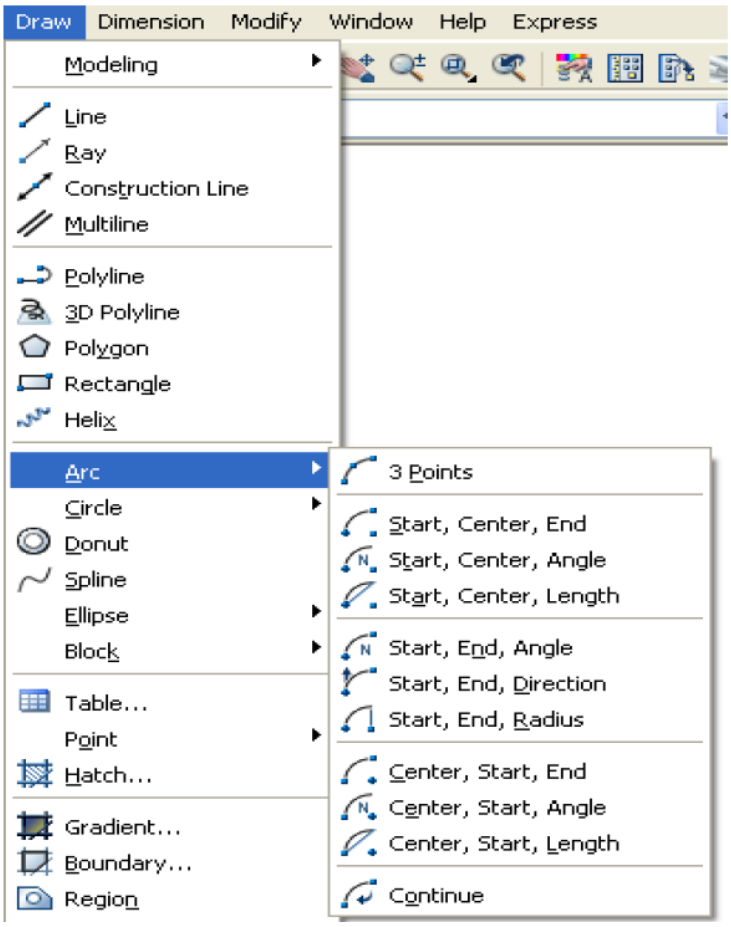
Draw Arcs

The arc drawing command is one of the important commands in the program, which follows drawing the line the straight is important due to the nature of engineering drawings and designs (architectural ,Mechanical, decoration....etc) of which almost no element is devoid of an arc or a curve.

The arc is part of a circle, so in order to draw it, you must know its center and its Radius In addition, you must be known starting and ending points of the arc.
You can draw Arcs in 11 different ways, depending on your use for the type of method on the information in your possession, the method of drawing the arc is considered to be indicative of 3points are the default method for the program, go to the **Draw** drop-down menu and choose the Arc command see its submenu and learn how to draw an arc.



Note:

1) The arc must be drawn in a counterclockwise direction except for method number 1

2) The arc must be drawn according to the order of each method. For example, Method 2 and Method 8 are similar, but the order sequence is different.

Ways to draw an arc:

1- Draw an arc of (3 points):

Step 1: Click on the command icon from the drawing toolbar, or type **A** for Arc Or from the Draw dropdown menu bar, choose Arc to display a submenu in front of you it contains ways to draw the arc, choose **3points.**

Step 2: When you choose the order, the program asks you to specify the starting point of the arc or arc center.

Specify Start point of arc or[center]

Enter the starting point of the arc with one methods of assigning points, for example (250,350), then **Enter**

Step 3: The program asks you to select the second point of the arc

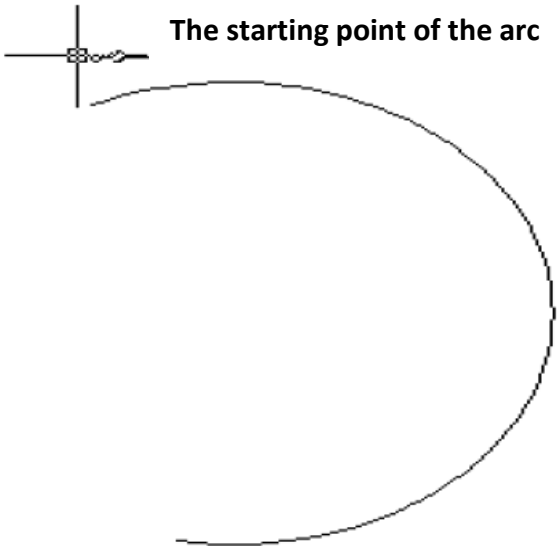
Specify second point of arc

Enter any point on the arc,(275,360) then **enter.**

Step 4: The program asks you to specify the end point of the arc

Specify end point of arc

Enter the end point of the arc and be it (300,0)then **Enter** The program draws for you the required arc in terms of three points.



2-Draw an arc In terms of (Start ,center ,end)

Choose the command in one of the known ways, if you choose the command from the Draw<Arc drop-down list and choose the subcommand, including **Start, center, end** the program will it asks you to enter the values that you chose to use, meaning that it will exempt you from writing what you want to enter , Either if you choose the command by typing the command on the **A** command bar or from the drawing toolbar by clicking on the icon for the Arc command, you must write on the command bar is what you want to enter because you did not know the program in the way you want to draw in advance, so you type C If you want to enter the center point and write A if you want to enter the angle and D for the direction and R for radius and so on..., this applies to different modes Draw an Arc The program asks you to enter the starting point

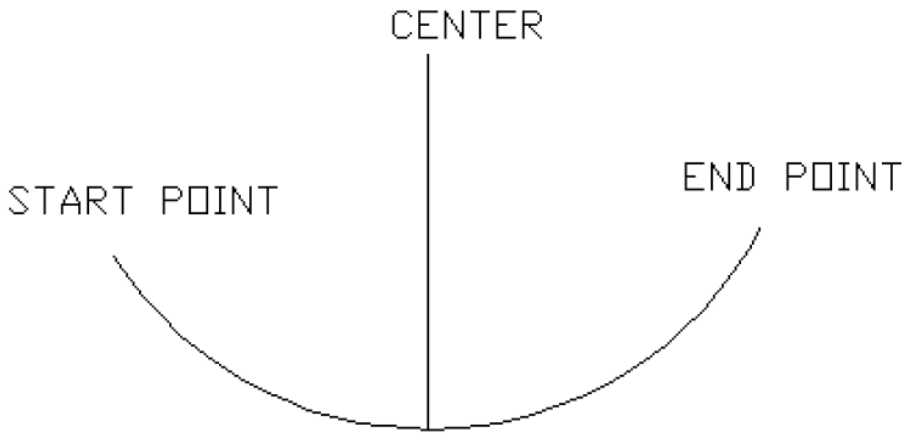
Specify Start point of arc or[center]

Enter the starting point in any way you want, and the program will return to ask you for a point Center arc and write that to the command bar

Specify center point of arc

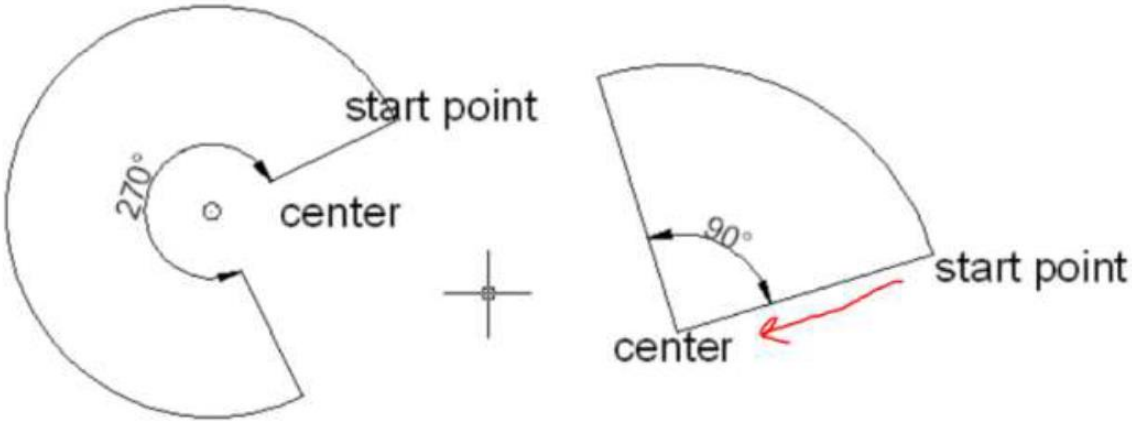
Of course, if you have specified the method of drawing, but if you do not specify the method, you must write the letter C An abbreviation for Center to inform the

program that you want to enter a center point enter the center point in one of the ways, the program asks you for the end point, and when you enter it you get the desired drawing.



3-Draw an arc In terms of (Start,center,angle)

Enter the starting point and the center point as you learned earlier, when you are asked to enter the angle enter the angle that you want the arc to cover the two **straight lines joining the beginning of the arc and the center, and the end of the arc and the center**, to know the concept of angle, we will draw two arcs with two different angles. Enter the first angle 90 and the second 270, so you will get the required drawing.



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7-Draw an arc In terms of (start,end,radius)

8-Draw an arc In terms of (center,start,end)

It simply means specifying 3 points starting with the center of the circle of the arc and then the starting point of the arc and the third point is the end of the arc. Select the three points in any way you want, so you get desired arc.

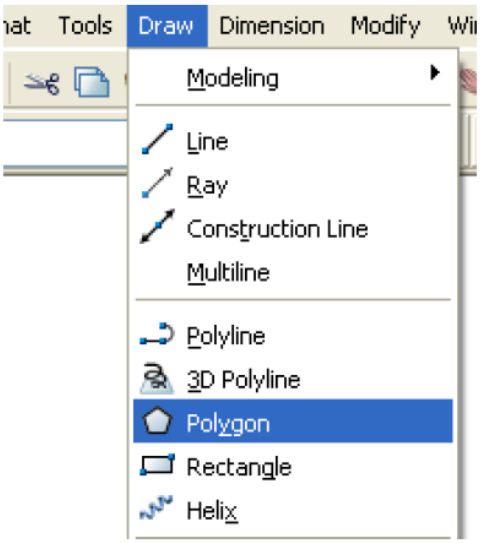
In the same way as the rest of the ways to draw the arc.

Draw Polygon

This command is used to create regular polygons such as: an equilateral triangle And the square, and the pentagon, and the hexagon, and the heptagon..... And through this you can draw Polygons whose number of sides ranges from 3 to 1024 sides.
The program deals with the form resulting from this command as one unit, and it can be done through the **Explode** Convert the shape into separate lines.

Drawing method:

Step 1: Choose the polygon command either from the Draw drop-down list of tools, or by typing the command **pol** on the command bar, or by clicking the polygon icon on the drawing toolbar**.**



Step 2: when executing the command, the program asks to specify the number of sides

Enter number of sides

We determine the number of sides of the shape, and to draw a regular hexagonal shape, we enter the number (6).

Step 3: After entering the number of the side, the program asks you to select a center Polygon or accompanying option side length.

Specify center of Polygon or[edge]

To determine the center of the polygon, we define the center point by one of the well-known methods, and to draw the polygon in terms of the length of its side, we write the letter **e** as an abbreviation for the option edge, and since we want to

draw the polygon in terms of the center, we enter the center point in one of the known methods, and let it be by entering the coordinates of the point (100,100).

Step 4: After we specify the center point of the polygon, the program responds with a message You are required to enter one of two options:

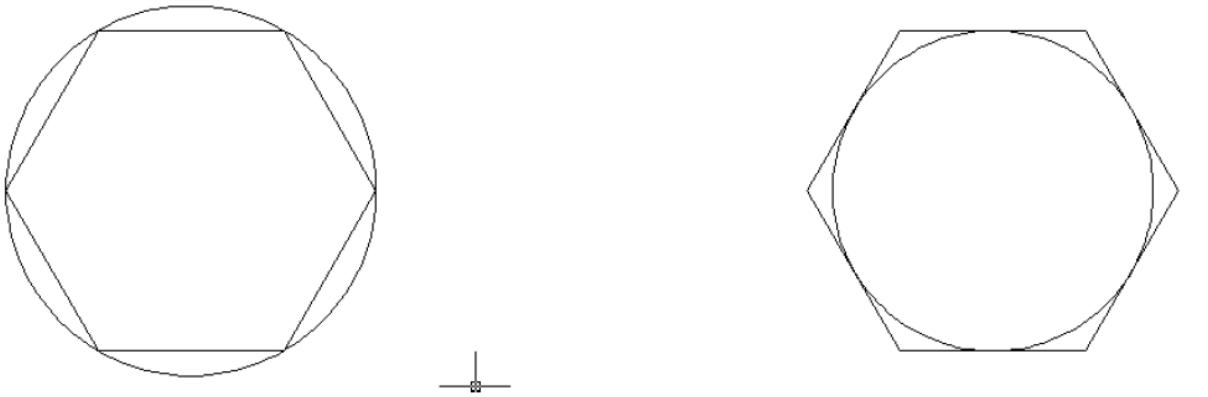
Enter an option[inscribed in circle/circumscribed about circle]

It means either drawing the polygon inside the circle or outside the circle. If we choose to draw inside the circle, we enter the letter i, abbreviation Inscribed. If your choice is to draw the polygon outside the circle, we enter the letter c, abbreviation Circumscribed.

Enter i or c. In both cases, the program will ask you to specify the radius of the circle

Specify radius of circle

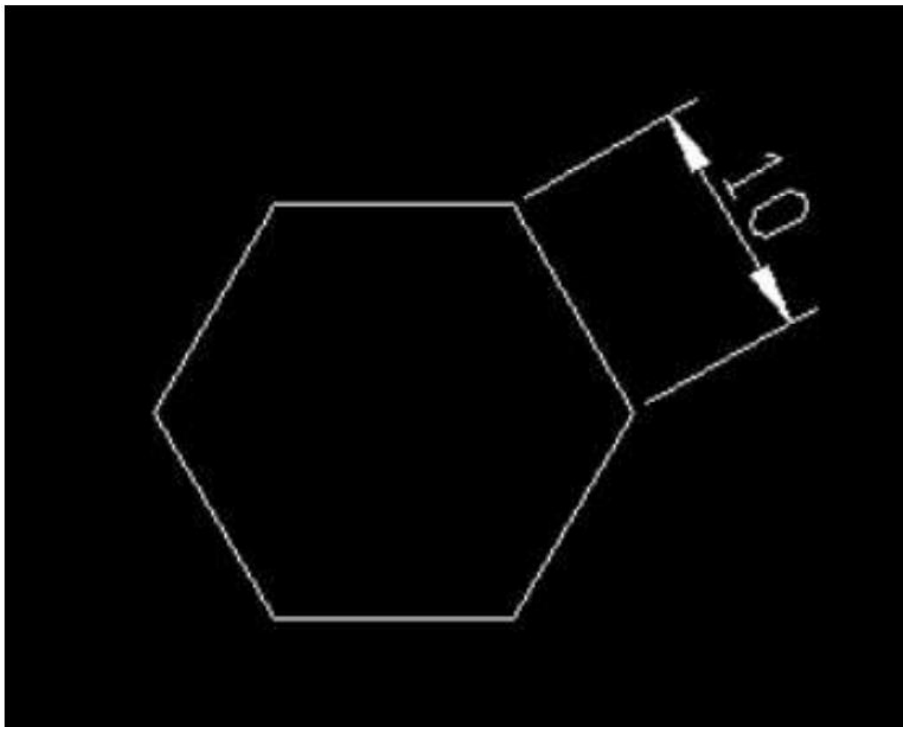
In which you want to draw the polygon inside or outside. Enter the radius and let it be 10 units The program will draw the desired shape for you.



Circumscribed Inscribed

Draw polygon by edges

If we want to draw the polygon in terms of its side length in the third step instead of entering the center point of the polygon we write the option **edge** or the letter **e**, so that the program asks you to **specify the first point of the edge**. We enter the first point in any way you want, and let the point have coordinates (100,100) so that the program asks for the second point, then we write @10<0 to draw a regular hexagon with side length 10 units



Example: **Draw a polygon with (8) sides surrounding a circle with a diameter of (80) units.**

Solution:

Command: Polygon

Enter number of sides < 7 >: 8

Specify center of Polygon or [Edge]: (100,100)

Enter an point [Inscribed in circle / Circumscribed about circle] < I >:C

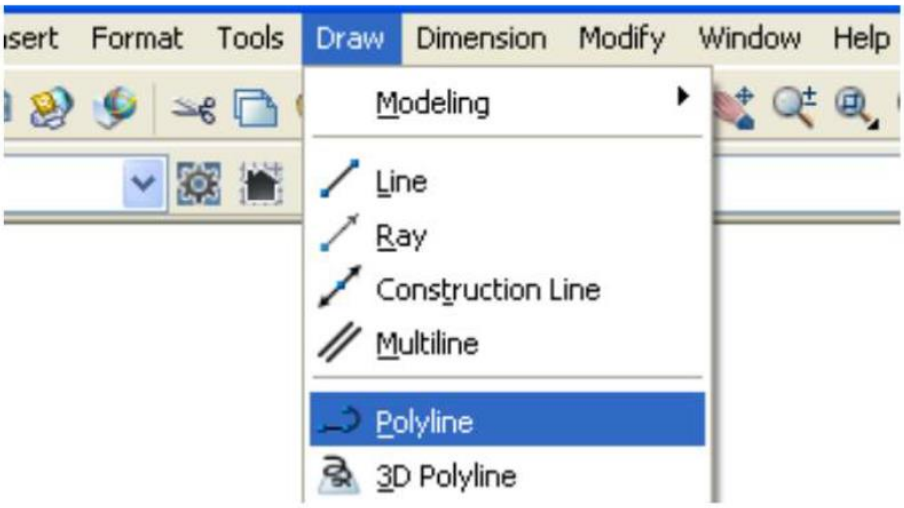
Specify radius of circle: 40

(polyline) command

This command is used to draw connected lines of different shapes and specifications, but they are treated as one indivisible unit. Through this command, you can draw straight lines, arc lines, or both together.

Drawing method:

Step1: choose the polyline command with one of the well-known methods: From the **Draw** drop-down list, choose **Polyline**



Or click on the command icon from the drawing bar 

Or type the command **polyline** or the letters **PL** on the command bar

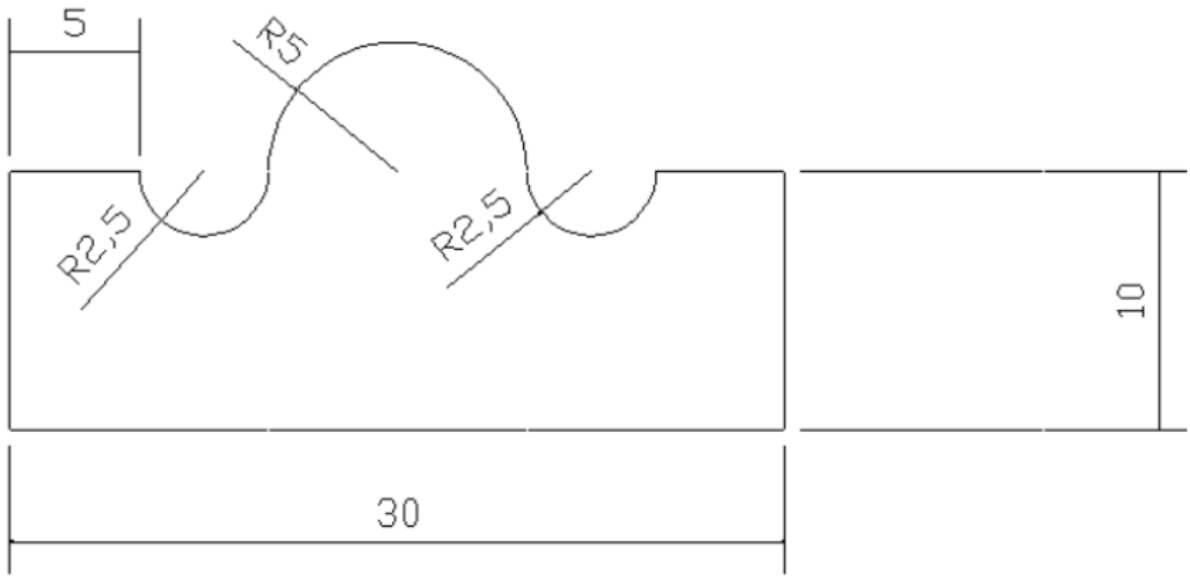
Step 2: When the **Specify start point** command appears, specify the starting point in one of the ways you learned earlier

Step 3: After selecting the starting point, the program asks you to specify the next point for the polyline

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

We notice the appearance of options accompanying the command, which are chosen according to your desire for the type of font.

Example: Draw the following figure with the command polyline



Solution:

Command: Limits
Specify lower left corner or [ON/OFF] <0.0000,0.0000>:0,0
Specify upper right corner <100.0000,100.0000>: 40,30
Command: z
[All/Center/Dynamic/Extents/Previous/Scale/Window/Object] <real time>:
a
Command: pl
Specify start point: 0.0
Specify next point or [Arc/Halfwidth/Length/Undo/Width]: @30,0
Specify next point or [Arc/Halfwidth/Length/Undo/Width]: @0,10
Specify next point or [Arc/Halfwidth/Length/Undo/Width]: @-5,0
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: a
[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]:
ce
Specify center point of arc: @-2.5,0
Specify endpoint of arc or [Angle/Length]: a Specify included angle: -180
[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]:
ce
Specify center point of arc: @-5,0
Specify endpoint of arc or [Angle/Length]: a Specify included angle: 180

[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]:
ce
Specify center point of arc: @-2.5,0
Specify endpoint of arc or [Angle/Length]: a Specify included angle: -180
[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]:
ce
Specify center point of arc: @-5,0
Specify endpoint of arc or [Angle/Length]: a Specify included angle: 180
[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]:
ce
Specify center point of arc: @-2.5,0
Specify endpoint of arc or [Angle/Length]: a Specify included angle: -180
[Angle/CEnter/CLose/Direction/Halfwidth/Line/Radius/Second pt/Undo/Width]: l
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: @-5,0
Specify next point or [Arc/Close/Halfwidth/Length/Undo/Width]: @0,-10
Enter