

**TERMS TO BE DEFINED OR IDENTIFIED FOR COMPETENCY 8:**

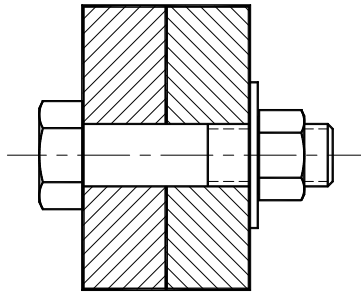
- Section lines
  - Material types
- Revolved section
- Cutting-plane line
- Full section
- Aligned section
- Offset section
- Broken out section
- Removed section
- Conventional breaks
- Auxiliary sections
- Outline sectioning

**ITEMS TO BE REVIEWED for COMPETENCY 8:**

- Function of a section view
  - Show complicated interiors
  - Visible edges behind cutting plane line to be shown
  - Hidden lines generally omitted.
- Function of the cutting plane line
  - Location of cut
  - Reveal interior details
  - Identify line of sight
- Basic rules
  - Hidden lines not shown
  - Visible edges behind cutting plane line shown
- Explain the application of section lines
  - Cast iron, .125" uniformly spaced thin lines, is the general-purpose section line.
  - Section lines should all be at the same angle for a single part. Section lines at different angles on the same drawing indicate more than one part.
  - Section lines should not be drawn vertical, horizontal or parallel to an adjacent object line of the drawing.
  - Section lines can identify the general class of material such as steel, brass or rubber.
  - Thin items such as gaskets or sheet metal are shown un-sectioned.

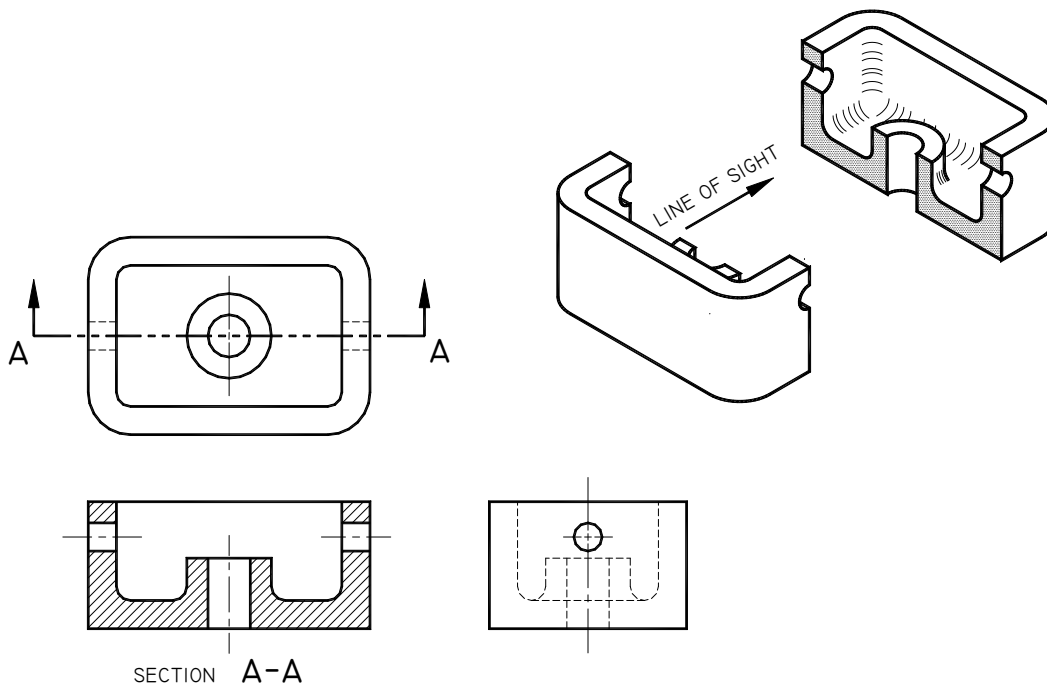
### Types of features that are not sectioned

- On an assembly section, items that are not sectioned include; **shafts, bolts, nuts, rods, rivets, keys, pins, screws, gear teeth, spokes, etc.**



### Full Section

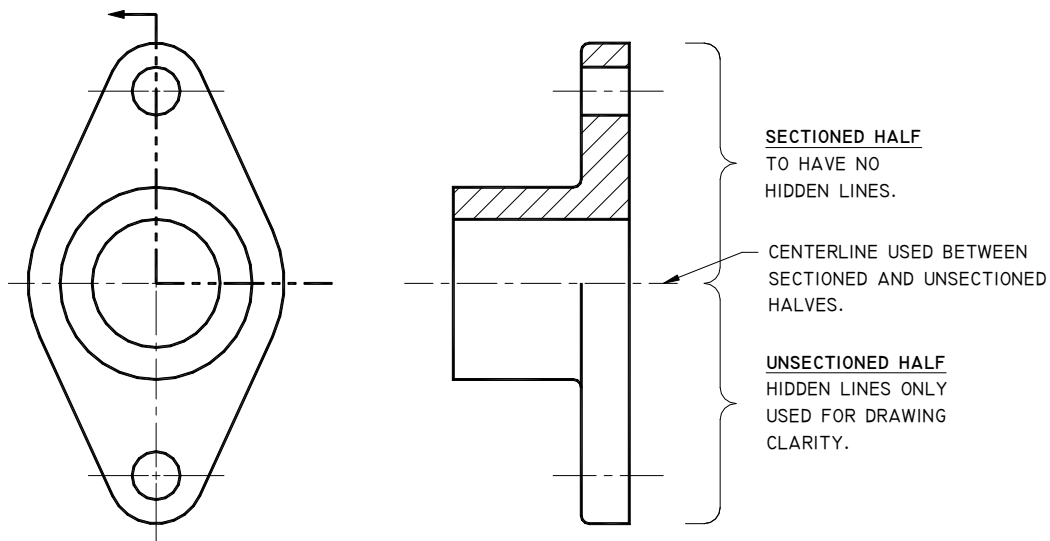
The cutting plane line extends straight through the object, generally at the centerline of symmetry.



## Half Section

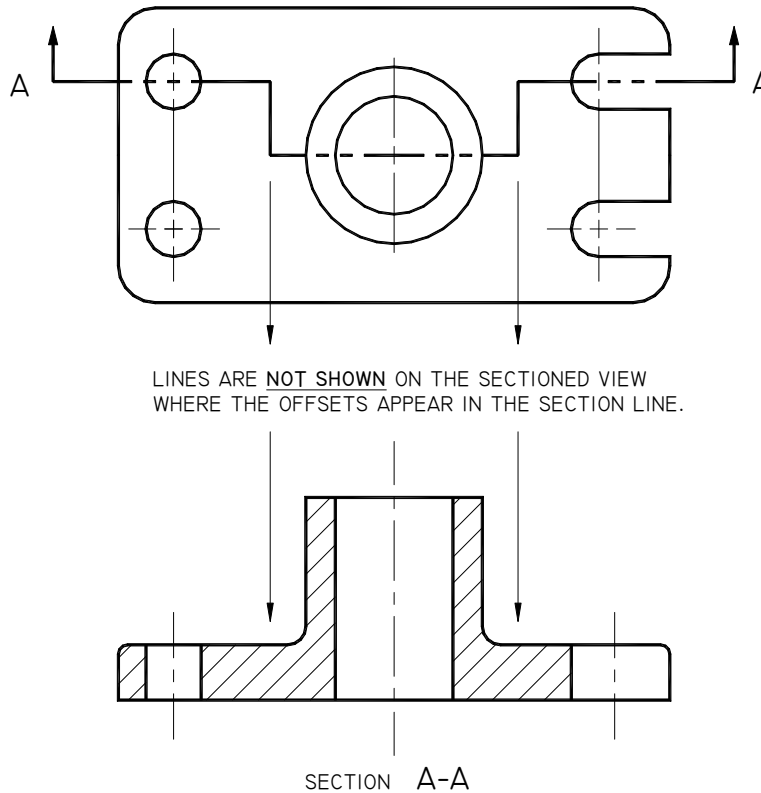
The cutting plane passes half way through the object, removing one fourth of the object.

- Half sections are most applicable to symmetrical objects to show both the interior and exterior in a single view.
- A centerline is used between the sectioned and the unsectioned half.
- Frequently used for assembly drawings.



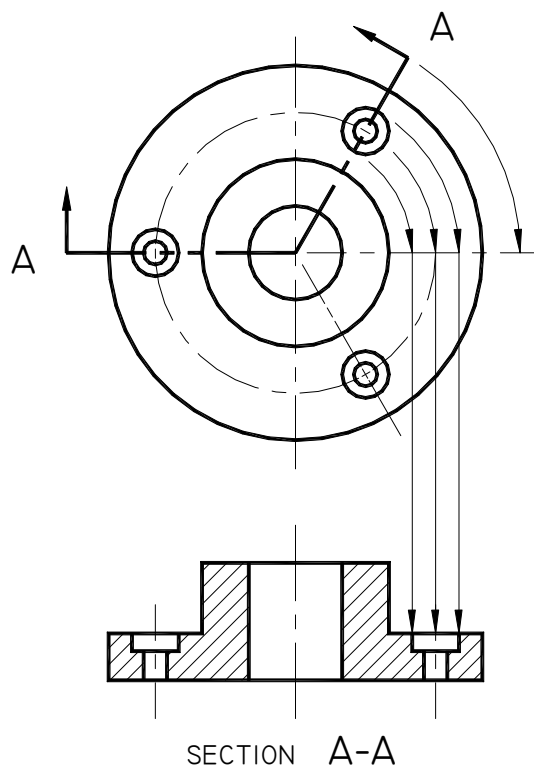
### Offset Section

To include features that do not appear in a straight line, the cutting plane may be offset to pass through the features. Offsets or bends created by the cutting plane are not shown on the section view.



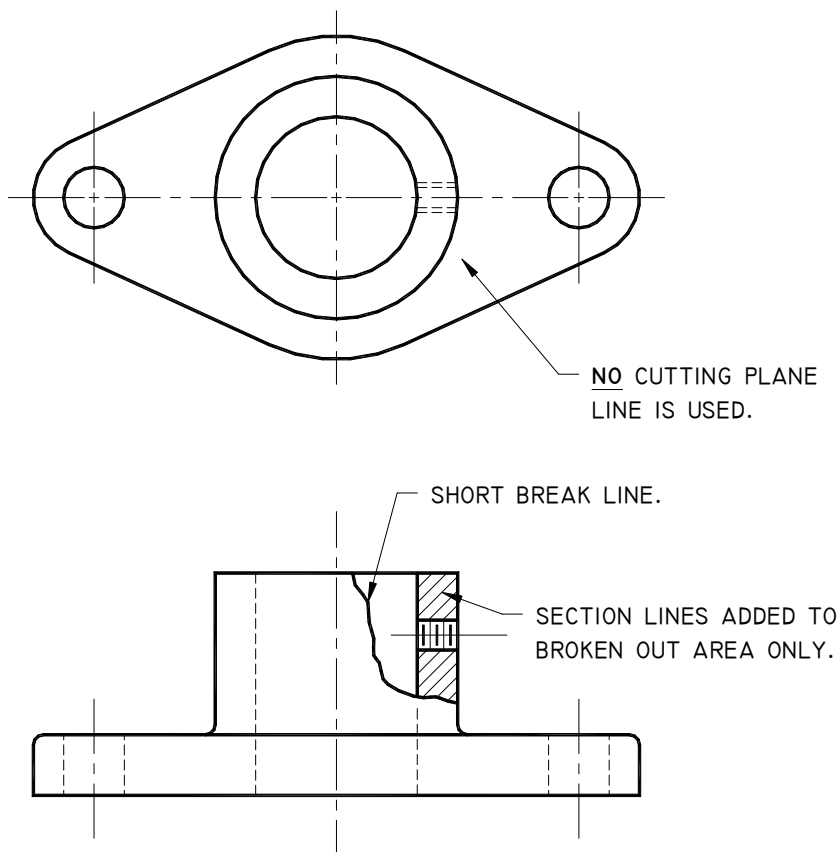
### **Aligned Section**

The cutting plane is offset to pass through features that are then rotated into a plane perpendicular to the line of sight of the section view.



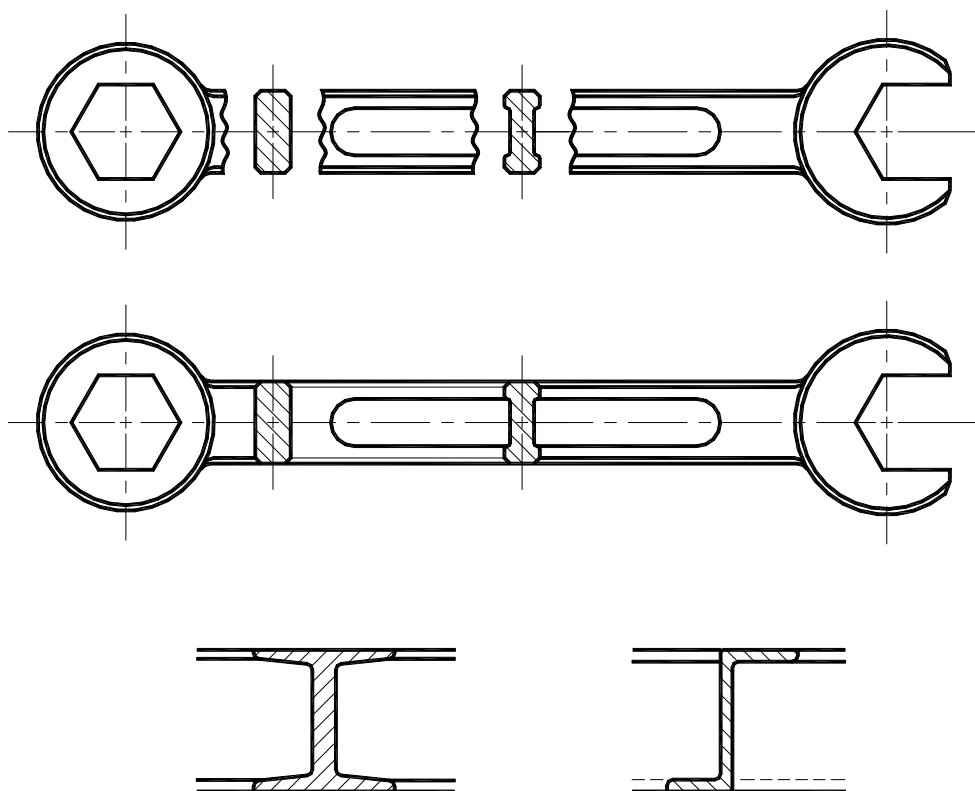
### Broken-Out Section

Where only a portion of the object needs to be shown in the section. The section is limited by a short (freehand) break line. No cutting plane line is required.



### Revolved Section

A cutting plane line is passed through the object and revolved 90° in place towards the plane of the drawing. Used to show the cross section of a spoke, bar, rib, etc.

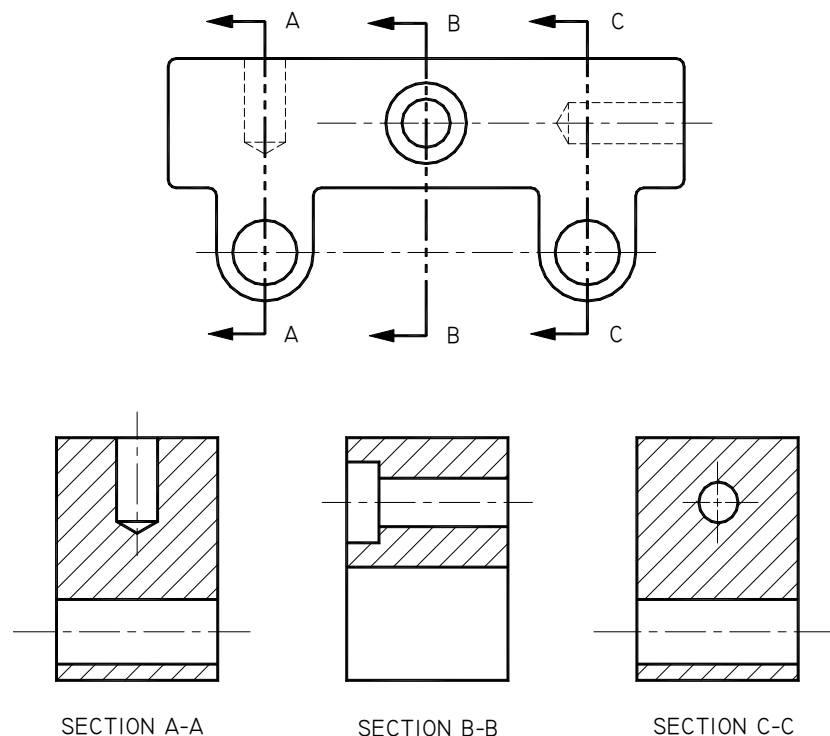


### Removed Section

A section that is not a direct projection from the view with the cutting plane. The section view is generally moved from its normal projection position, but must remain in its true orthographic orientation.

- Removed sections are often drawn at a scale different from the view it was taken from.

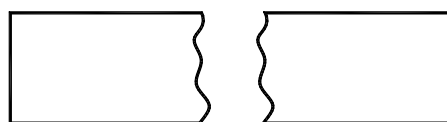
Center lines may extend from the imaginary cutting plane to the removed section provided it is symmetrical.



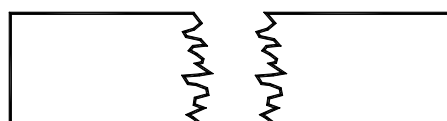


### Conventional Breaks

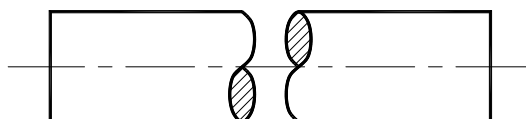
Used to shorten long features.



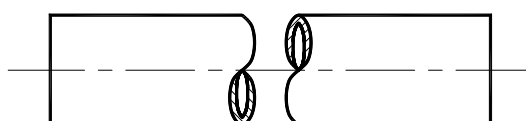
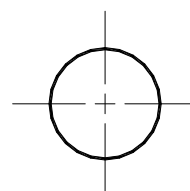
BAR



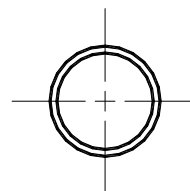
WOOD



ROD

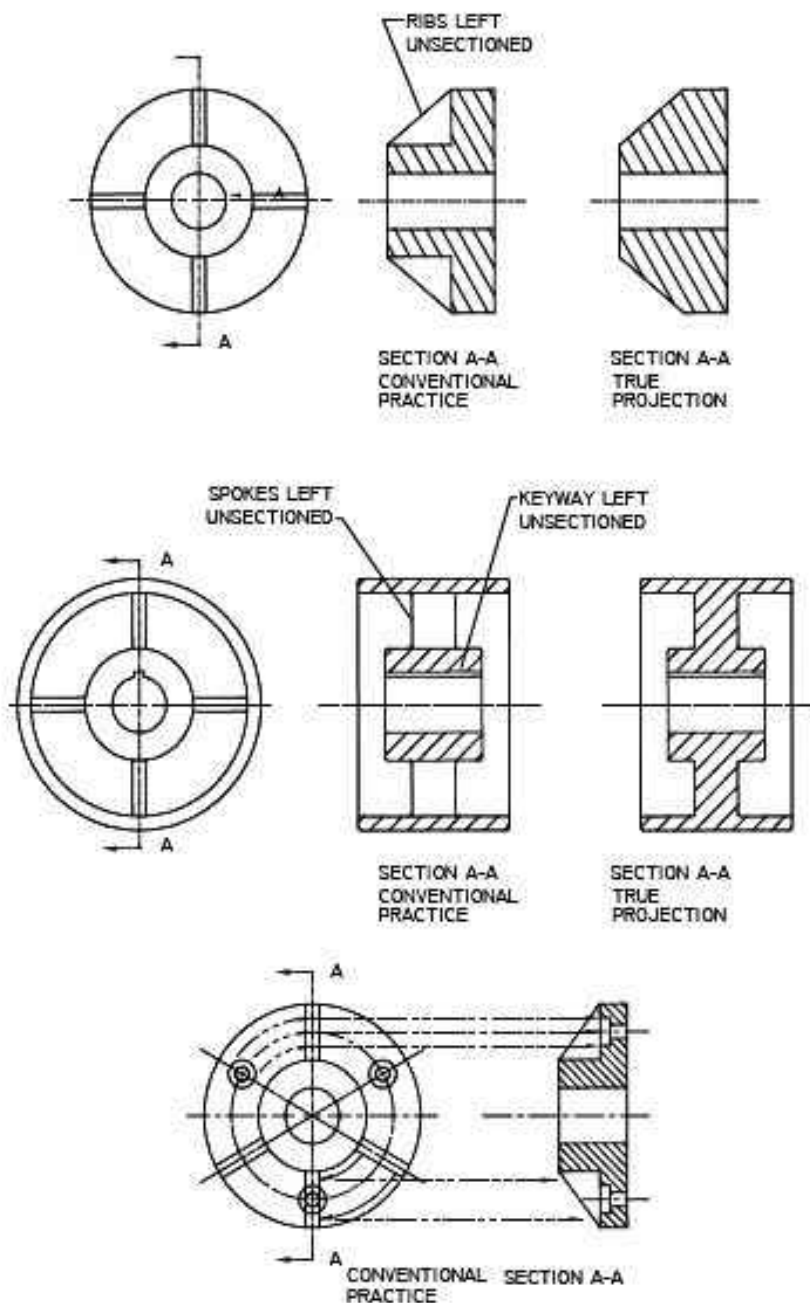


TUBE



### Ribs/Web/Keyways

Webs, ribs, gear teeth and other like features are not sectioned to avoid giving a false impression of the parts thickness.



**SAMPLE REVIEW QUESTIONS**

1. Removed sections, generally are not placed in direct alignment with the cutting-plane line.  
True  
False
2. Conventional breaks are used when a long object of constant shape needs to be shortened.  
True  
False
3. Cutting plane lines never take precedence over any other line.  
True  
False