<u>Creating Bridge in Creo:</u>

1. Use the Datum dropdown menu and select "Curve From Equation."
2. Click the origin ("PRT_CSYS_DEF") to set a reference for the curve equation.
3. Click Equation in the upper left corner and copy paste:
   Height = ""
   Span = ""
   X = (span/2) * cos(t*180)
   Y = (4*height/span^2)*X^2

   **** The "" symbols represent areas where you in input your own values. Play around with these values to construct a parabola that suits the height and width you are looking for.
4. Then click the check mark.
5. Click on your curve and then select the sweep tool. In the upper left corner, choose the third option from the right titled "create or edit sweep action."
6. Then select the circle tool and make its center on the red X to the right of the origin. Choose any value you would like for the radius here. Click check mark.
7. In order to make the bridge stand flat, we must create a new plane to cut straight through the legs of the arch. Make it parallel to the horizontal plane with whatever offset you see fit.
8. Then use the extrude tool on that plane. Create a rectangle that clears the full area of the arch and use the remove material option. Make sure it is removing material in the direction you intended. You should then have an arch with flat bottoms capable of standing on its own.

This next portion is for creating holes for beams through the arch

9. You should begin by deciding how many holes you want. The amount of planes you will make will be the number of holes you choose divided by 2 (assuming you choose an even number).
10. For this example, lets use 4 holes, meaning we need to construct 2 planes. These planes should be horizontal and parallel to the previous plane constructed. The goal is to offset them in such a way so that you can construct two holes per plane. You want the holes to be placed in the right place of the arch so you should play around with the offset of the planes so that you can make equidistant holes but still make them occur on the right place of the arch.
11. In order actually make the holes, you have to extrude and choose **the vertical plane** that goes through the origin. The other planes we just made are only going to be used as references
12. Use the references tool to make the planes from step 10 references so you can place the holes where you want to.
13. Make the holes whatever radius you please and when you are satisfied with its placement (you can adjust the dimensions so that everything is

equidistant from certain references), click remove material. This will create the holes.

14. You can then use the extrude tube to make a cylinder coming out of each hole with a radius larger than the hole. After we will use the extrude tool again to cut a hole in this cylinder the size of the hole, basically creating a tube on the arch. Follow these steps and then continue.

*Note: make the distance you extrude the tube half the distance of what you actually want it to be when assembled, because when you assemble the two arch components together, they will each contribute a half.

15. Finally using an assembly and you knowledge of constraints, assemble two copies of your piece together to put together a final bridge composed of two arches connected by tubes.