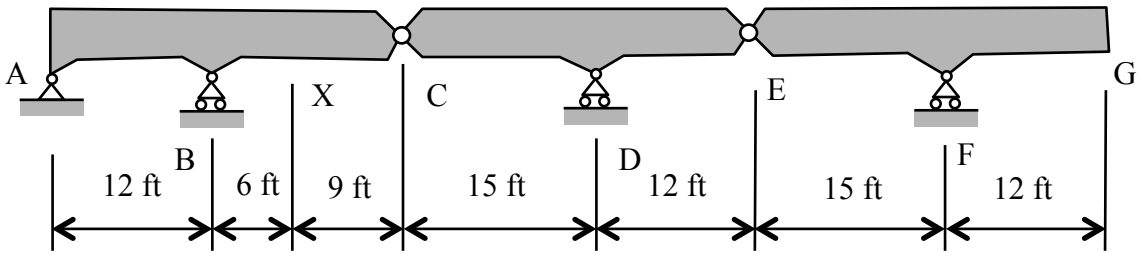
CE 160 Notes: Using the Muller-Breslau Principle to Find the Shape of Influence Lines



For the hinged beam from our review problem, use the Muller-Breslau (MB) Principle to find the shape of the influence line for:

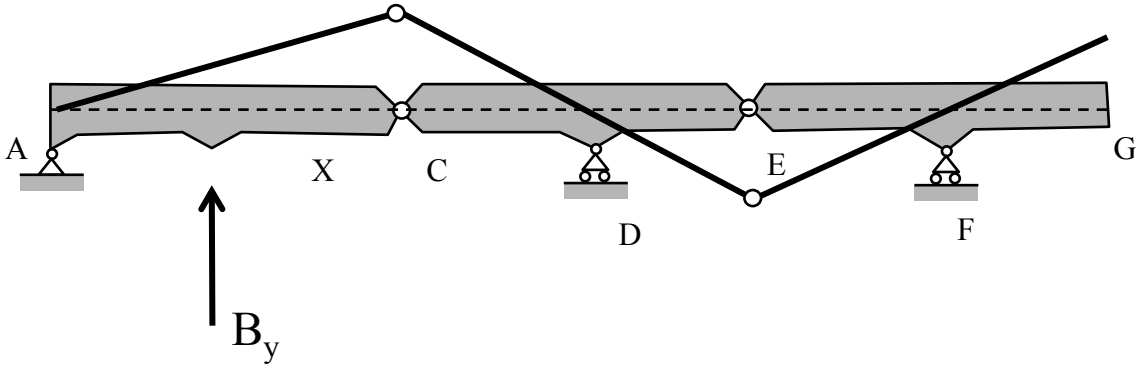
1. The reaction at the roller support at B
2. The internal shear at X
3. The internal bending moment at X

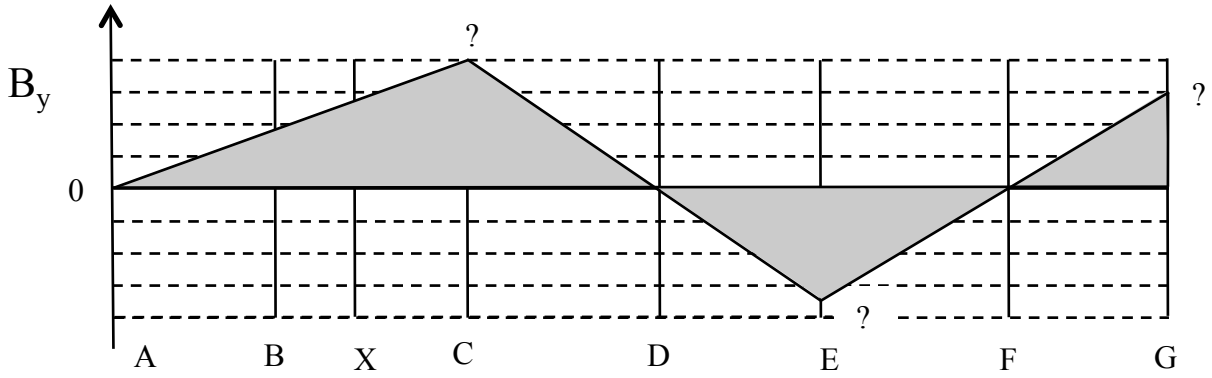
Recall the basic steps to apply the MB principle (remember that this is a thought exercise):

1. Remove the ability for the structure to resist the response quantity (e.g. reaction, internal shear, internal bending moment at a particular point). For a determinate structure this will result in an unstable structure.
2. Apply the response quantity to the modified unstable structure from Step 1.
3. The **rigid body** motion of the modified unstable structure is the shape of the influence line for the response quantity.

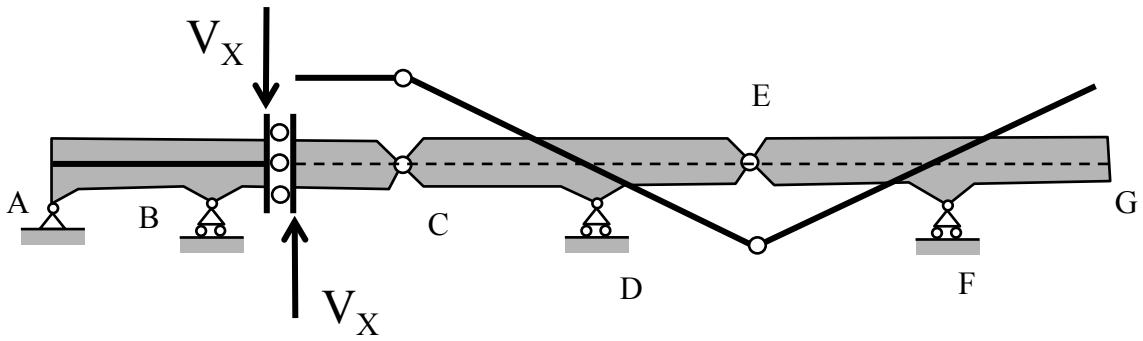
The influence line can then be completed by placing the unit load at appropriate points (based on the shape found in Step 3 above) on the **actual** structure and calculating the response quantity.

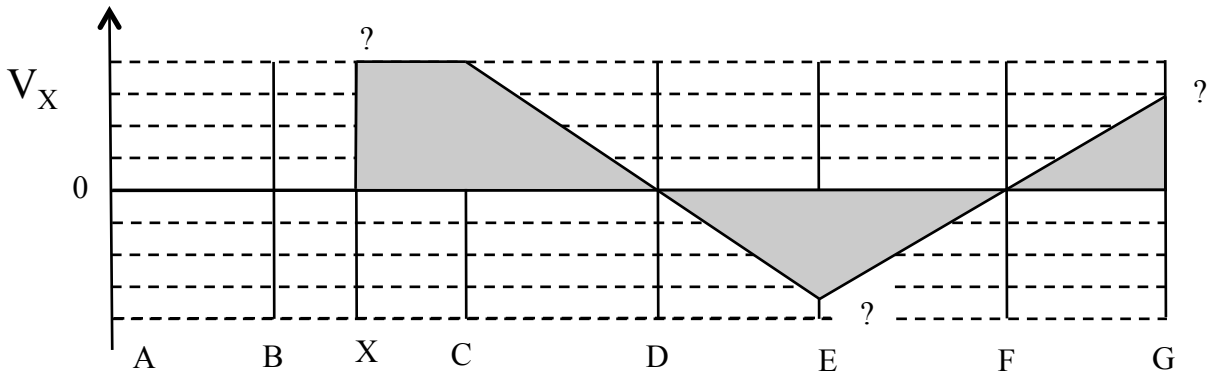
The reaction at the roller support at B:



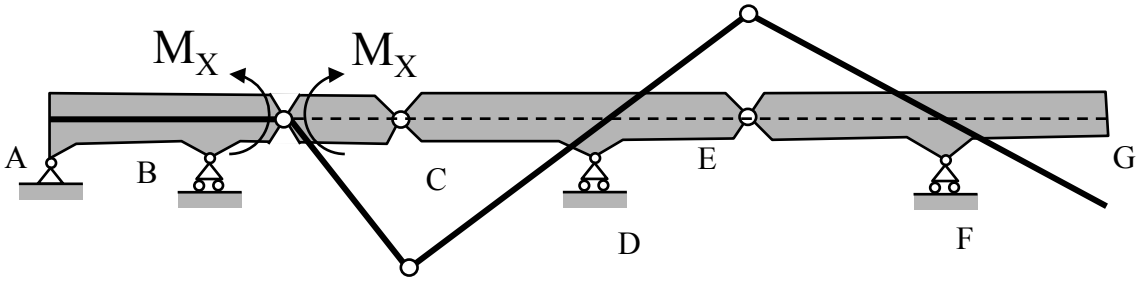


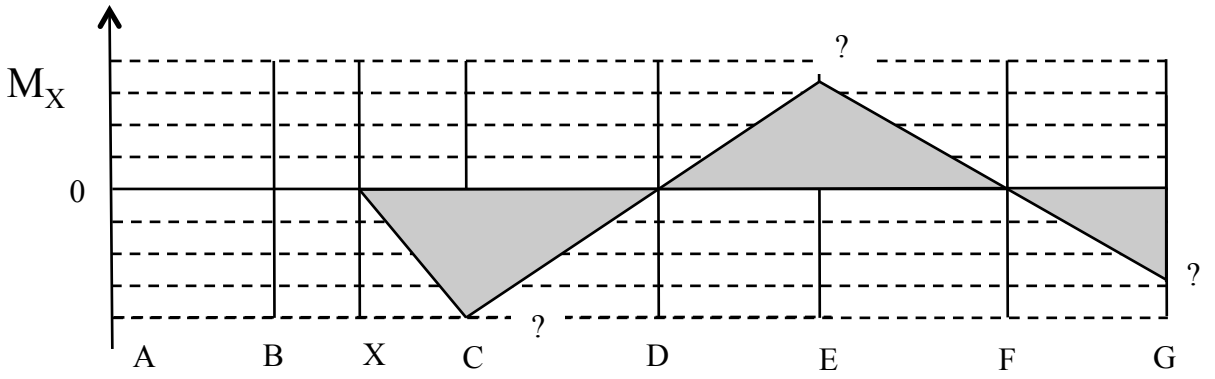
The internal shear at point X





The internal bending moment at X





In lab #8, we will complete each of the three influence lines and we will find: