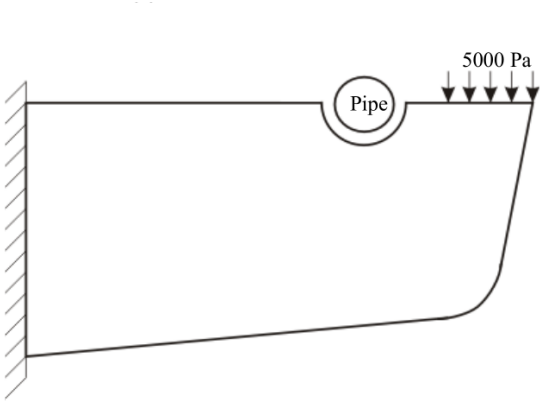
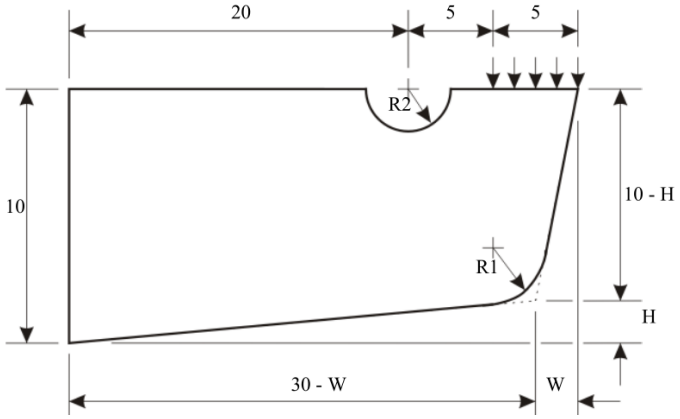
Bracket Optimization Homework Tips

Given Bracket Geometry





Range of Dimensions

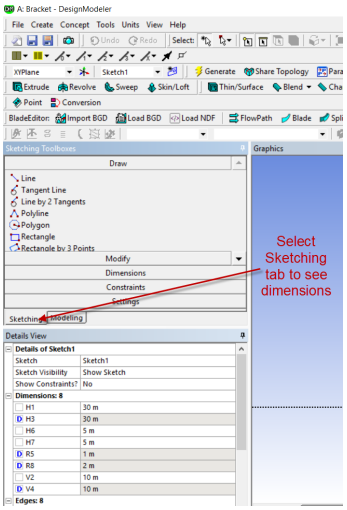
Table 1: Initial bracket dimensions and their limits

Parameter	Initial value [m]	Lower limit [m]	Upper limit [m]
H	0	0	5
R1	1	0	5
R2	2	1.5	5
W	0	0	5
Out of plane thickness	0.3	0.25	0.5

Geometry Download

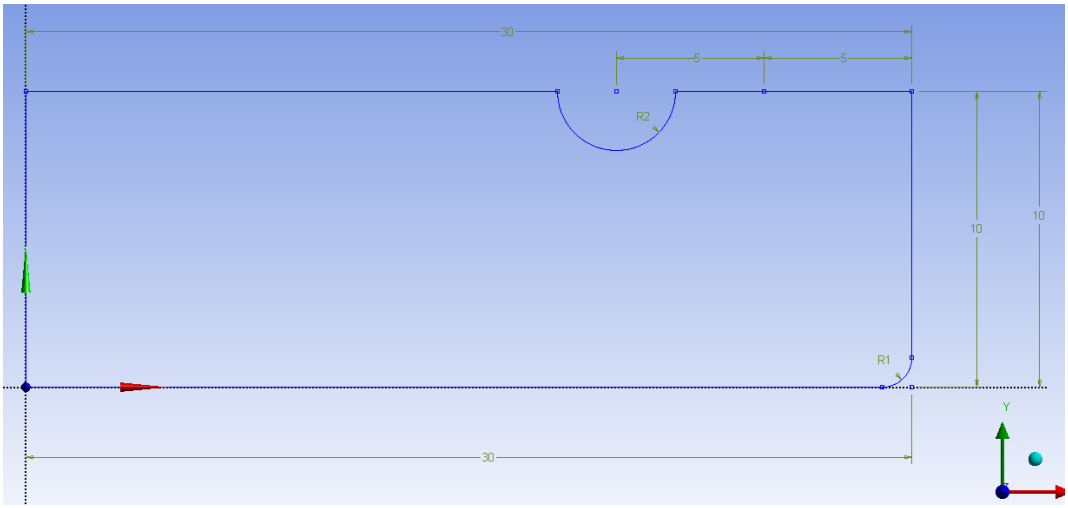
Since this problem has not been tested with SpaceClaim, we are providing you with the parameterized geometry created in DesignModeler, the older geometry engine in Workbench. Click on the link below to download the geometry. FYI, if you double-click on the Geometry cell in Workbench, it will open up the geometry in DesignModeler and selecting the Sketching tab (see snapshot below) shows the dimensions. The parameters have already been specified in DesignModeler so you do not need to worry about specifying anything in DesignModeler. The rest of the parameters can be specified from Mechanical. Make sure to specify the ranges of the parameters used for the optimization as per the tip below.

Download geometry file in wbpz format



Creating Initial Dimensions in ANSYS

You cannot have the value of dimensions go to zero in ANSYS. So do not explicitly create the dimensions W and H. Instead, while sketching the initial geometry, create the dimensions 30-W and 10-H with W and H equal to zero as per the snapshot below. In the Design of Experiments step, specify the limits for the lower edge (i.e. the one labeled 30-W in the above figure) as 25m to 30m (corresponding to W varying from 5m to 0m). The edge labeled 10-H can be handled in a similar fashion. Note that the bounds for R1 and R2 need to be modified slightly as well: R1 should have a lower limit of 0.01m and R2 should have an upper limit of 4.99m, otherwise an error will likely occur.



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