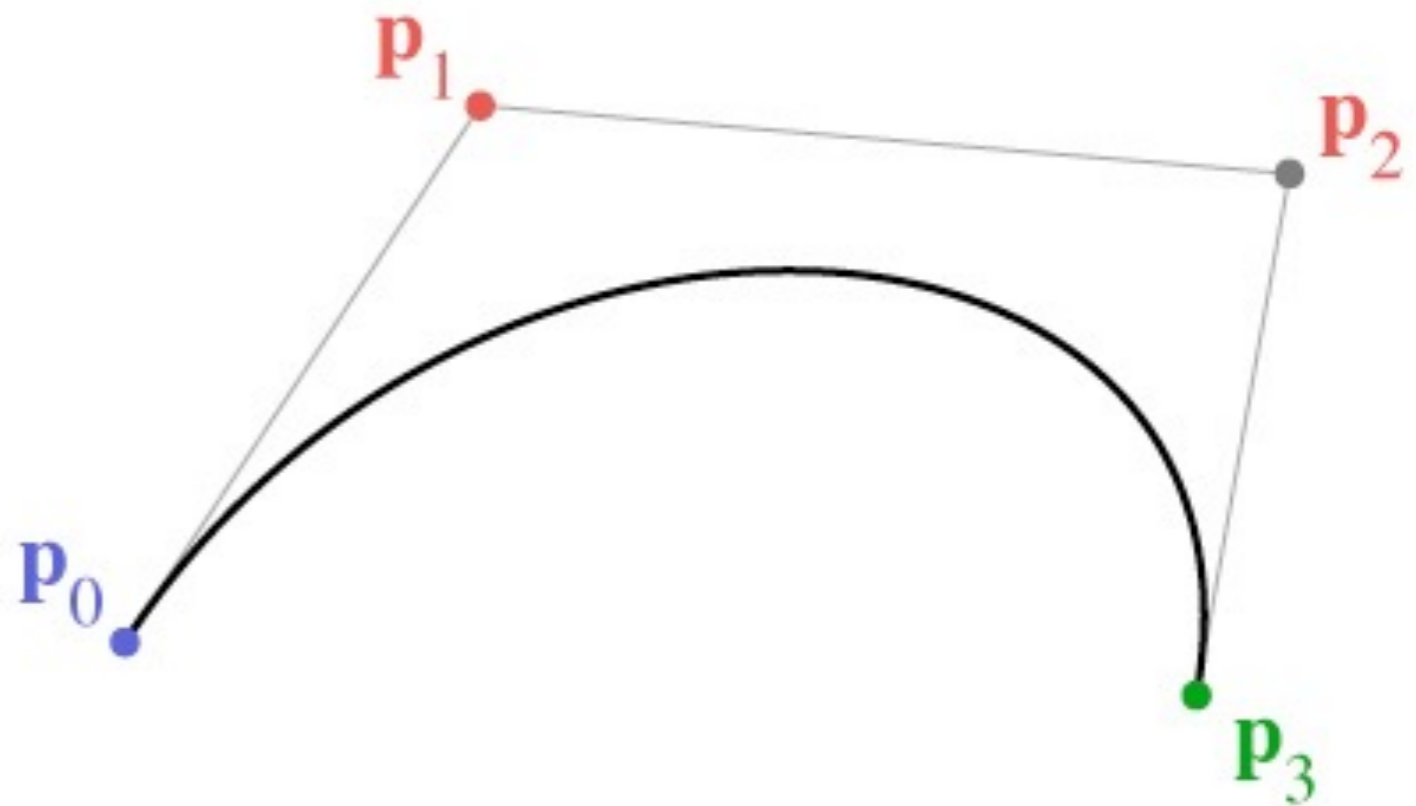
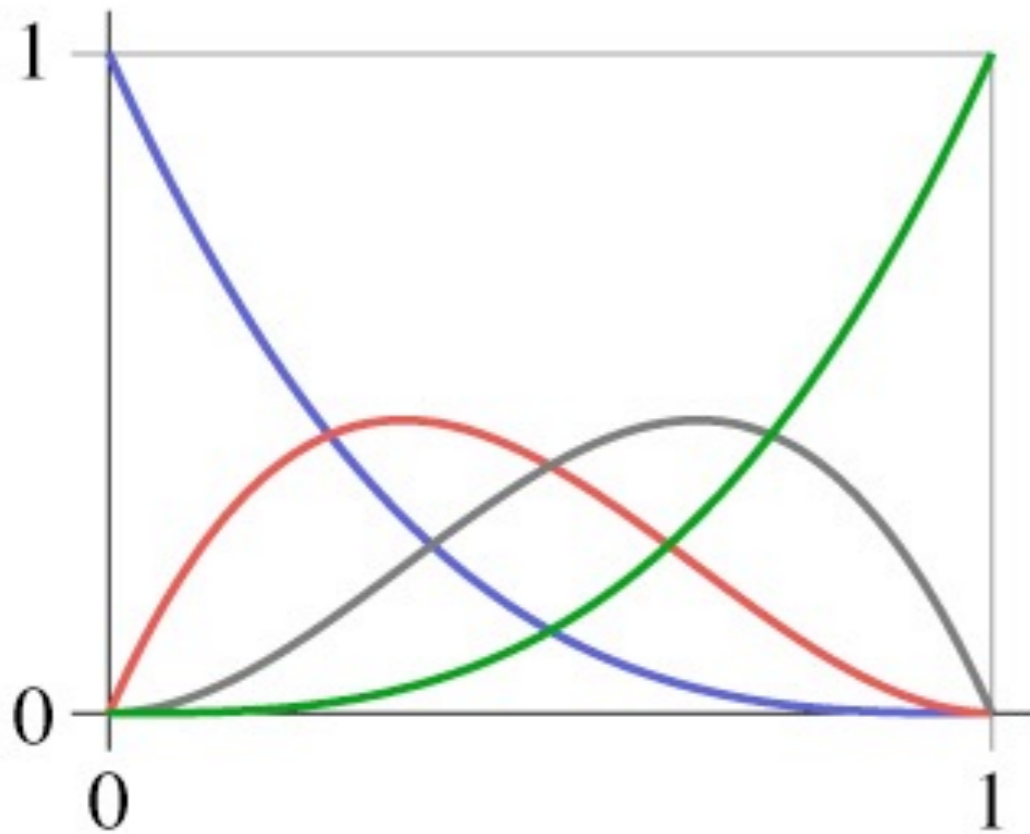
**Bézier Curves**

**de Casteljau's Algorithm**

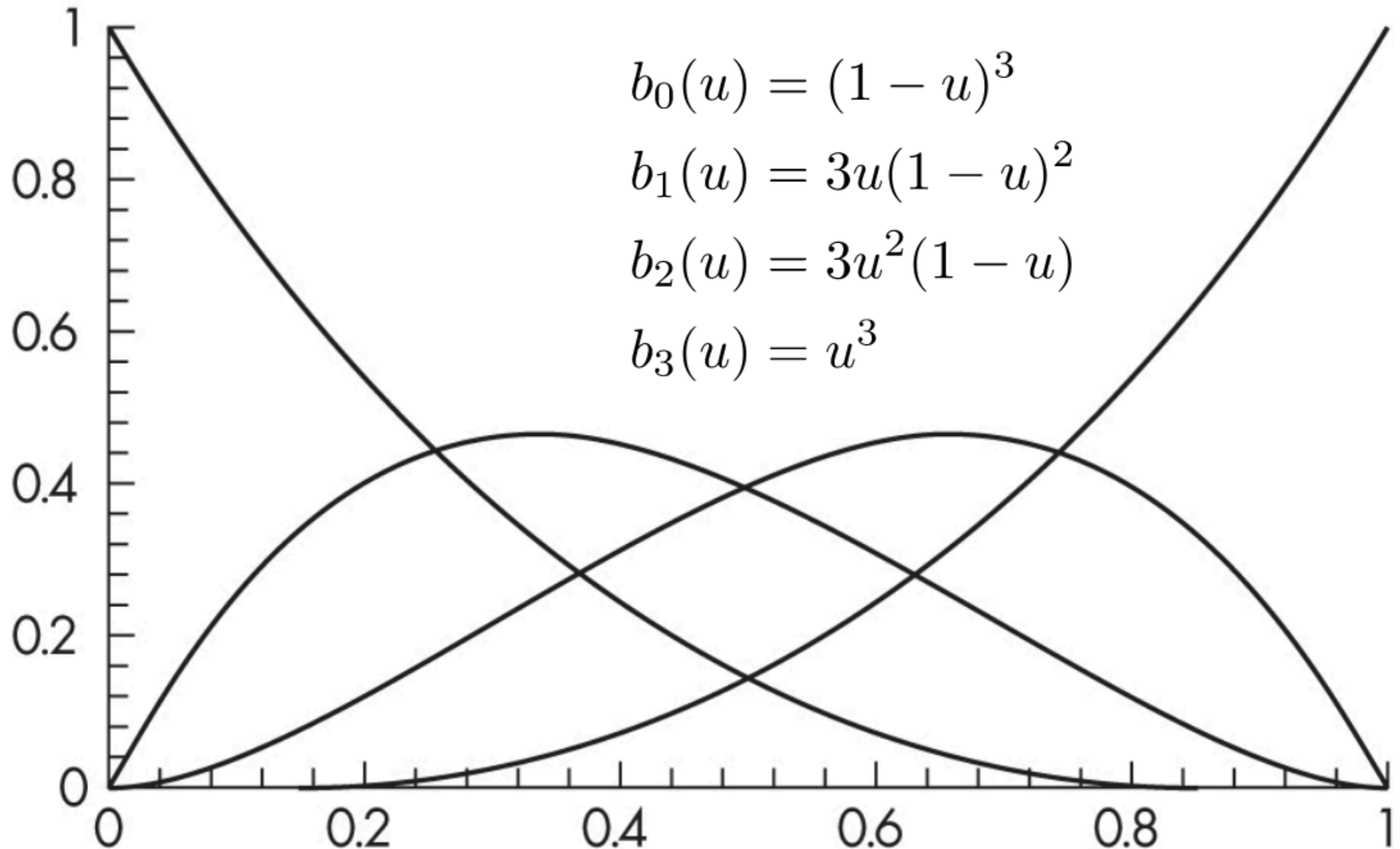
# Why is it called a "Basis Matrix"?

- We have:  $f(u) = \mathbf{u}^T B \mathbf{p}$
- For computational purposes, we'll want to precompute  $B \mathbf{p}$ .
  - This is the vector of  $a_i$ 's that weights each power of  $u$
- How would we interpret  $\mathbf{u}^T B$ ?
  - A polynomial that specifies the weight on each control point.

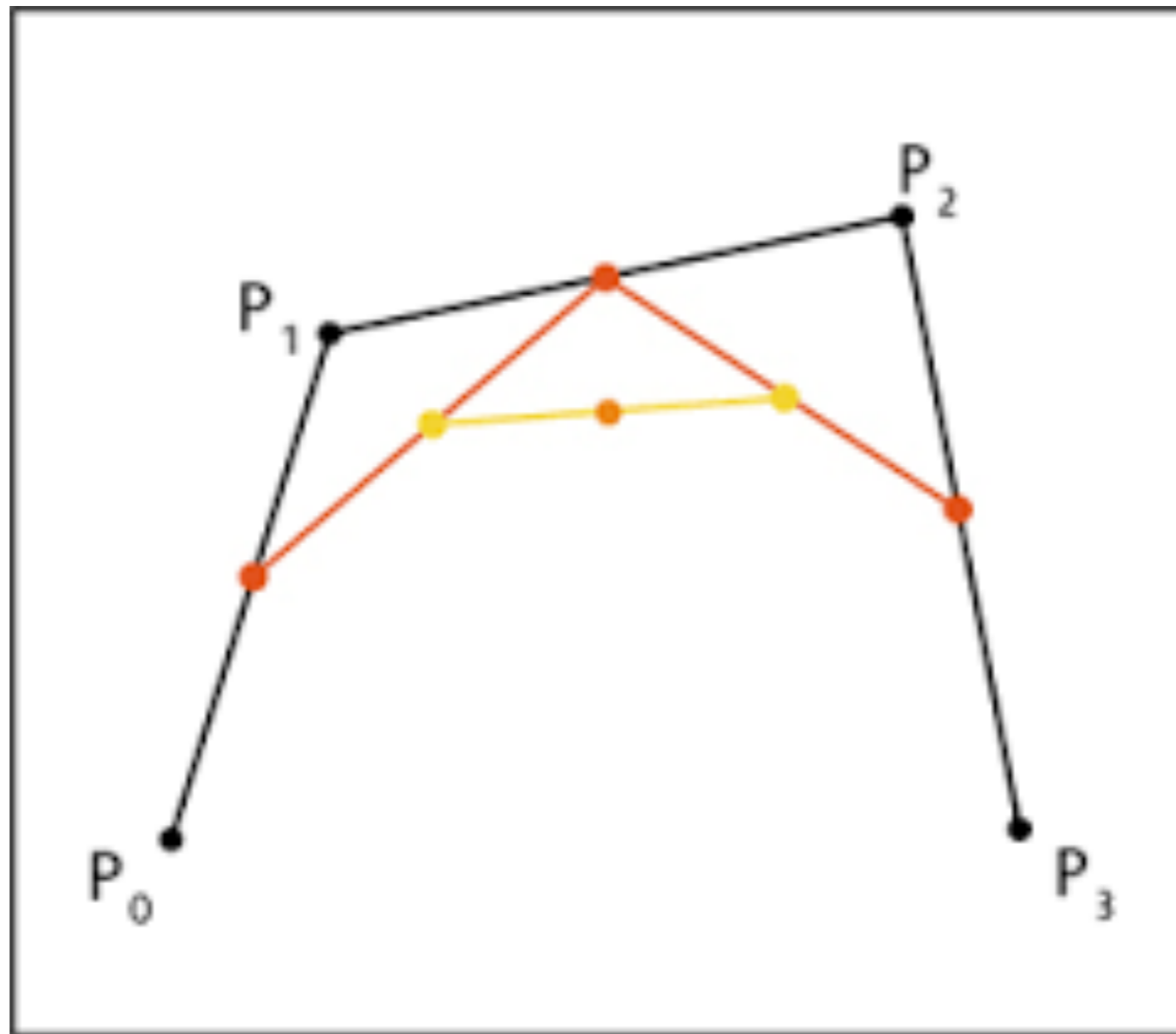
# Blending Functions



# Cubic Bezier blending functions



# Bezier Curves: Geometry



# Coollest / most satisfying animation of the quarter

<https://www.jasondavies.com/animated-bezier/>

# Joining Segments

- <http://math.hws.edu/eck/cs424/notes2013/canvas/bezier.html>

# Curves are great, but.

<https://youtu.be/AcFwH161XtM?t=68>

<https://youtu.be/Zkx1aKv2z8o?t=1080>