

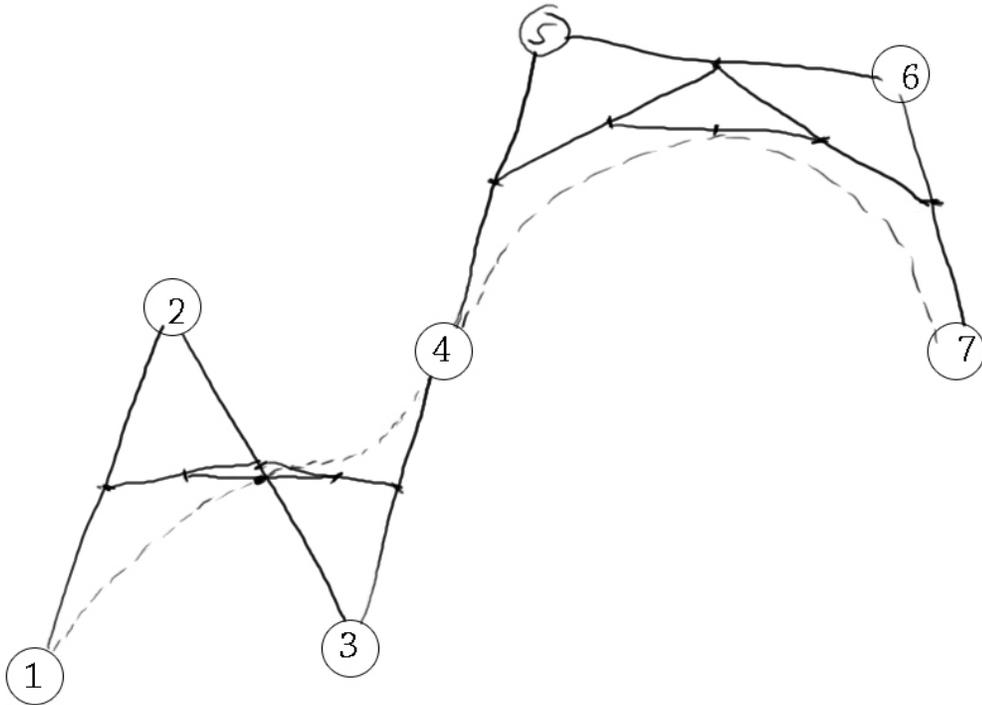
CS 184 - Splines Worksheet - Solutions

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1. Below are control points for two connected segments of a cubic Bezier curve. Point 5 is missing.

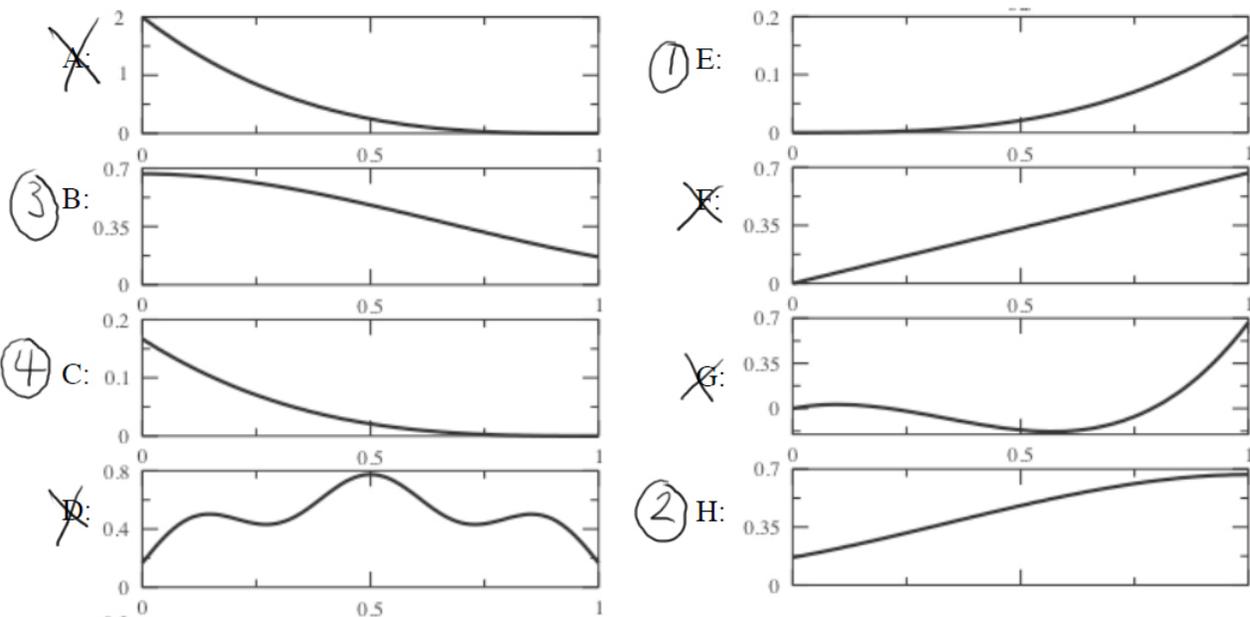
- Place Point 5 so as to join the two segments with C^1 continuity.
- Draw the resulting curve. Show the results of DeCasteljau evaluation at the the midpoints of the two segments.



2. Fill in the following table of properties for three types of curves that we've studied in this class.

Curve Type	Interpolation?	Local Support?	Convex Hull?	Continuity?
Bezier	Endpoints only	Yes	Yes	C^1
Natural	All points	No	No	C^2
B-Splines	None	Yes	Yes	C^2

11. There are 8 functions plotted below. Neatly cross out the ones that are not part of the cubic B-spline basis set. Number the remaining functions to show the order that they go together to form the B-spline "hump" function.



For those that are NOT B-spline basis functions write a single short sentence that explains why they could not be. Your reason should be simple. Note: "It isn't what I have in my notes," "it won't fit," "it doesn't solve the equations," or other generic answers will not be accepted.

Letter	Reason
<u>A</u>	<u>> 1. Violates convex hull</u>
<u>D</u>	<u>Not cubic - too many inflection points</u>
<u>F</u>	<u>Bad endpoint derivatives Will not join up w/ C^2 continuity</u>
<u>G</u>	<u>< 0. Violates convex hull</u>