

# 2D Beam - Geometry

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## Geometry



For users of ANSYS 15.0, please check [this link](#) for procedures for turning on the Auto Constraint feature before creating sketches in DesignModeler.

We'll first create a sketch and then a "surface body" from the sketch. The "surface body" is nothing but an area that we can mesh and apply boundary conditions to. The video below shows the steps to be followed to create the sketch and surface body.

Summary of steps in the above video:

1. In Workbench, right click on Geometry Cell A3. Select Properties.
2. Under Property > Advanced Geometry Options > Analysis Type, select 2D. Close Properties of Schematic A3.
3. Double Click on Geometry in cell A3 to start a Design Modeler session.
4. Click on Inch in the dialog box that pops up upon starting Design Modeler.
5. To create a sketch in the XY Plane:
  - a. Highlight XYPlane in the Tree Outline.
  - b. Select Look At Face/Plane/Sketch to change the view in the graphics window to that of the highlighted XYPlane.
  - c. Click on Sketching tab.
  - d. Under the Draw toolbox, select Rectangle.
  - e. Hover mouse around origin until 'P' appears, which means that the mouse pointer is coincident with the origin. Hold down left mouse button and draw a rectangle in the (+x, +y) quadrant.
  - f. Click on the Dimensions toolbox. With General selected, click on the sides of the rectangle to create dimensions.
  - g. In Details View, change the length to 100in and the height to 8in in accordance with the problem specification.
6. To add points to the baseline geometry for later application of a point load:
  - a. Under the Modify toolbox, scroll down the list of options. Select Split.
  - b. Hover pointer over one of the horizontal edges. Click on edge to split it (anywhere). Do the same for the lower horizontal edge.
  - c. Under Constraints toolbox, scroll down the list of options. Select Equal Length.
  - d. Select first line for equal length constraint (on top horizontal line, to the left of the newly created point). Then select the second line for equal length constraint (on bottom horizontal line, to the left of the newly created point).
  - e. Click on the Dimensions toolbox. With General selected, click on one of the newly constrained edges to create a dimension.
  - f. In Details View, change the length to 75in in accordance with the problem specification.
7. To create an area from the sketch:
  - a. Select Concept > Surfaces from Sketches.
  - b. With the Edge selection tool, select any one of the edges on the sketch.
  - c. In Details View > Base Objects, select Apply.
  - d. Click Generate.
8. Save Project.

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