

15-294 Rapid Prototyping Technologies:

Certified SolidWorks Associate Exam, Part 2

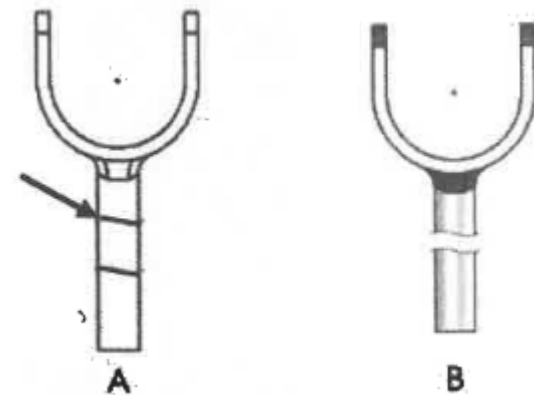
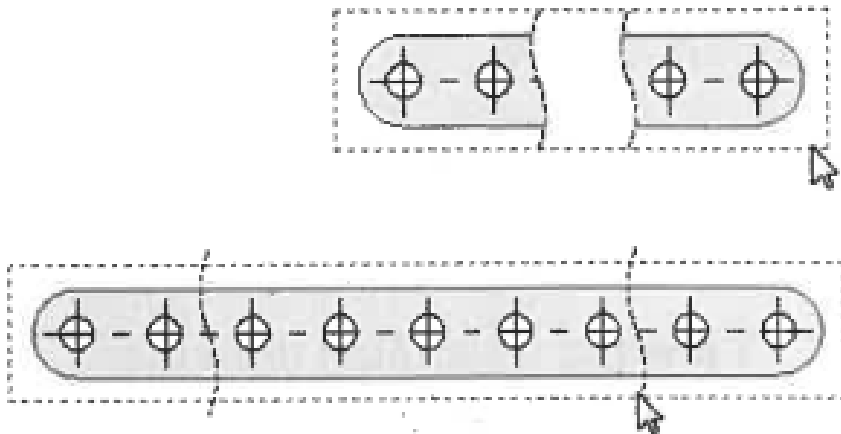
Dave Touretzky
Computer Science
Carnegie Mellon University

Drawing Competencies

- Identify different types of drawing views.
- Identify what kind of entity was used to construct a view (e.g., edge, closed spline, etc.)

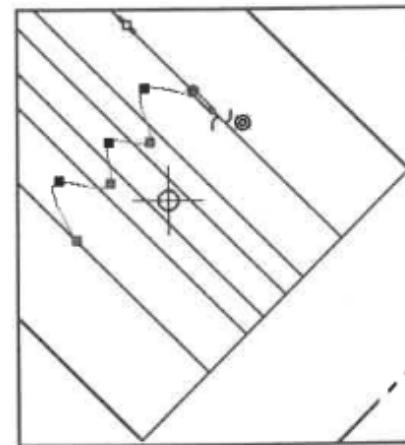
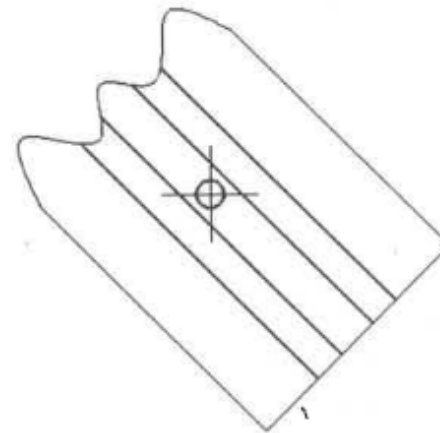
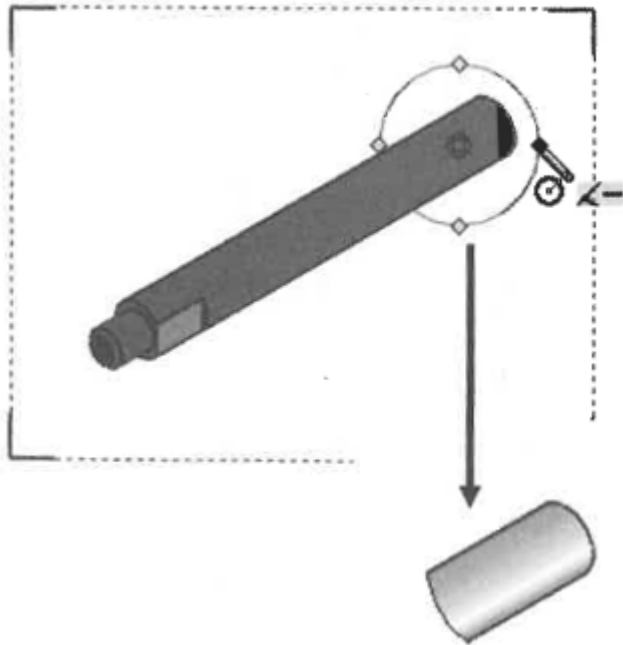
Breaks

Draw two lines or curves to indicate the boundaries of the break.



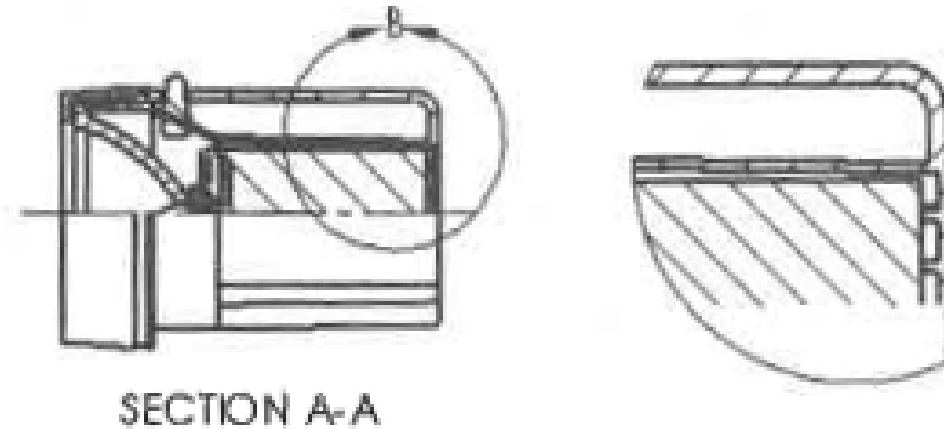
Cropped View

Draw a closed boundary to crop the image.



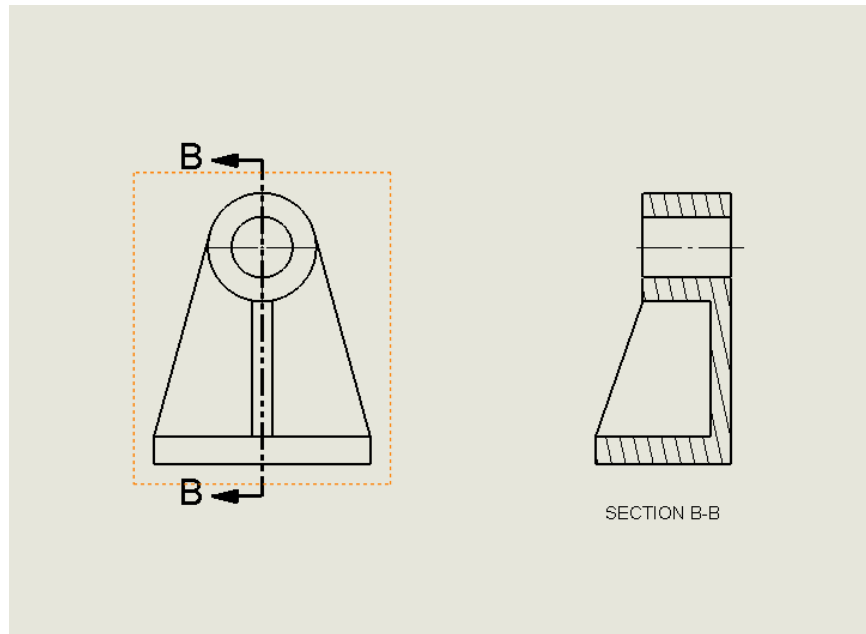
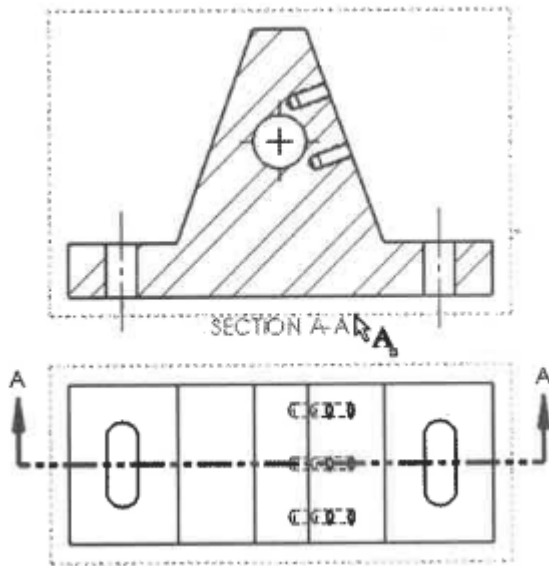
Detail View

Specify a boundary to zoom in on. Similar to crop, but also changes the scale.



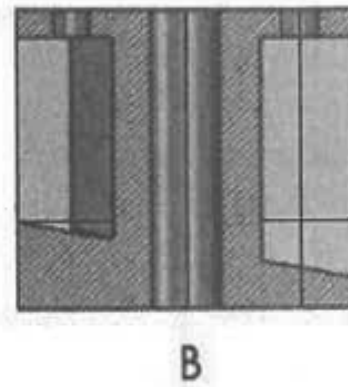
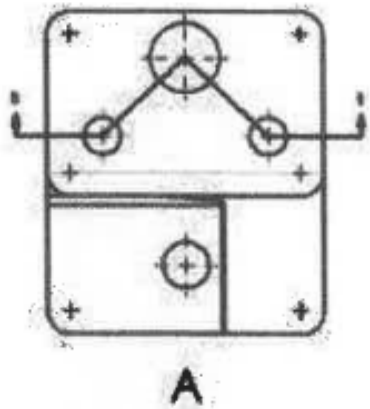
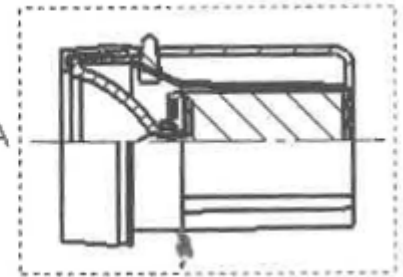
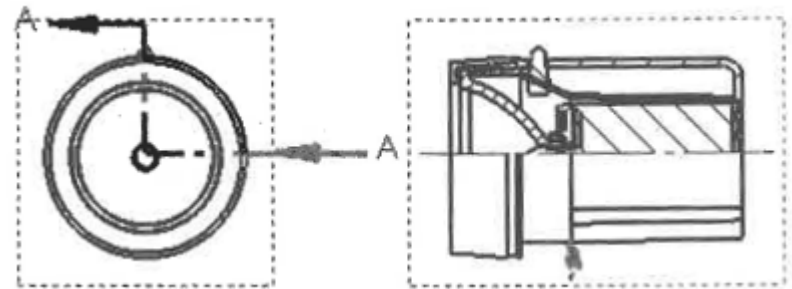
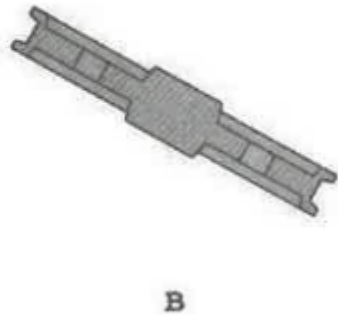
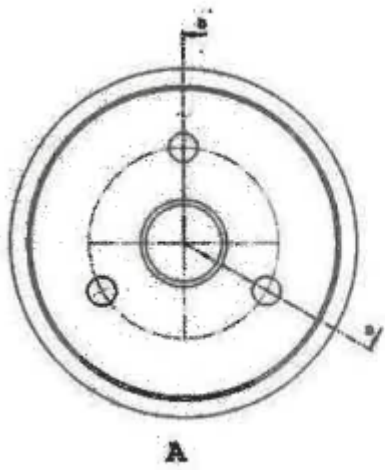
Section View

Specify a plane for cutting the object.



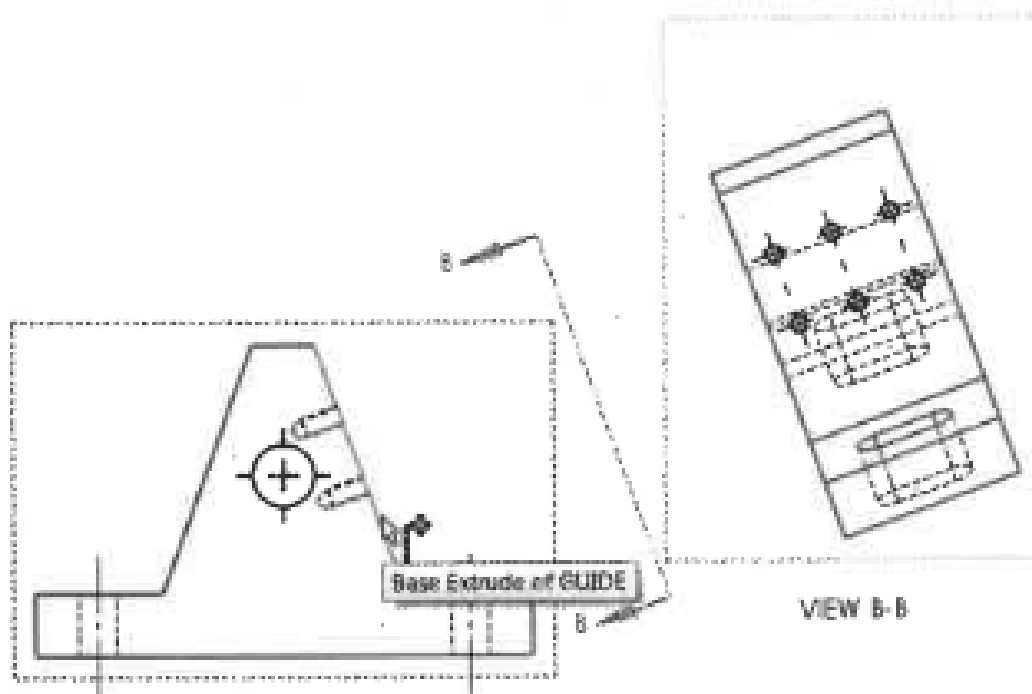
Aligned Half-Section View

Cutting boundary need not be a straight line; rotates the view to the plane of the boundary.



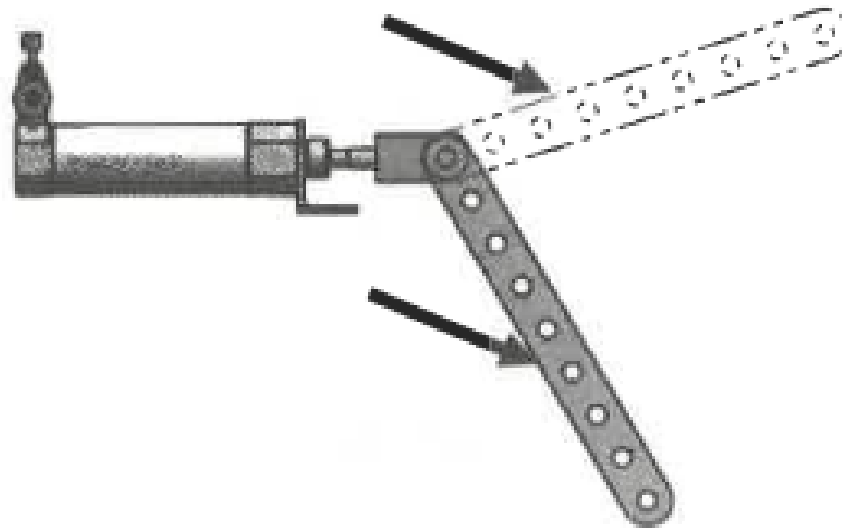
Auxiliary View

Specify an edge to align the view.



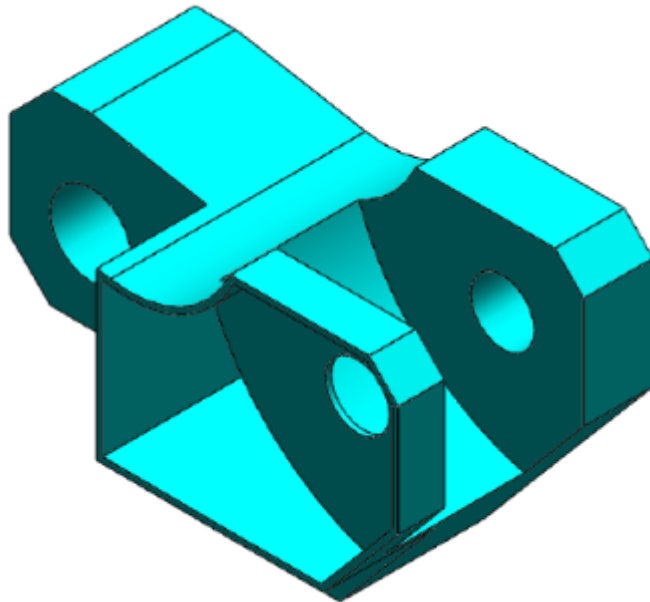
Alternate Position View

Used for assemblies with moving parts.



Exercise

- Download the part Hunk3.SLDPRT (linked from the class schedule).
- File > Make Drawing From Part
- Try constructing different views.



Assemblies

Given these parts (see link from class schedule), make the assembly.

Unit system: MMGS (millimeter, gram, second)

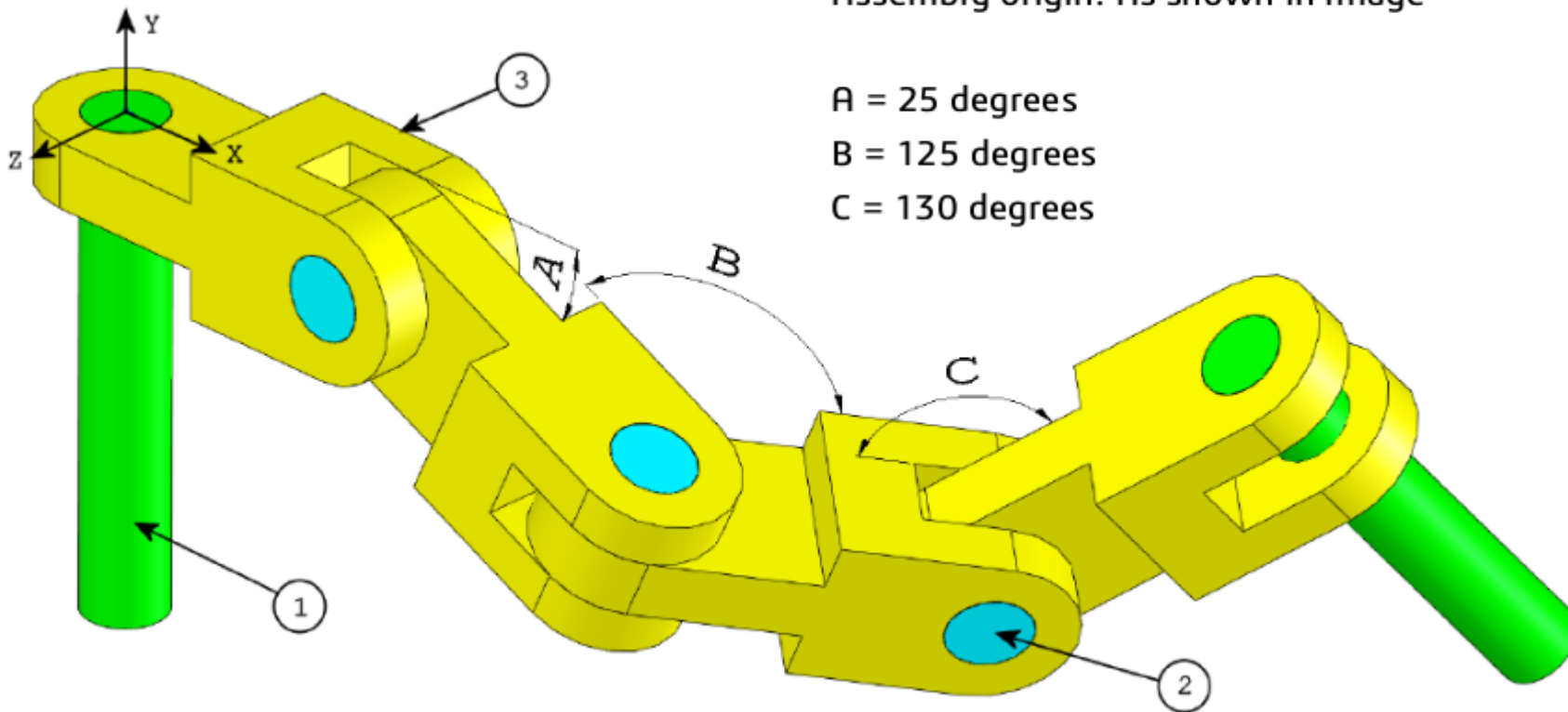
Decimal places: 2

Assembly origin: As shown in image

A = 25 degrees

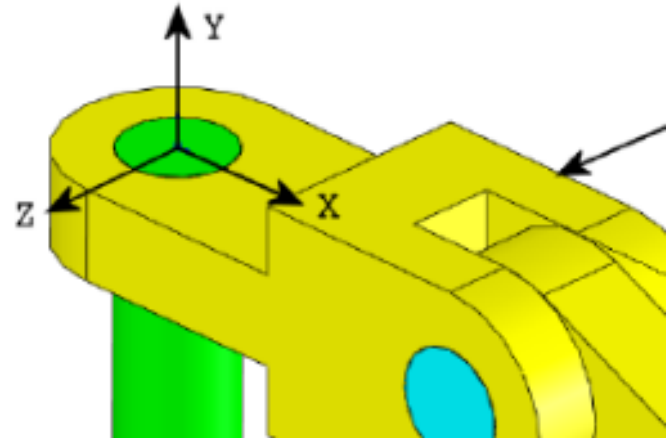
B = 125 degrees

C = 130 degrees



Setting the Origin

- Note that the origin is at the center of the top face of the first long pin.



- Open the part in the feature manager tree and you can see its Top, Right, and Front planes.
- Mate these planes to the assembly's planes.

Find the Center of Mass

- These parts already have material assigned.
- Use mates to put them into the correct positions.
- What is the center of mass (within 1%)?
 - a) $X = 348.66, Y = -88.48, Z = -91.40$
 - b) $X = 308.53, Y = -109.89, Z = -61.40$
 - c) $X = 298.66, Y = -17.48, Z = -89.22$
 - d) $X = 448.66, Y = -208.48, Z = -34.64$

Change of Coordinate System

- The exam may ask you to change coordinate systems and then recalculate the center of mas.
- Go to Features > Reference Geometry and add a Coordinate System feature.
 - Specify a point for the origin
 - Set the alignment of the axes.
- In the Evaluate tab, under Mass Properties, you can select which coordinate system to use.