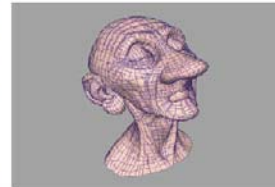




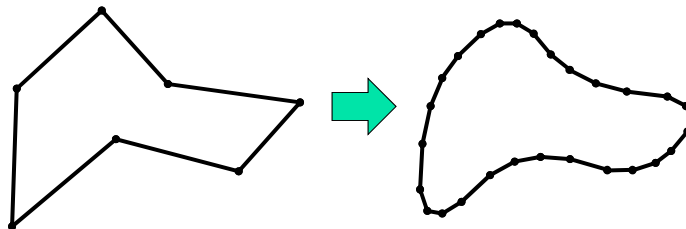
## Chapter 15

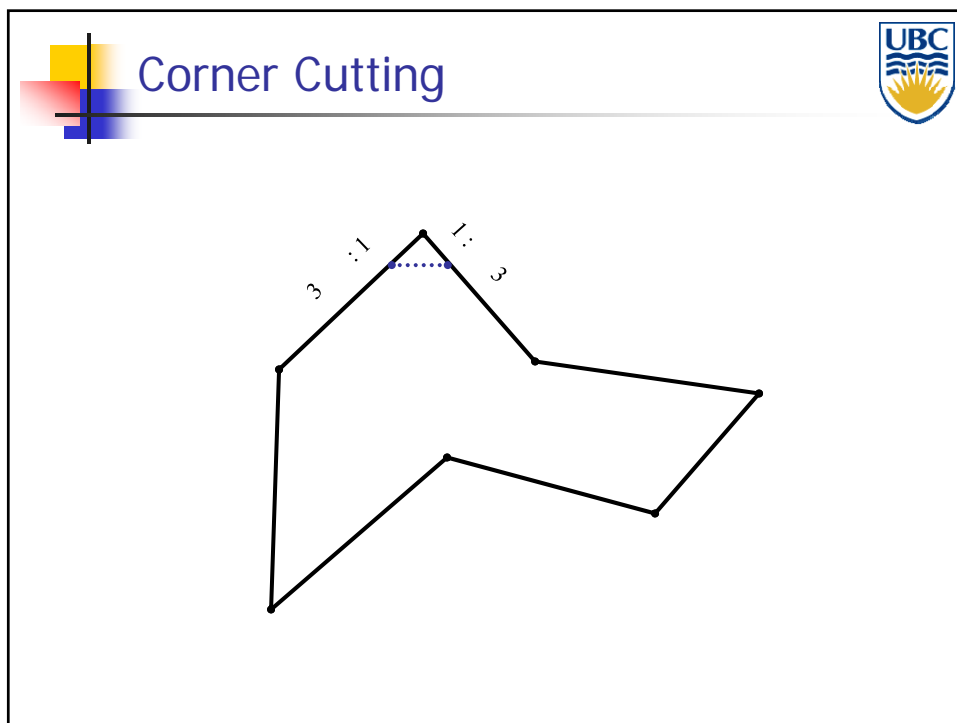
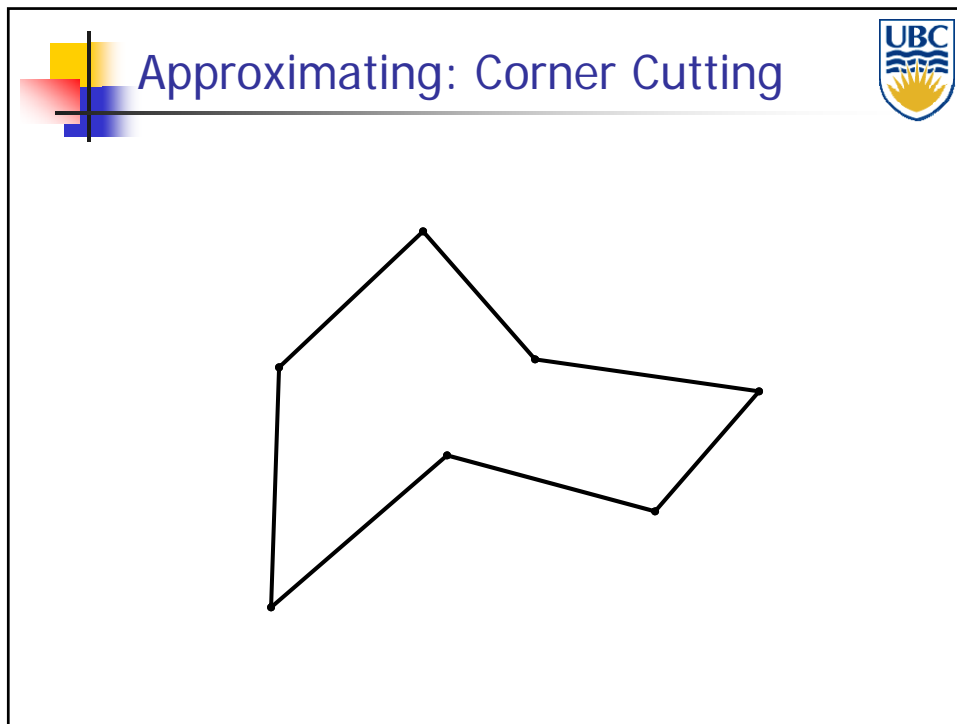
### Geometric Modeling: Subdivision

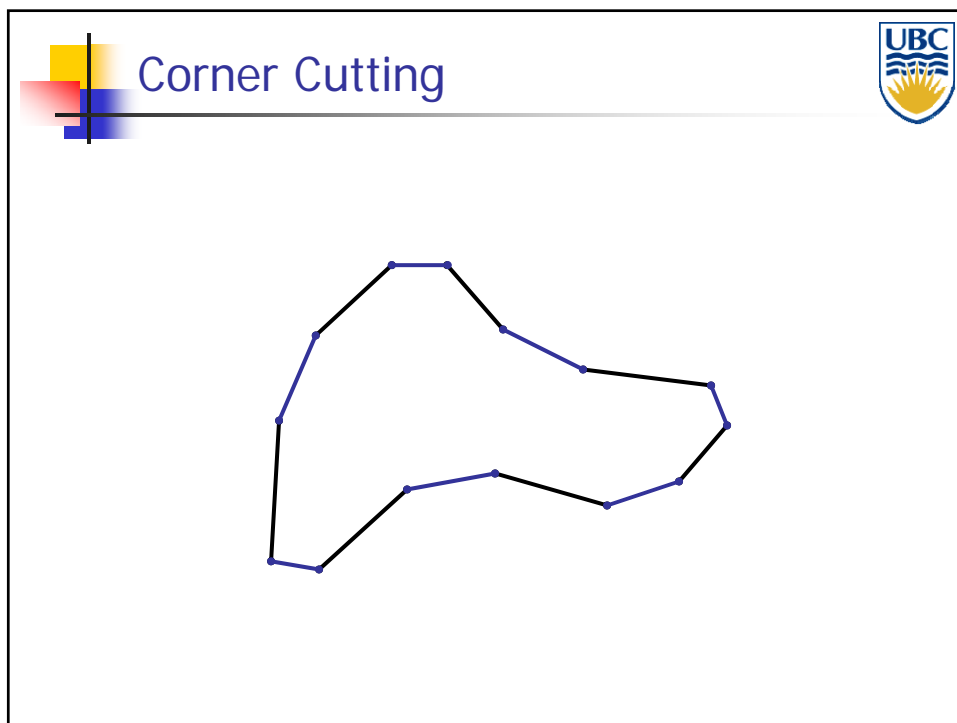
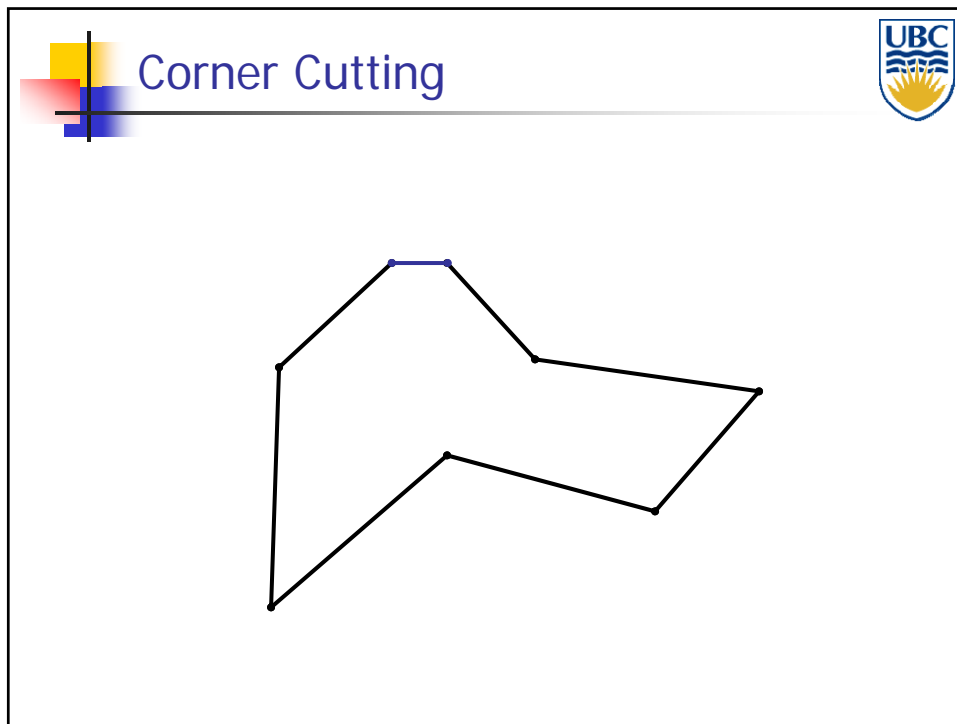


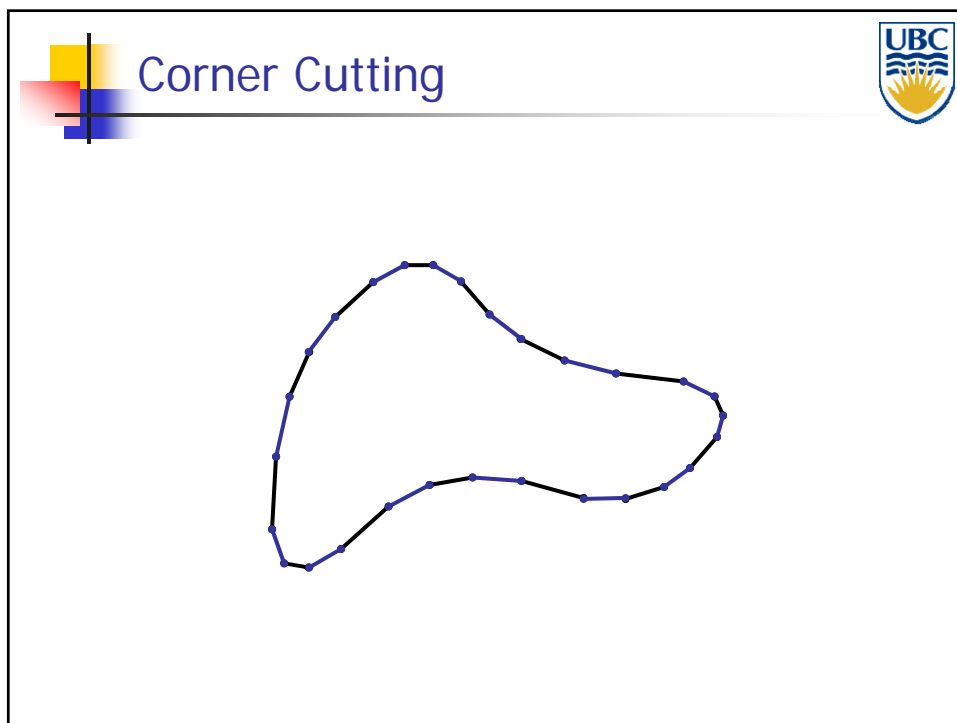
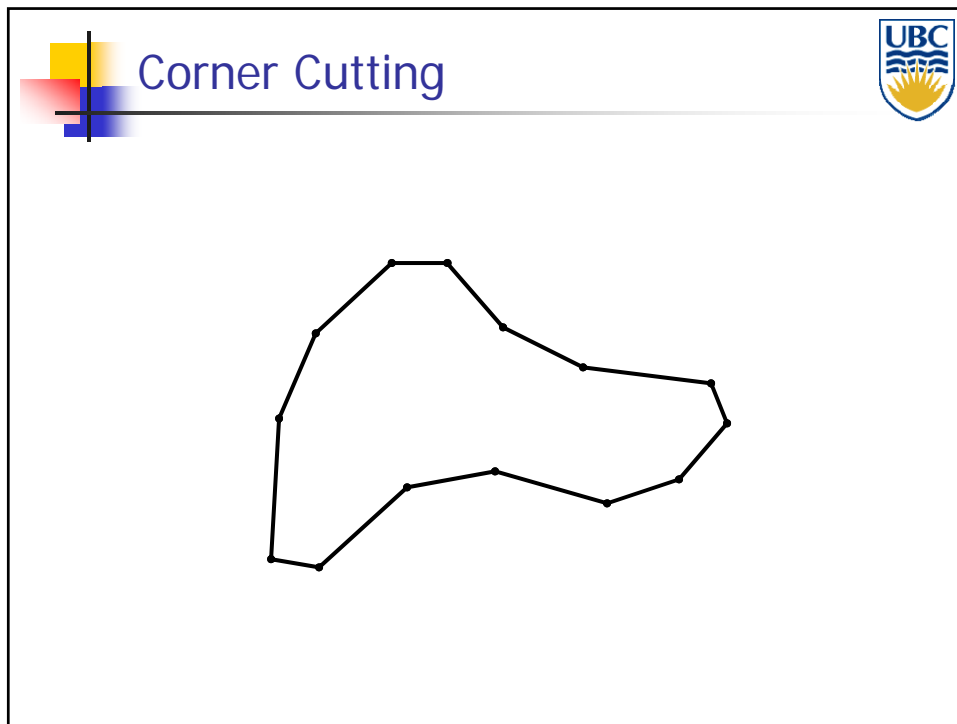
## Subdivision Curves

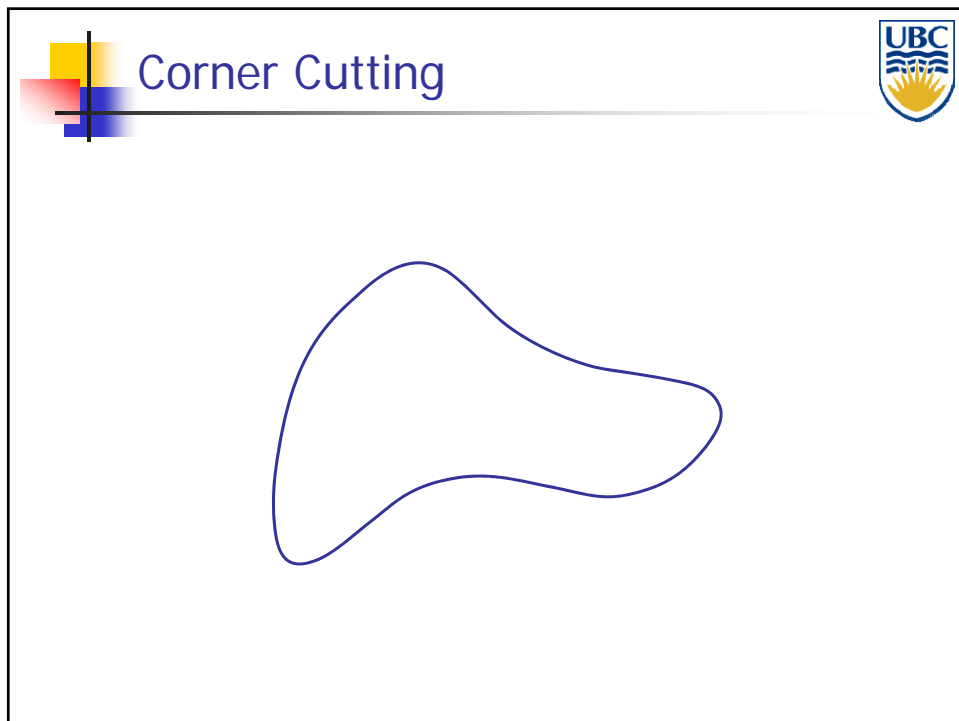
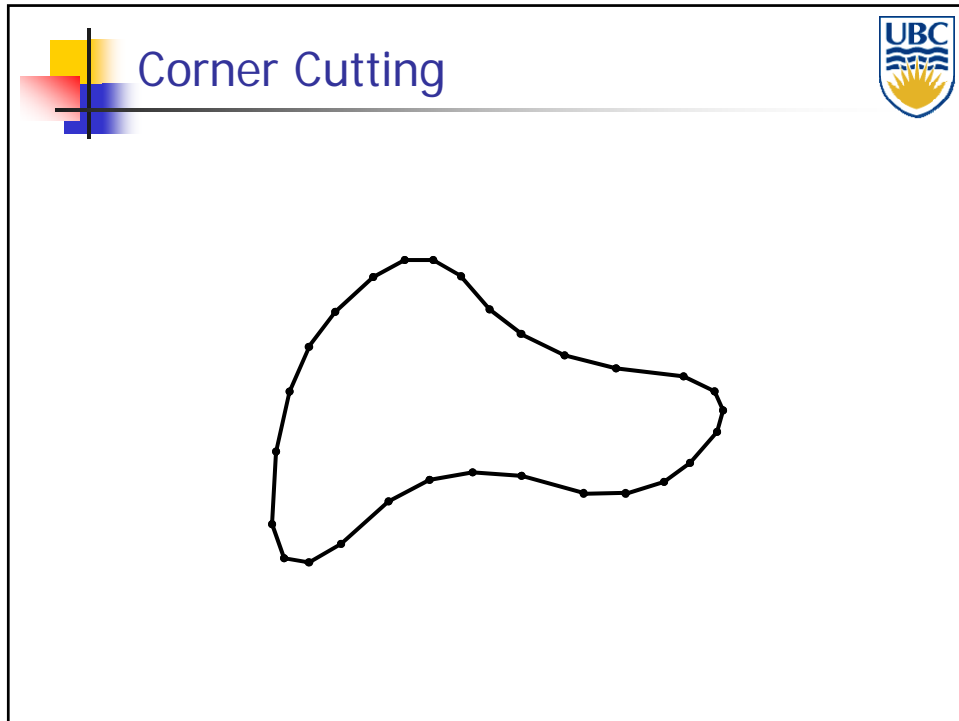
- Represent smooth curve by approximating polyline
- At the limit = curve
- Recursive refinement - Each iteration add new points (~double)





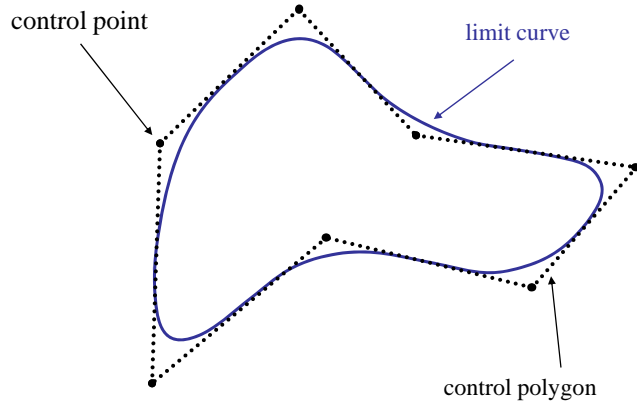








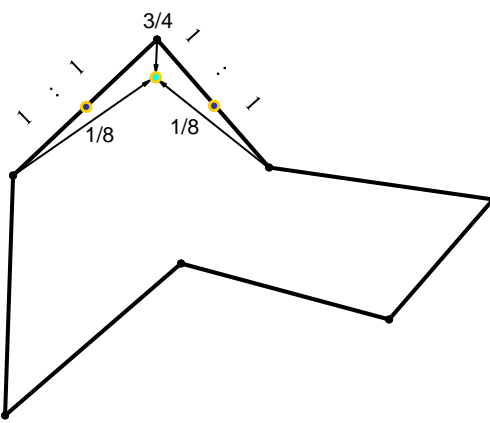


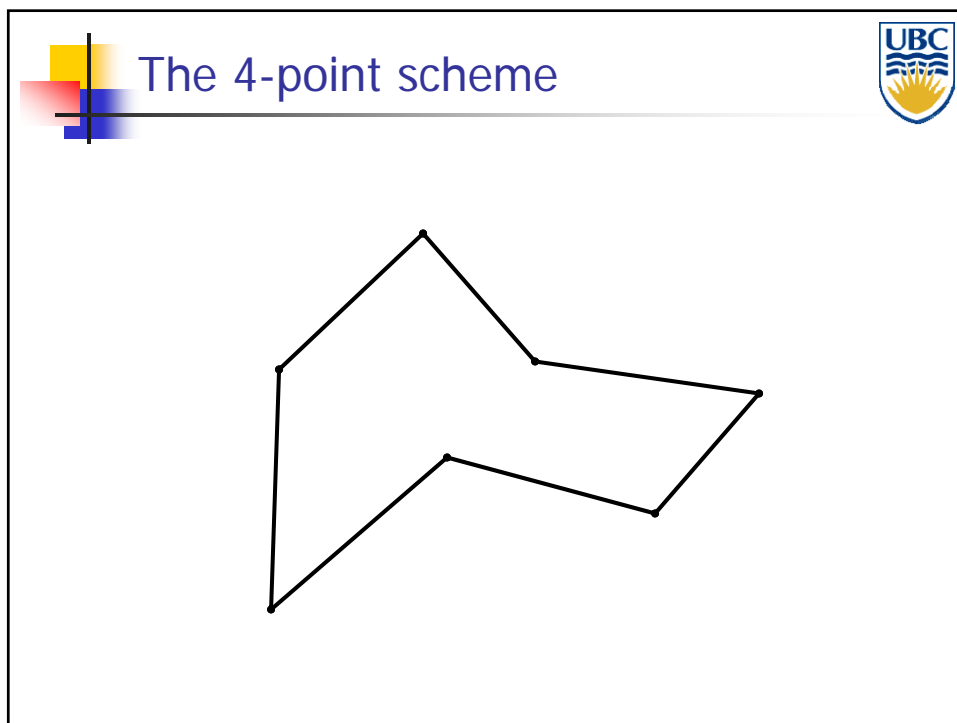
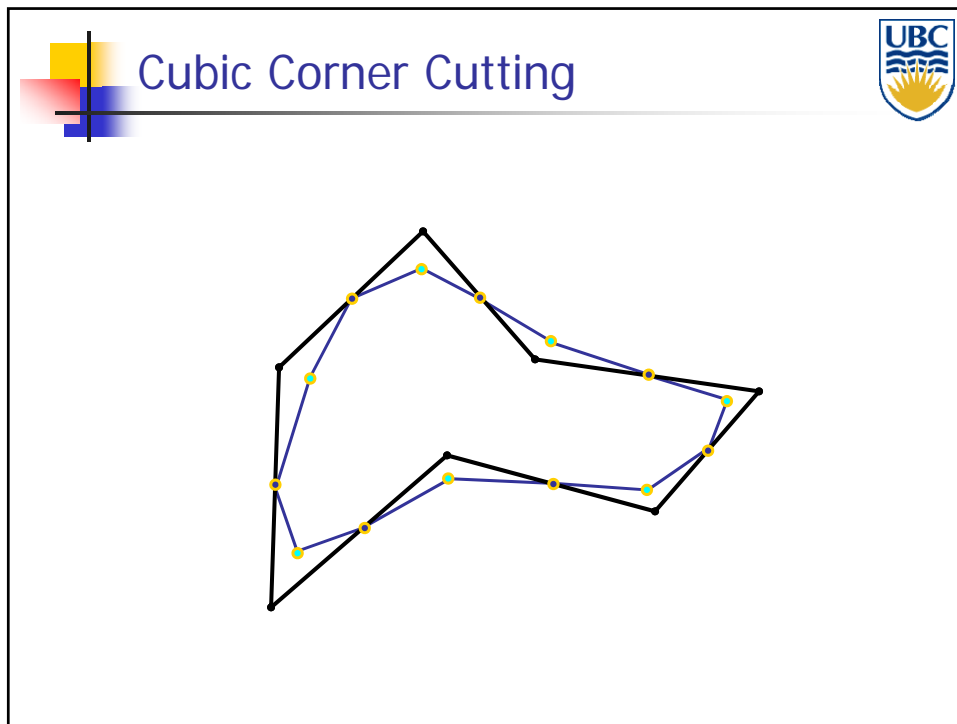
 **Corner Cutting – Chaikin Algorithm** 

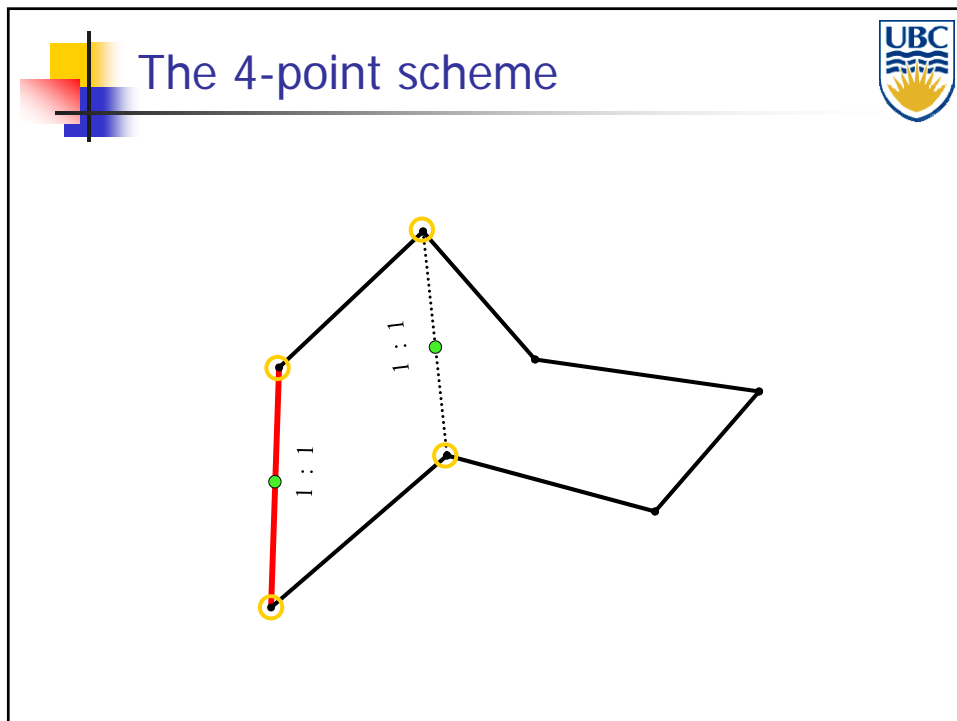
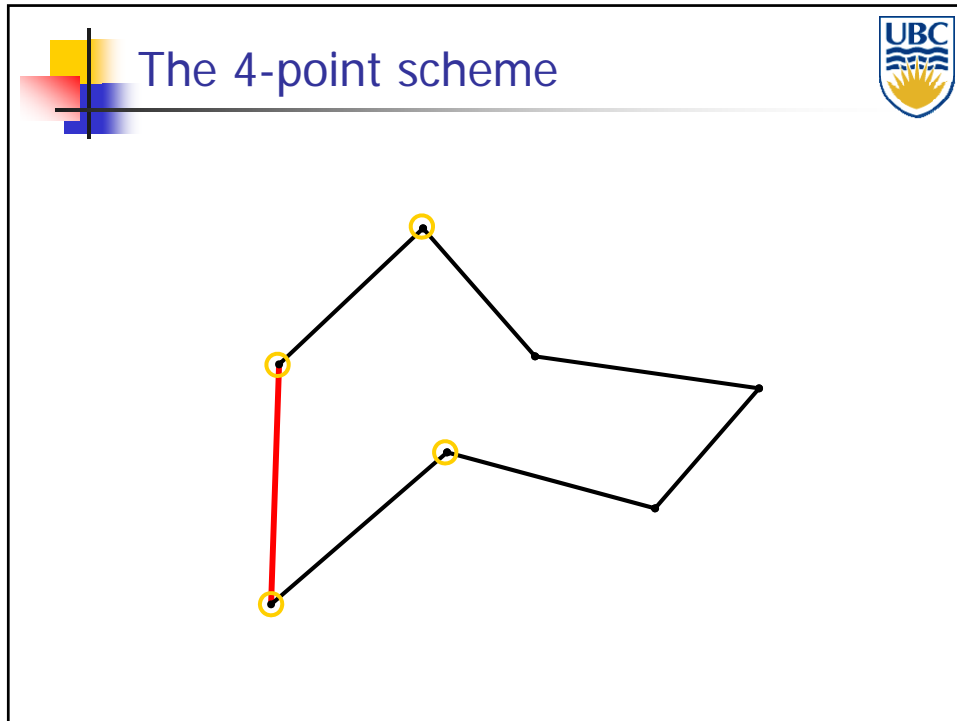


■ Limit – quadratic B-spline curve

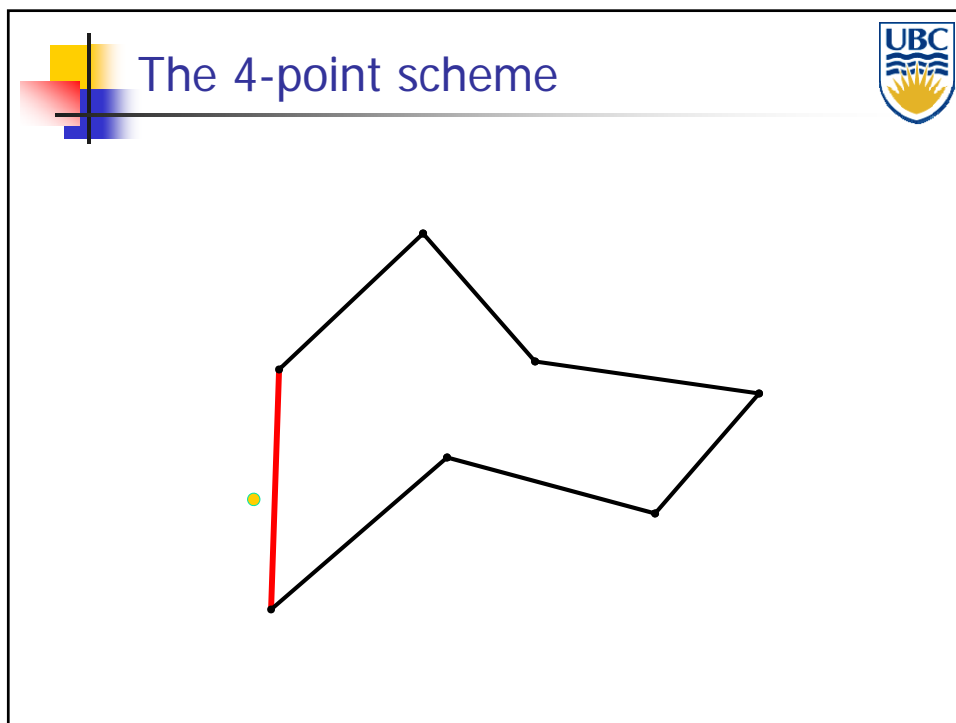
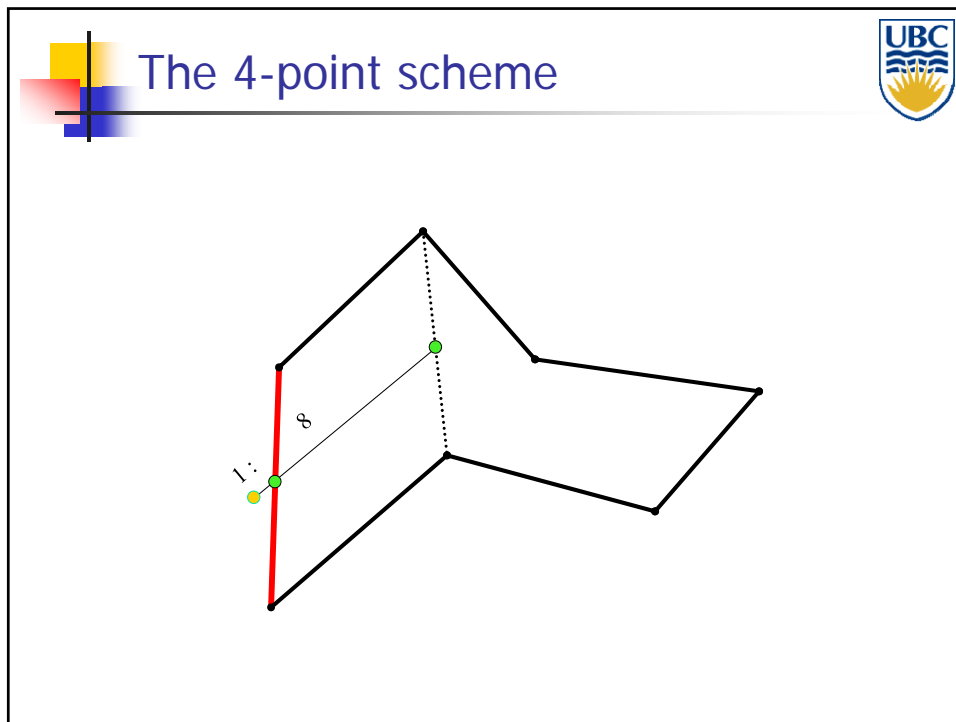
 **Cubic B-Spline (corner cutting)** 

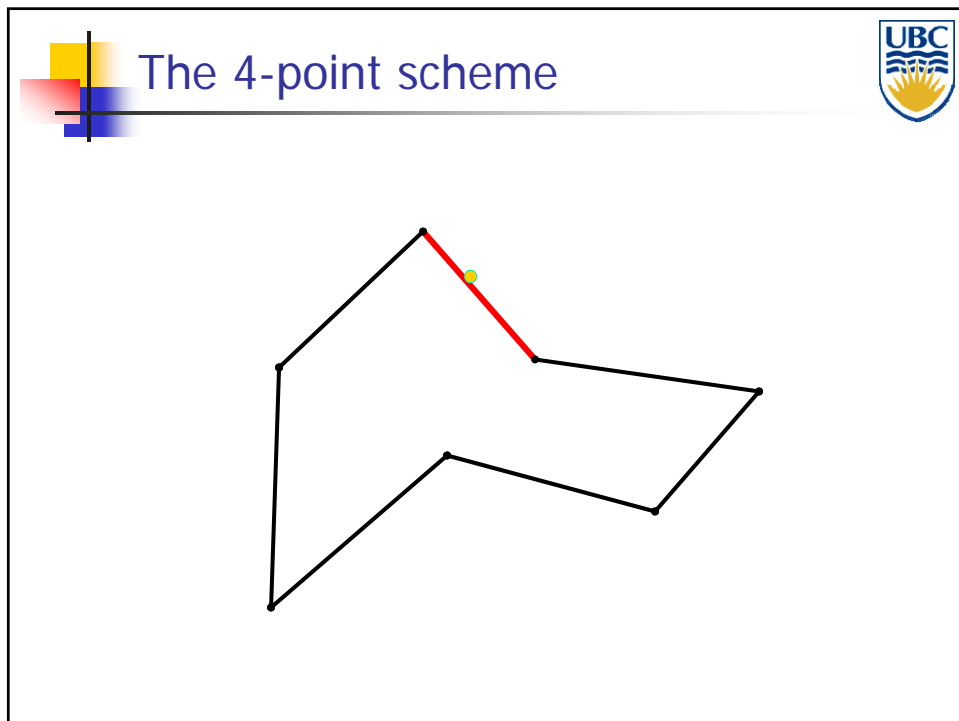
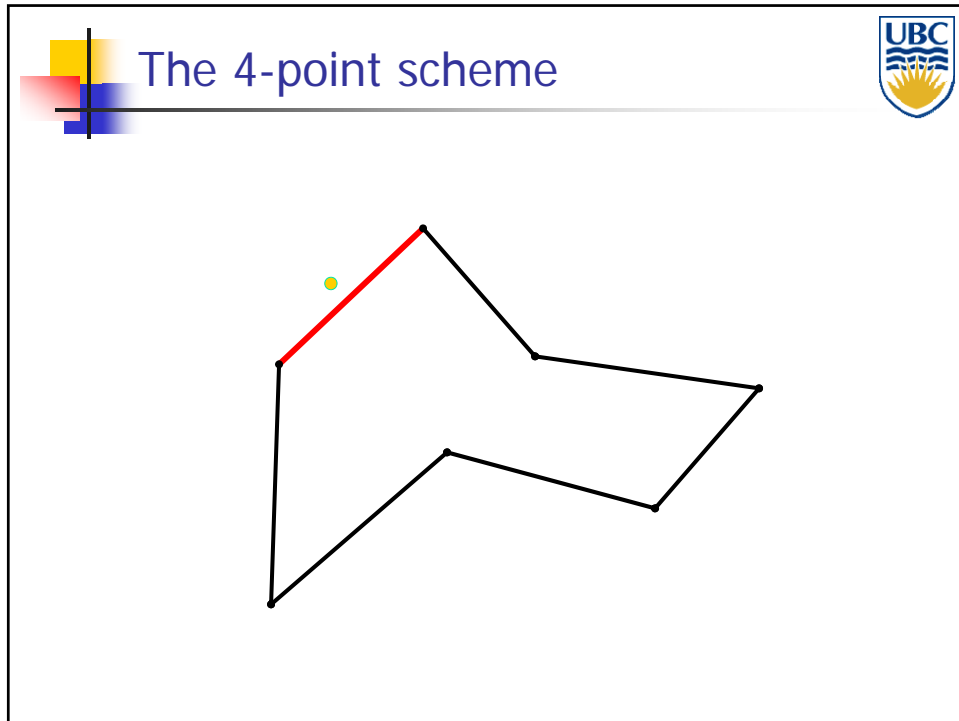


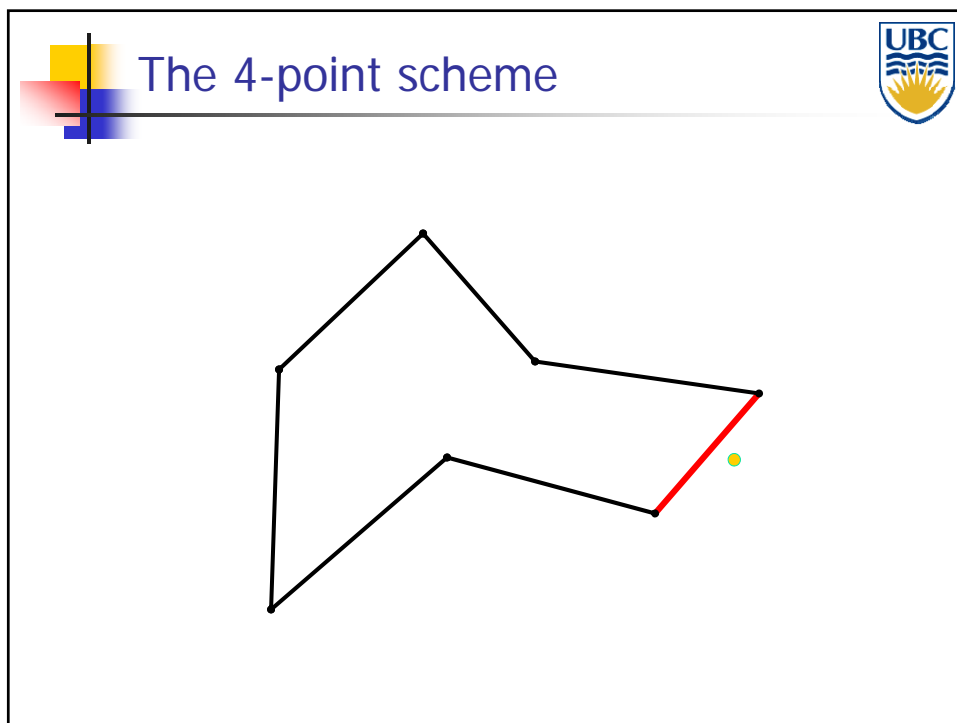
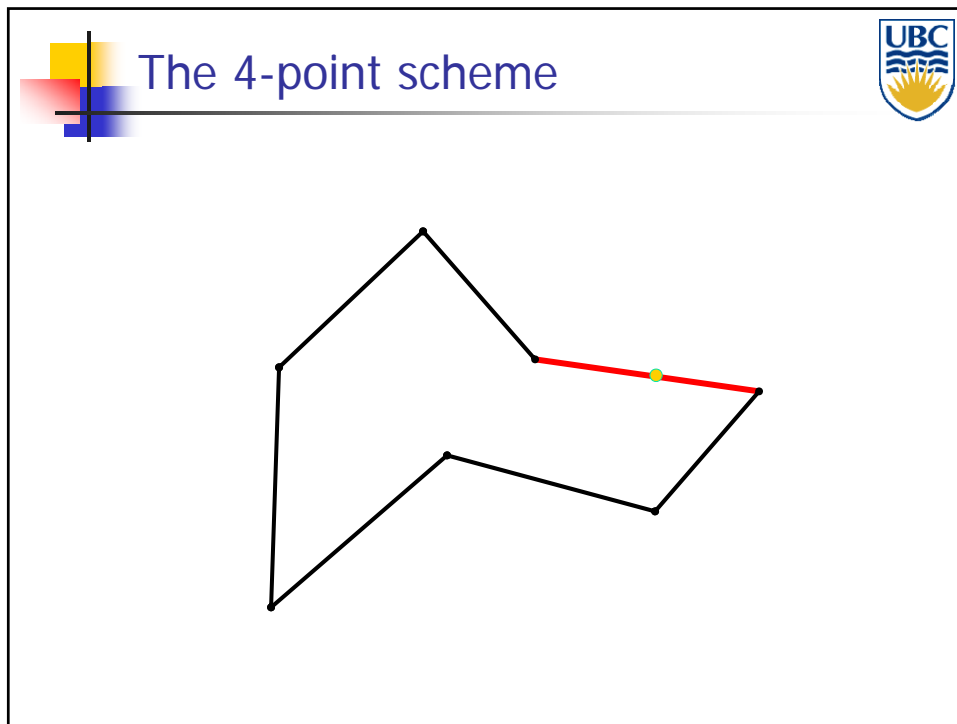


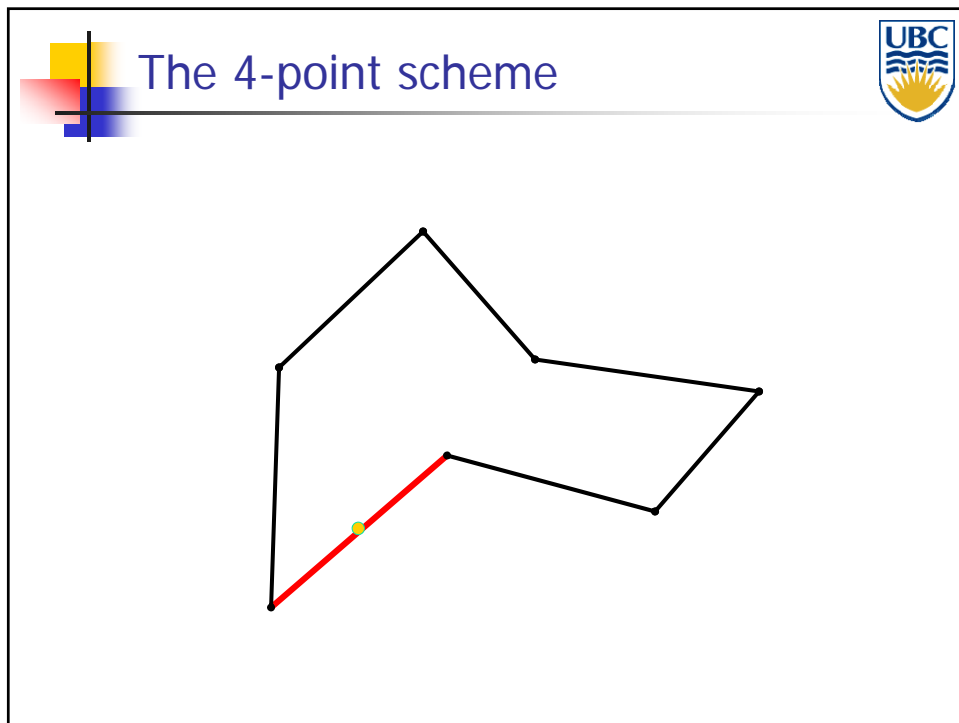
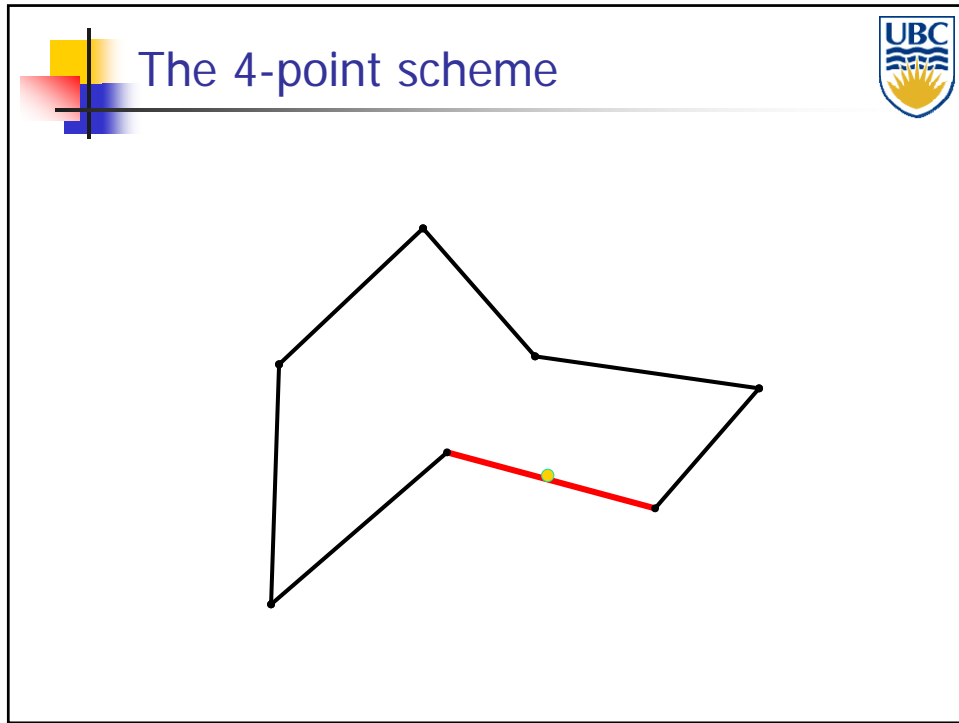


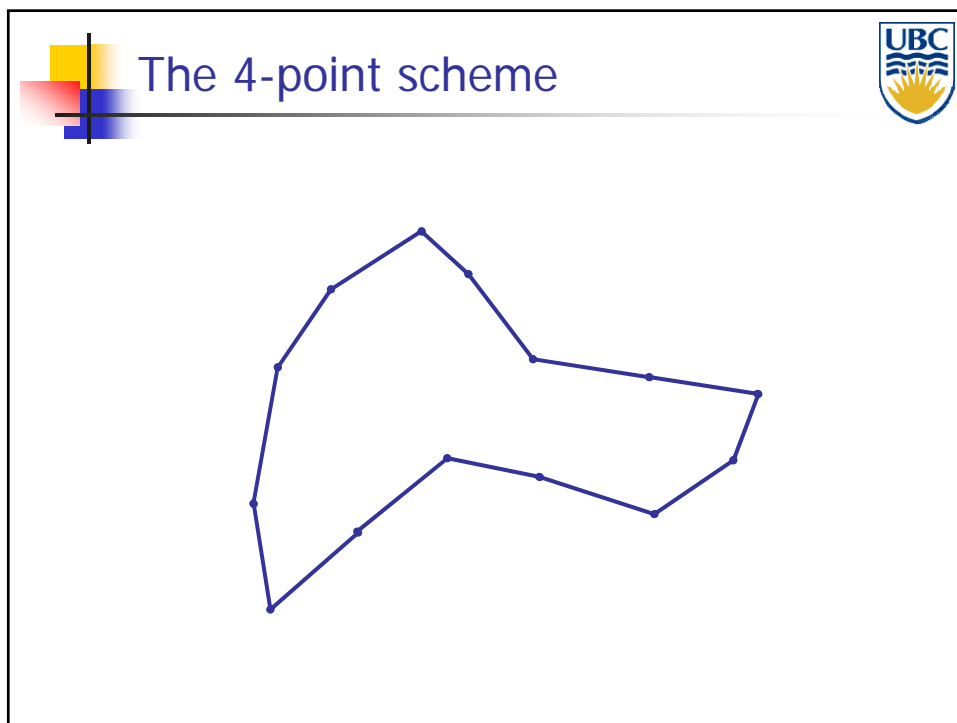
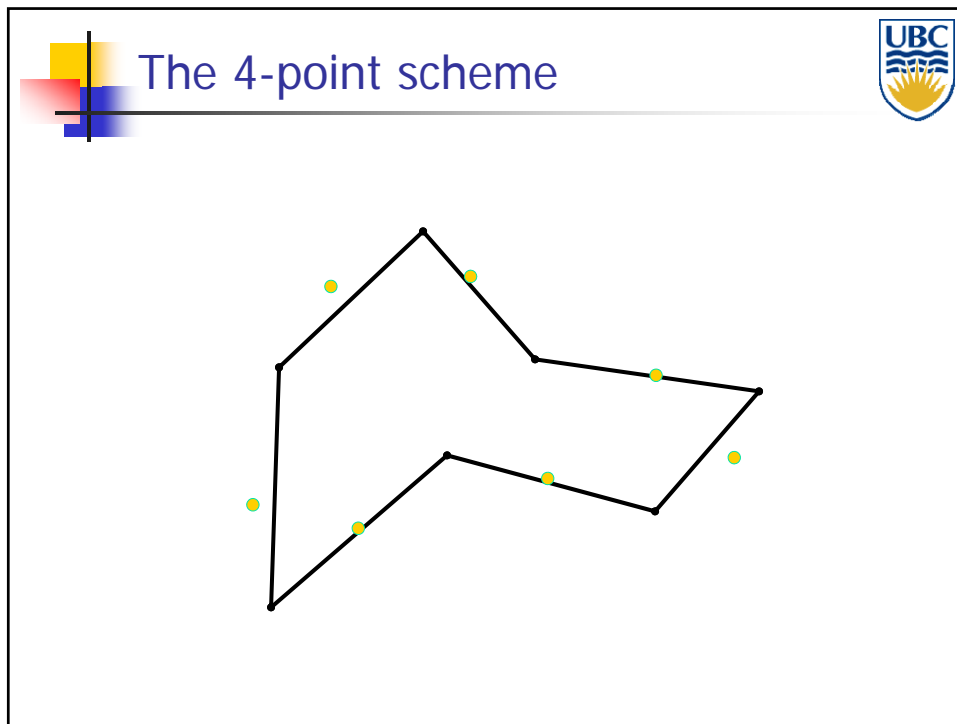


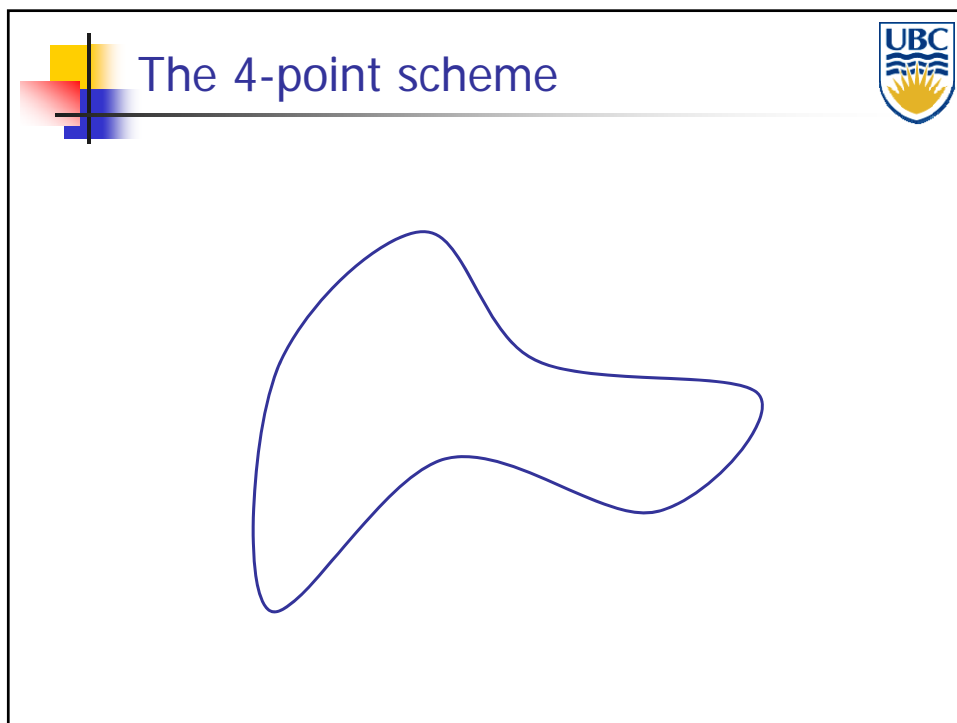
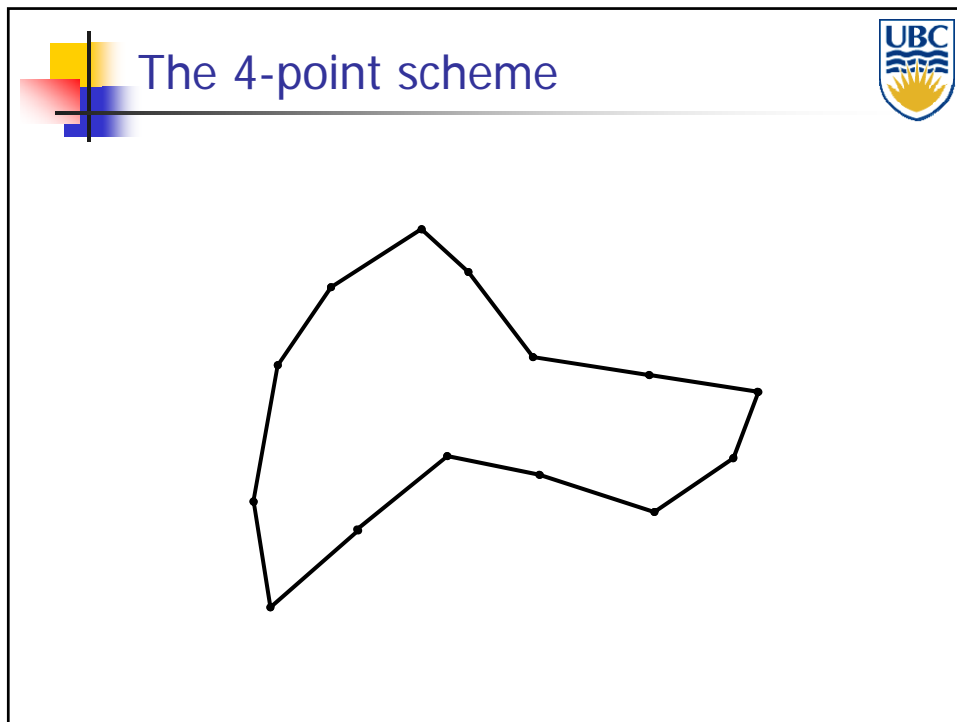


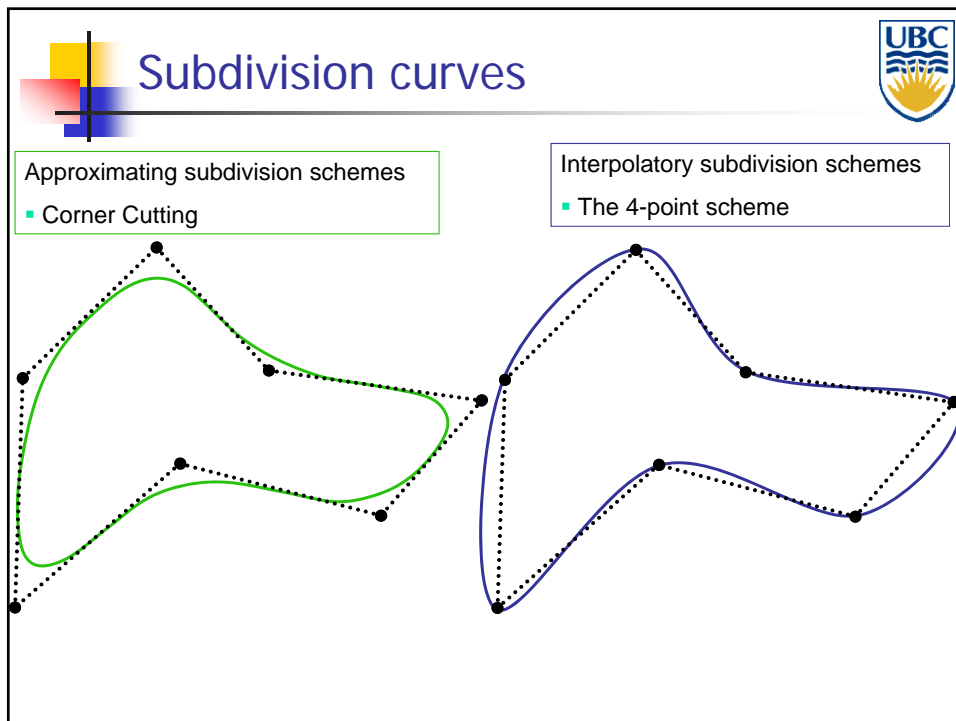
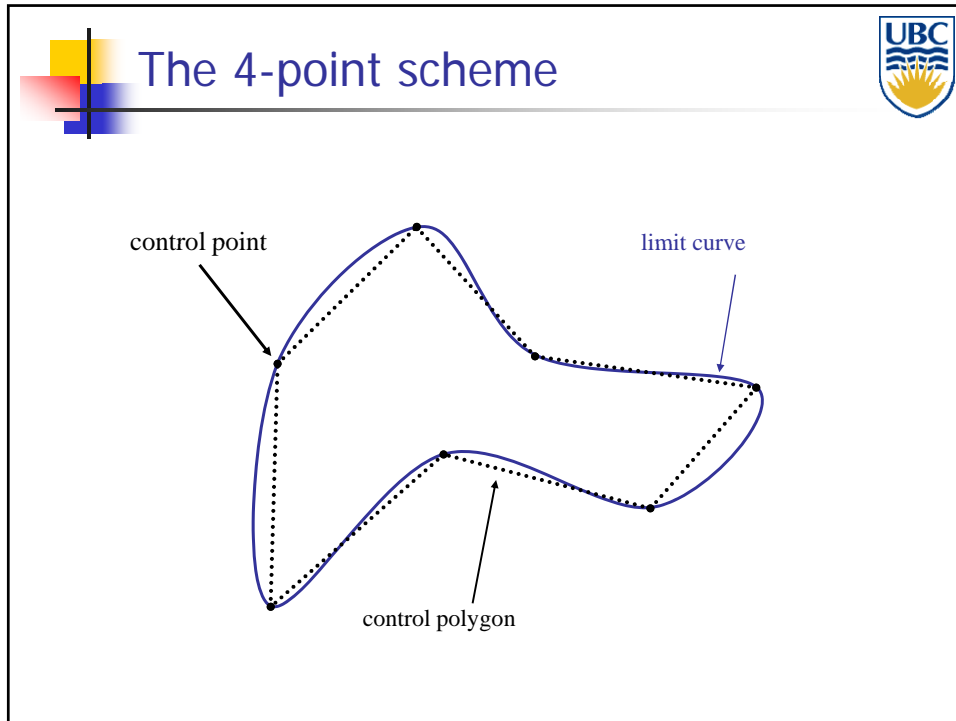


















## Continuity

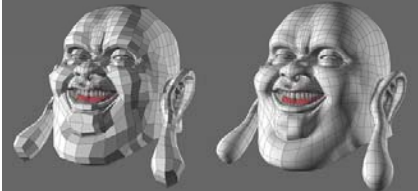


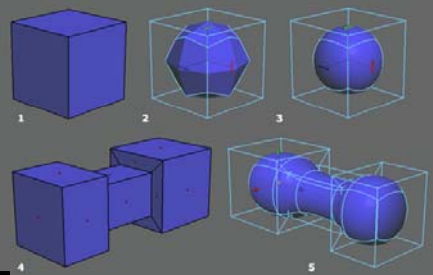
- Continuity
  - Visual “smoothness”
  - Formal: continuity of function + derivatives
    - $C_i$  – where  $i$  corresponds to  $i$ 's derivative
- Continuity of subdivision limit curve
  - Corner cutting–  $C_{inf}$  nearly everywhere,  $C_2$  at a finite number of points
  
  - Four-point scheme –  $C_1$  everywhere

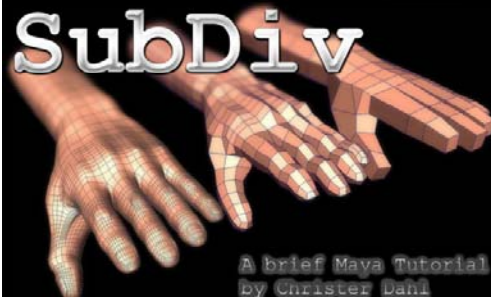


## Subdivision surfaces:









**SubDiv**  
A brief Maya Tutorial  
by Christer Dahl

