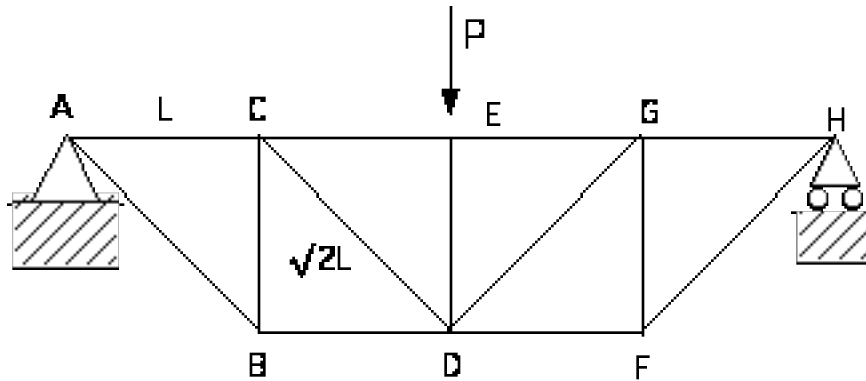


Problem M8 (Materials and Structures)

For the truss shown below (and analyzed in M7) calculate the deflection of point D under the loading shown. The bars have length L or $\sqrt{2}L$ and all angles are either 90° or 45° . The bars have cross-sectional area A and they are made of a material with Young's modulus E . **Hint**, draw a displacement diagram starting at points E and D – what can you say about the displacement of D relative to E given that this is a symmetric structure?.



Since this is the truss that you are experimenting with in the truss lab, you can also compare the results of the experiments to the analysis. By assuming values for L , A and E (70 GPa for aluminum, 210 GPa for steel) estimate the relationship between applied load and the deflection of point D for the experimental truss and compare with your data. If the two results are not similar, suggest potential reasons for the discrepancy.