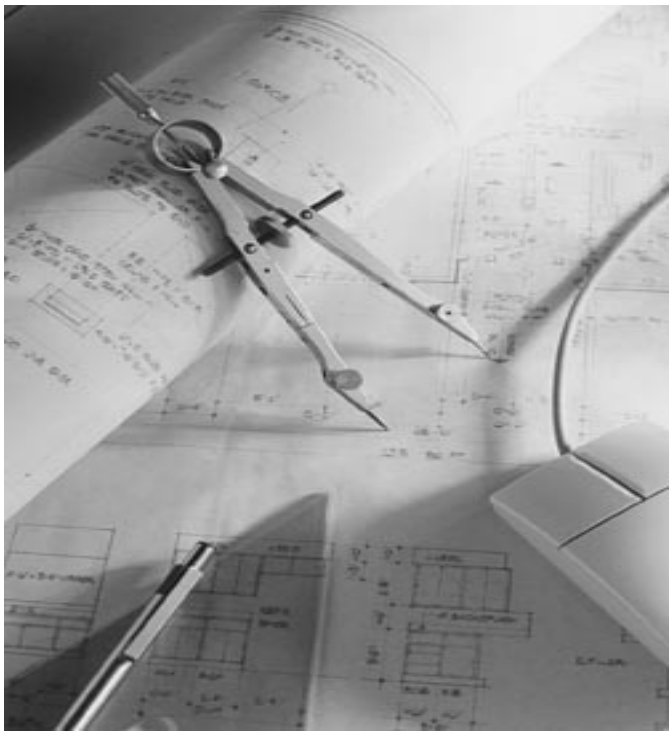
Autodesk AutoCAD 2004:

Mechanical Drafting for Beginners



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Lesson 2
Polylines

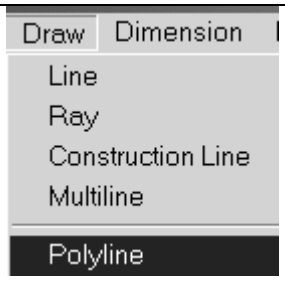
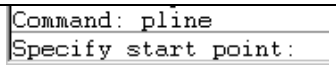
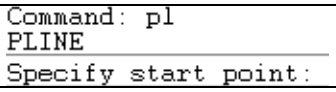
Learning Objectives:

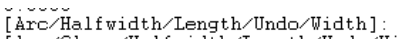
- Polyline
- Polyline edit

Primarily, GIS drafters and architects use polylines. Mechanical drafters use polylines to create drawing borders, arrows and cutting plane lines. Cutting plane lines are used for section views.

A polyline is similar to a line but it can have thickness. Additionally, you can "join" or connect more than one line to create a single object. Polylines can have varying thickness or widths.

Polylines can be created four ways:

Menu: Draw-> Polyline	
Draw Toolbar	
Command line: pline	
Shortcut: pl	

The polyline command has several options:	
	
Arc	Creates Polyarc
Halfwidth	Specifies half the width of the polyline
Length	Specifies the length of the polyline segment
Undo	Undoes the last point selected
Width	Specifies the width of the polyline

You can draw your object using lines and arcs and convert it to polyline using the polyline edit command. You can convert polylines and polyarcs back to lines and arcs using the EXPLODE command.

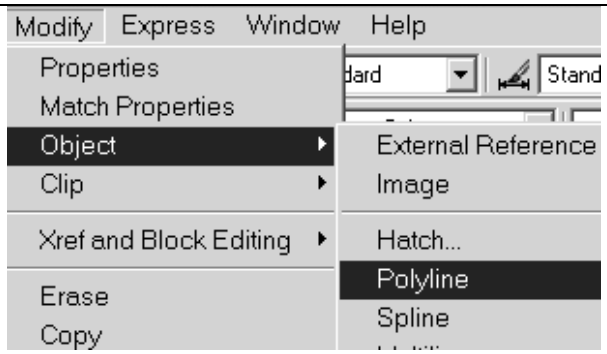
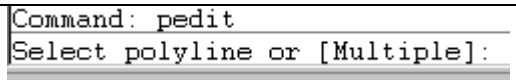
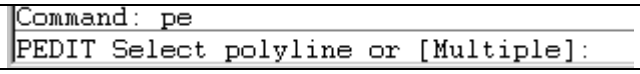
TIP: The PLINEGEN system variable controls the linetype pattern display around and the smoothness of the vertices of a 2D polyline. Setting PLINEGEN to 1 generates new polylines in a continuous pattern around the vertices of the completed polyline. Setting PLINEGEN to 0 starts and ends the polyline with a dash at each vertex. PLINEGEN does not apply to polylines with tapered segments.

PLINETYPE controls both the creation of new polylines with the PLINE command and the conversion of existing polylines in drawings from previous releases.
0 Polylines in older drawings are not converted when opened; PLINE creates old-format polylines
1 Polylines in older drawings are not converted when opened; PLINE creates optimized polylines
2 Polylines in older drawings are converted when opened; PLINE creates optimized polylines

The CONVERT command can be used to optimize polylines created in AutoCAD R13 or earlier.

Sometimes it is easier for the beginner drafter to create the geometry using standard lines and arcs and then convert the geometry into polylines and polyarcs. To change a regular line to a polyline, use the PEDIT command. PEDIT can also be used to modify the width to an existing polylines and append geometry.

The polyline edit command can be initiated four ways:

Menu: Modify→Object→Polyline	
Modify II Toolbar	
Command line: pedit	
Shortcut: pe	

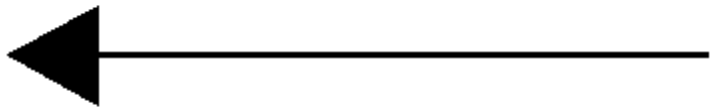
The PEDIT command has several options:	
Close Join Width Edit vertex Fit Spline Decurve Ltype gen Undo	[Close/Join/Width/Edit vertex/Fit/Spline/Decurve/Ltype gen/Undo]:
Close	Creates the closing segment of the polyline, connecting the last segment with the first. AutoCAD considers the polyline open unless you close it using the Close option.
Open	Removes the closing segment of the polyline. AutoCAD considers the polyline closed unless you open it using the Open option.
Join	Adds lines, arcs, or polylines to the end of an open polyline and removes the curve fitting from a curve-fit polyline. For objects to join the polyline, their endpoints must touch unless you use the Multiple option at the first PEDIT prompt. In this case, you can join polylines that do not touch if the fuzz distance is set to a value large enough to include the endpoints.
Width	Specifies a new uniform width for the entire polyline.
Edit Vertex	Marks the first vertex of the polyline by drawing an X on the screen. If you have specified a tangent direction for this vertex, an arrow is also drawn in that direction.
Fit	Creates a smooth curve consisting of pairs of arcs joining each pair of vertices. The curve passes through all vertices of the polyline and uses any tangent direction you specify.
Spline	Uses the vertices of the selected polyline as the control points, or frame, of a curve. The curve passes through the first and last control points unless the original polyline was closed. The curve is pulled toward the other points but does not necessarily pass through them. The more control points you specify in a particular part of the frame, the more pull they exert on the curve. The technical term for this type of curve is *B-spline*. AutoCAD can generate quadratic and cubic spline-fit polylines.
Decurve	Removes extra vertices inserted by a fit or spline curve and straightens all segments of the polyline. Retains tangent information assigned to the polyline vertices for use in subsequent fit curve requests. If you edit a spline-fit polyline with commands such as BREAK or TRIM, you cannot use the Decurve option.
Ltype gen	Generates the linetype in a continuous pattern through the vertices of the polyline. When turned off, this option generates the linetype starting and ending with a dash at each vertex. Ltype Gen does not apply to polylines with tapered segments.
Undo	Reverses operations as far back as the beginning of the PEDIT session.

Exercise 2-1:

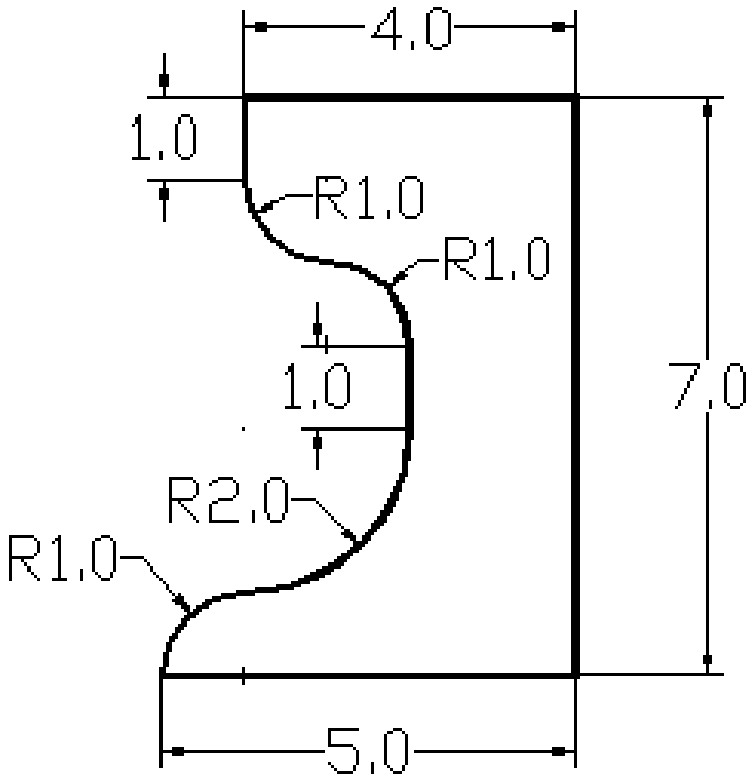
Drawing an Arrow

Polylines are very handy for creating an arrow shape.

```
Command: _pline
Specify start point: 2,2

Current line-width is 0.0000
Specify next point or [Arc/Halfwidth/Length/Undo/Width]: w

Specify starting width <0.0000>:  <ENTER>

Specify ending width <0.0000>: 0.8

Specify next point or [Arc/Halfwidth/Length/Undo/Width]:  <Ortho on> .75

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: w

Specify starting width <0.8000>: 0.04

Specify ending width <0.0400>:  <ENTER>

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: 5

Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]:  <ENTER>
```

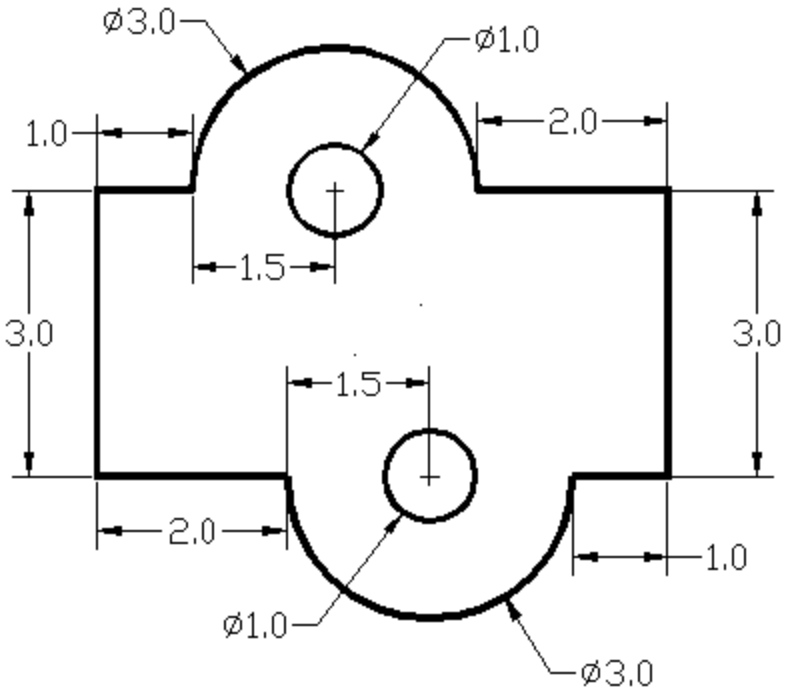


Exercise 2-2:



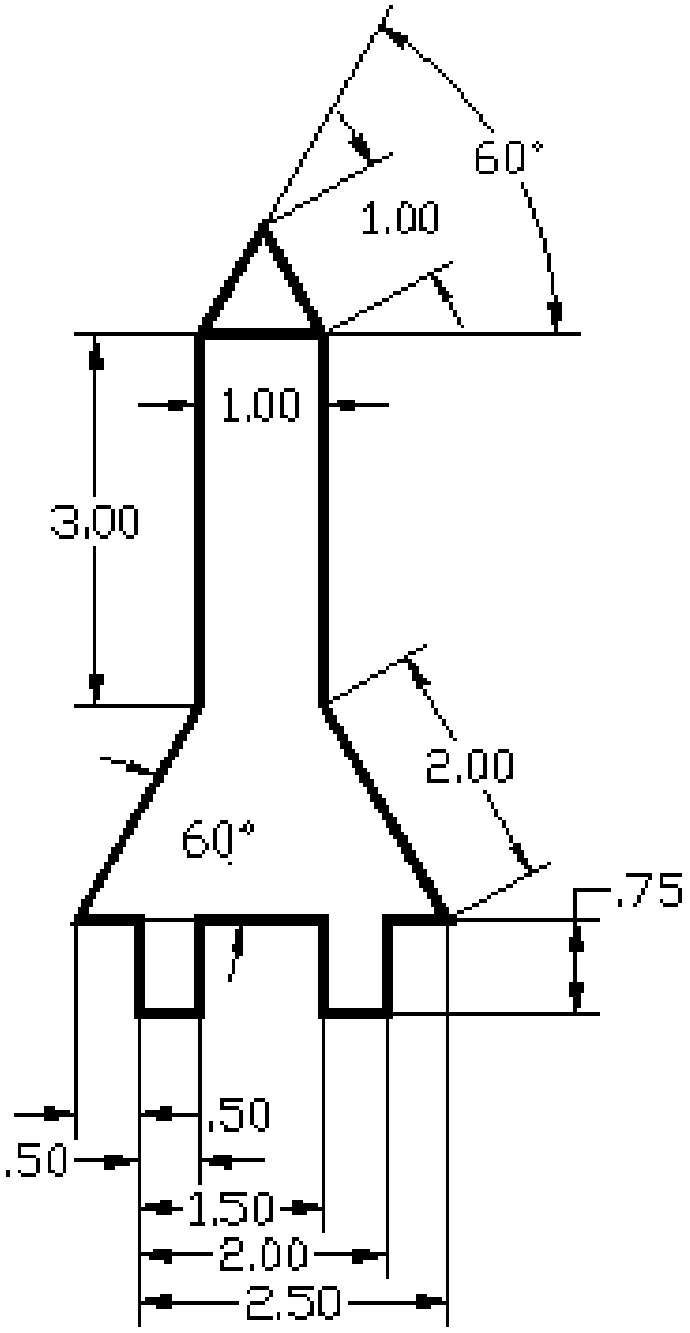
Draw the figure shown using polylines and polyarcs with a width of 0.04.

Exercise 2-3:



Use donut with W = 0.05 to create the circles.
Use polyline and polyarc with width = 0.04 to draw the outside figure.

Exercise 2-4:



Drawing using polyline with a width of 0.04.