
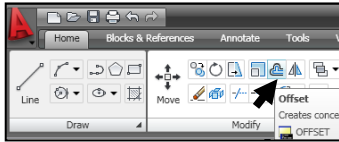



## The OFFSET Command:

- The **offset** command creates a new object at a specified distance from an existing object.

How to access the OFFSET Command:

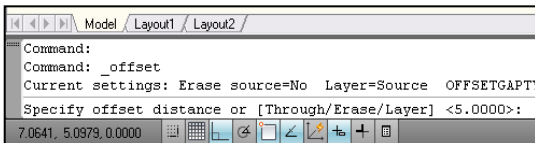
- From the Modify toolbar click on the offset icon. 



- Click the Menu Browser  and select: [Modify] → [Offset]
- Typing [Offset] or [O] in the command prompt area then press → [Enter]

## To use the Offset command do the following:

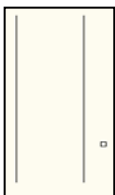
1. Select the **Offset** command icon by using one of the above ways.
2. Specify offset distance then [**ENTER**].



3. Select object to **Offset**.



4. Choose the direction of the offset and left-mouse-click.

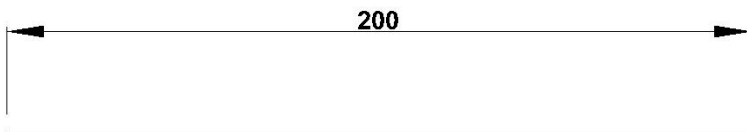




**Exercise # 1:**

Draw the below figure and then do the following:

- Use the offset command and offset 3 lines upward by 100 mm between each line.
- Use the offset command and offset 3 lines downward by 100 mm between each line.

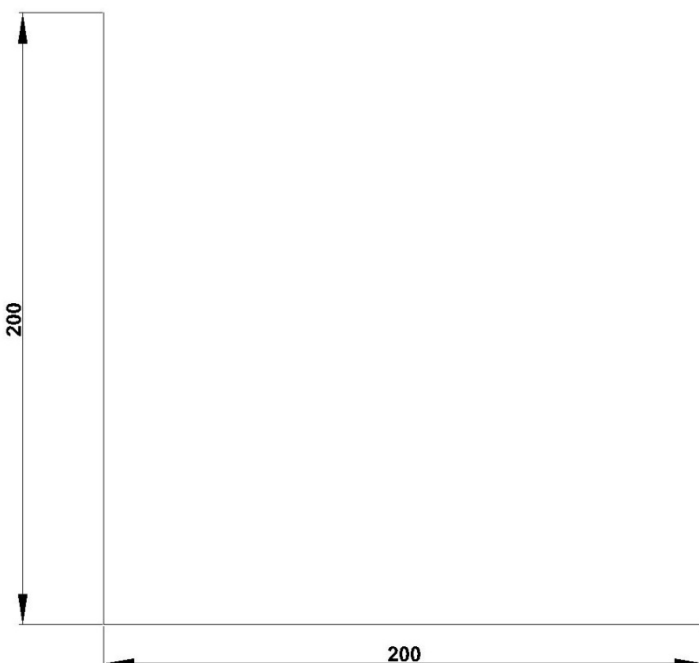


**Exercise # 2:**

Draw the below figure and then do the following:

- Use the offset command and offset the vertical line to the right by 200 mm.
- Use the offset command and offset the horizontal line upward by 200 mm.


At the end you will have a complete square

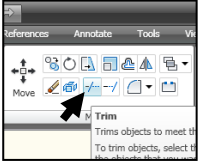



## The TRIM Command:

- The **Trim** command shortens an object in order that it ends exactly at a selected boundary.

How to access the TRIM Command:

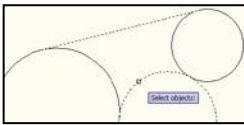
- From the Modify toolbar click on the Trim icon. 



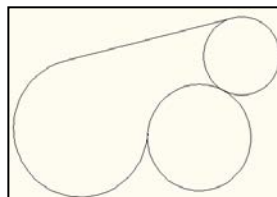
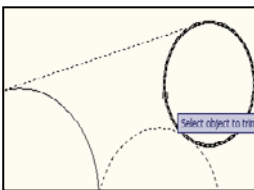
- Click the Menu Browser  and select: [Modify] → [Trim]
- Typing [Trim] or [TR] in the command prompt area then press → [Enter]

## To use the Trim command do the following:

1. Select the **Trim** command by using one of the above ways.
2. Select the boundary edges to which we want to trim the object then **[ENTER]**.



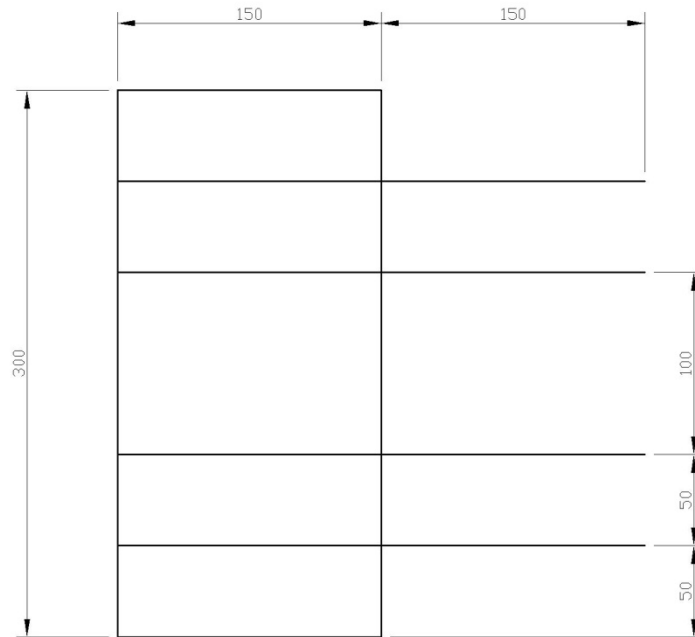
3. Select object to **Trim**.



### **Exercise # 1:**

Draw the below figure and then do the following:

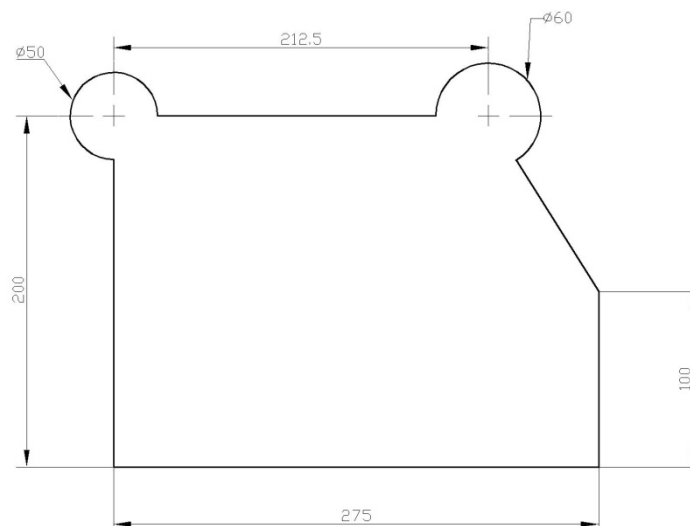
- Use the Trim command to cut all lines that extend outside the rectangle.



### **Exercise # 2:**

Draw the below figure and then do the following:

- Draw the two circles  $\varnothing 50$  &  $\varnothing 60$  at the drawing corners as shown below.
- Use the Trim command on the  $\varnothing 50$  &  $\varnothing 60$  circles to obtain the below shape.

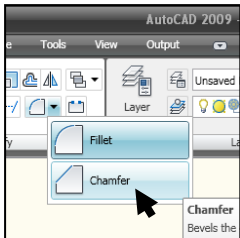



## The CHAMFER Command:

- The **Chamfer** command makes a flat surface by cutting off edges or corners.

How to access the CHAMFER Command:

- From the Modify toolbar click on the Chamfer icon.



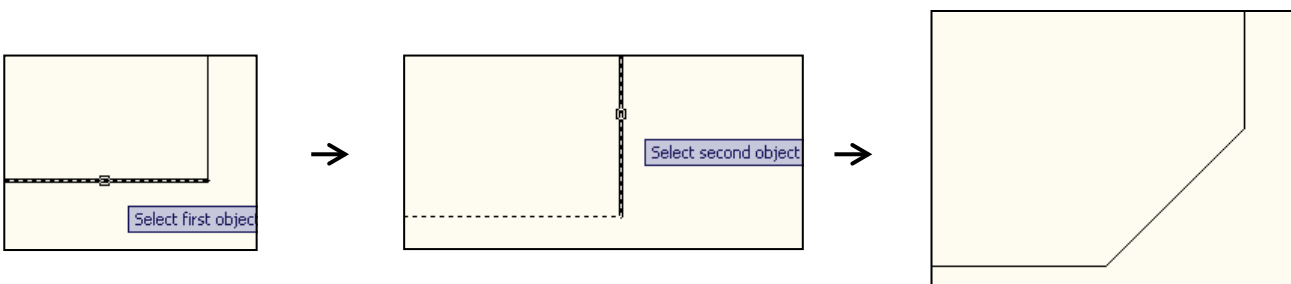
- Click the Menu Browser  and select: [Modify] → [Chamfer].
- Typing [Chamfer] or [Cha] in the command prompt area then pressing → [Enter].

## To use the Chamfer command do the following:

1. Select the **Chamfer** command icon.
2. Write [**a**]→[ENTER] to choose *Length* and *Angle* option.

```
Model / Layout1 / Layout2 /
Command: _chamfer
(TRIM mode) Current chamfer Dist1 = 0.0000, Dist2 = 0.0000
Select first line or [Undo/Polyline/Distance/Angle/Trim/mEthod/Multiple]: a
Specify chamfer length on the first line <0.0000>:
```

3. Specify *chamfer Length* [ENTER].
4. Specify *chamfer Angle* [ENTER].
5. Pick first line then second line as shown below.

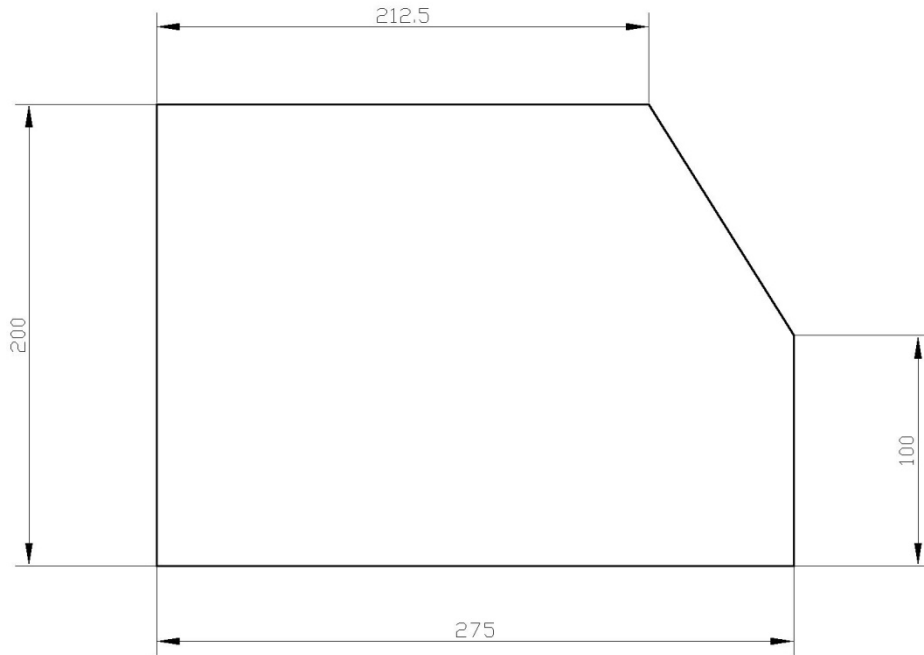




**Exercise # 1:**

Draw the below figure and then do the following:

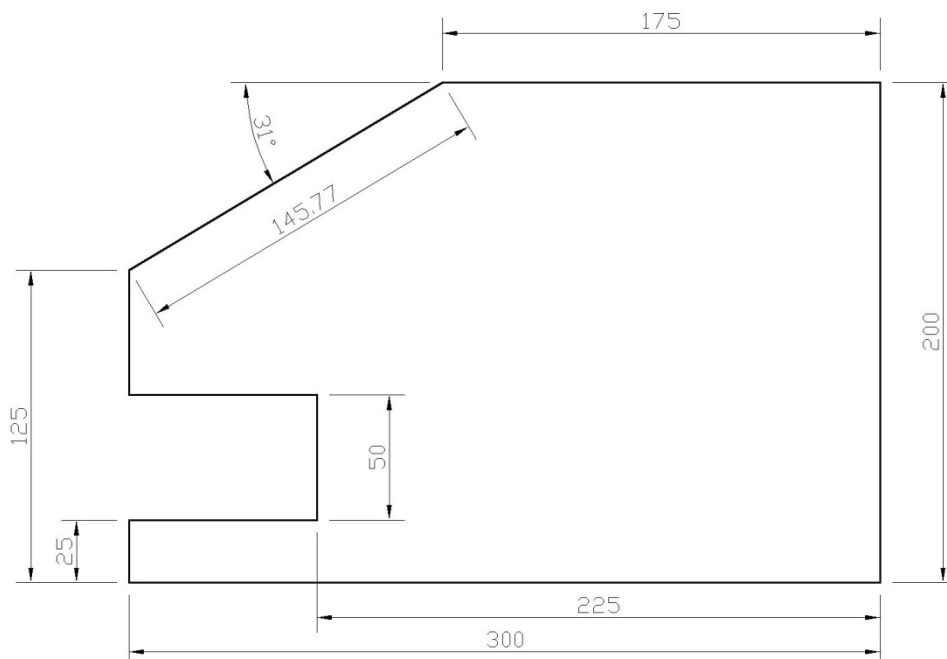
- Use the Chamfer command and apply a chamfer with an angle of  $45^\circ$  and a length of 20 to all corners.



**Exercise # 2:**

Draw the below figure and then do the following:

- Use the Chamfer command and apply a chamfer with an angle of  $30^\circ$  and a length of 10 to all corners.

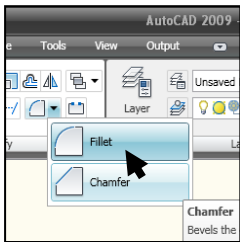



## The FILLET Command:

- The **Fillet** command rounds the edges of two lines, arcs, elliptical arcs, or circles with an arc of a specified radius.

How to access the FILLET Command:

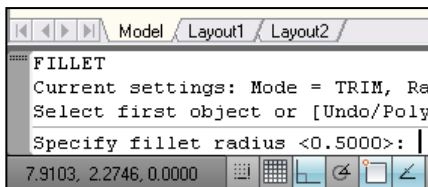
- From the Modify toolbar click on the Fillet icon.



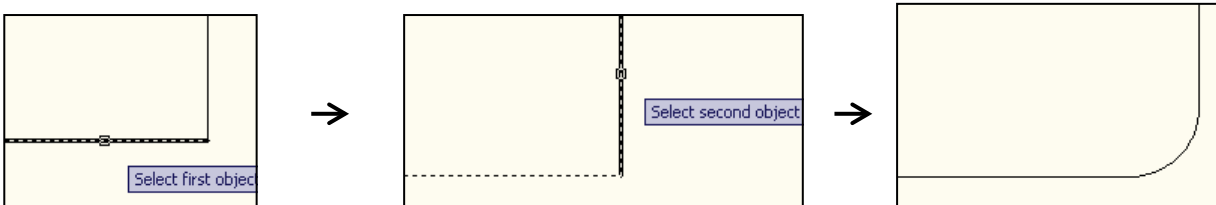
- Click the Menu Browser  and select: [Modify] → [Fillet].
- Typing [Fillet] or [f] in the command prompt area then pressing → [Enter].

## To use the Fillet command do the following:

1. Select the **Fillet** command icon.
2. Write [r]→[ENTER] to specify the fillet radius.



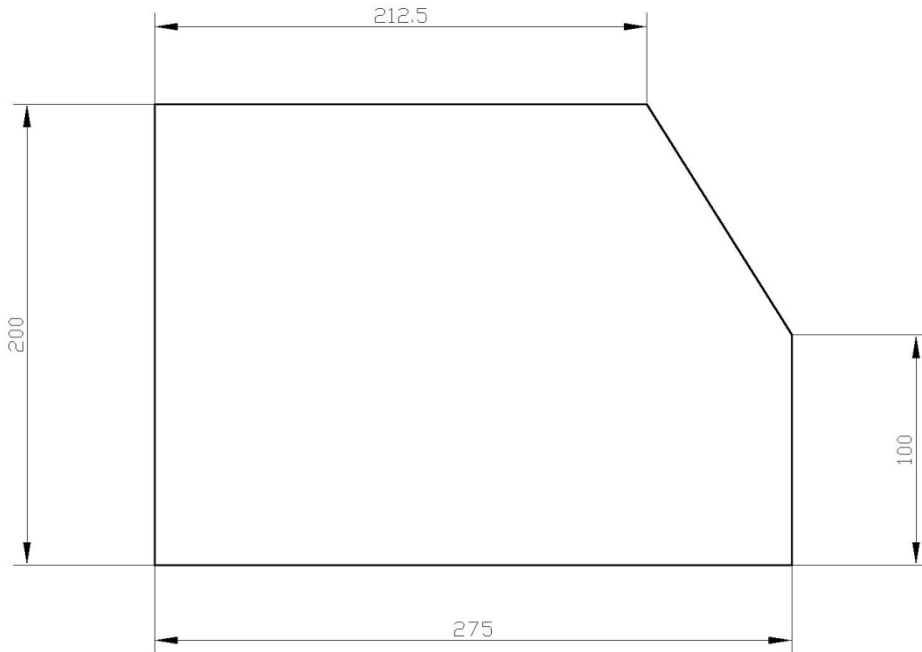
3. Specify *fillet radius* [ENTER].
4. Pick first line then second line as shown below.



**Exercise # 1:**

Draw the below figure and then do the following:

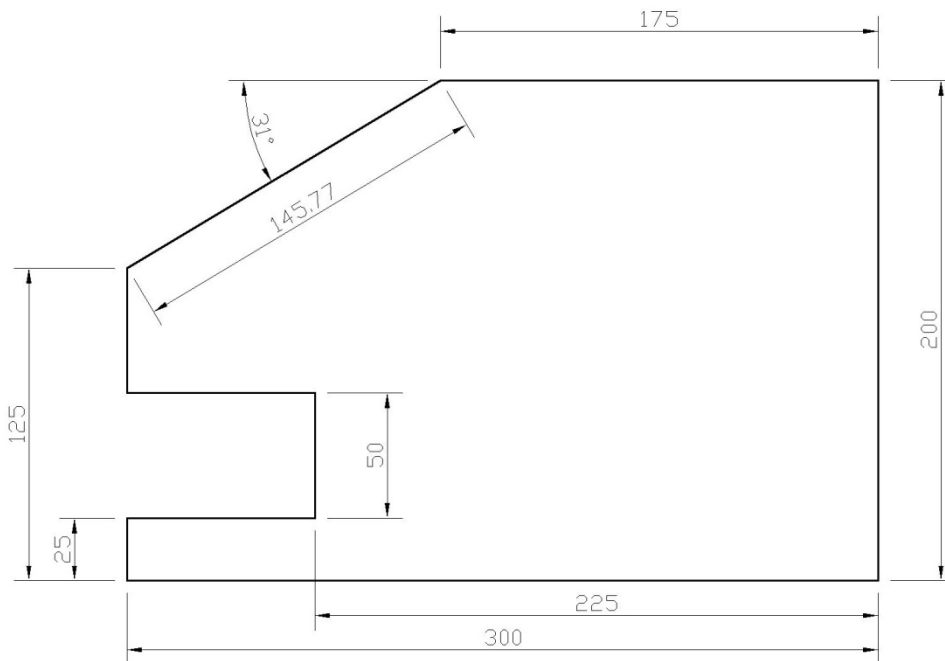
- Use the Fillet command and apply a fillet of R20 to all corners.



**Exercise # 2:**

Draw the below figure and then do the following:

- Use the Fillet command and apply a fillet of R10 to all corners.



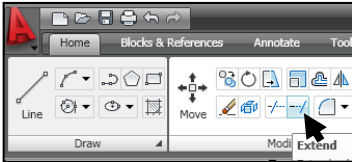



## The Extend Command:

- The **Extend** command lengthens an object so that it ends precisely at a selected boundary.

How to access the EXTEND Command:

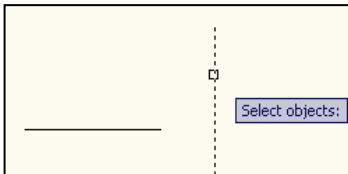
- From the Modify toolbar click on the Extend icon.---



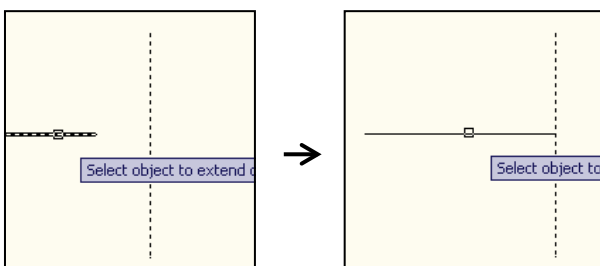
- Click the Menu Browser  and select: [Modify] → [Extend].
- Typing [Extend] or [Ex] in the command prompt area then pressing → [Enter].

## To use the Extend command do the following:

1. Select the **Extend** command icon.
2. Select the boundary edges to extend to then **[ENTER]**.



3. Select object to extend then **[ENTER]**.

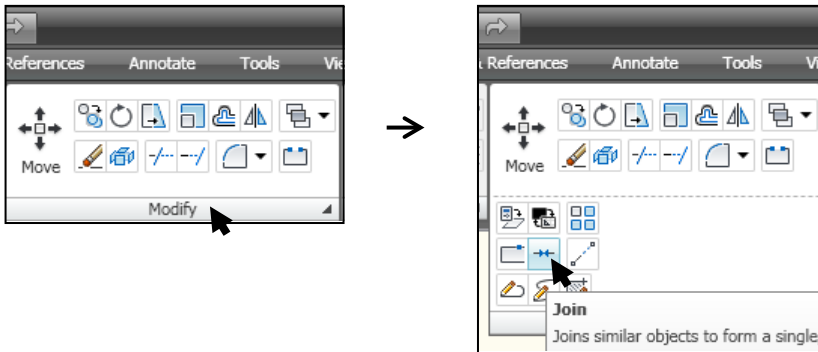



## The JOIN Command:

- The **Join** command joins similar objects to form a single, unbroken object.

How to access the Join Command:

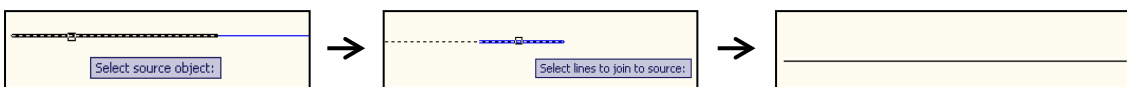
- From the Modify toolbar click on Modify then select the Join icon. →



- Click the Menu Browser  and select: [Modify] → [Join].
- Typing [Join] or [J] in the command prompt area then pressing → [Enter].

## To use the Join command do the following:


1. Select the **Join** command icon.
2. Select first object, second object and then **[ENTER]** as shown.

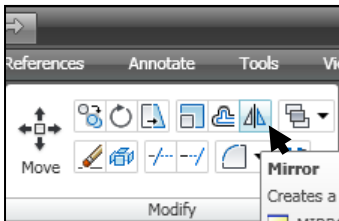



## The MIRROR Command:

- The **Mirror** command Creates a mirrored copy of selected objects.

How to access the Mirror Command:

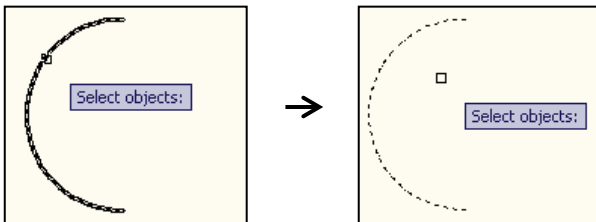
- From the Modify toolbar select the Mirror icon. 



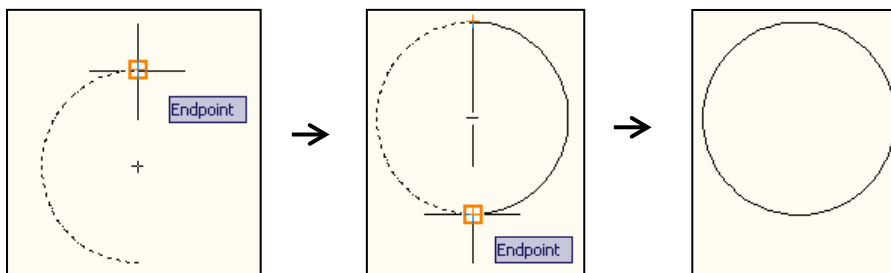
- Click the Menu Browser  and select: [Modify] → [Mirror].
- Typing [Mirror] or [Mi] in the command prompt area then pressing → [Enter].

### To use the Mirror command do the following:

1. Select the **Mirror** command icon.
2. Select objects to mirror → **[ENTER]**.



3. Specify first point then second point → **[ENTER]** to retain the original objects, or enter **Y** to erase them.



### The ARRAY Command:

- The **Array** command Creates multiple copies of objects in a pattern.

How to access the Array Command:

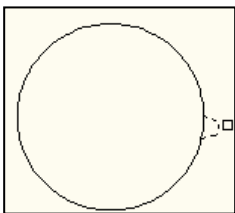
- From the Modify toolbar select the Array icon.
- Click the Menu Browser and select: [Modify] → [Array].
- Typing [Array] or [Ar] in the command prompt area then pressing → [Enter].

### To use the Array command do the following:

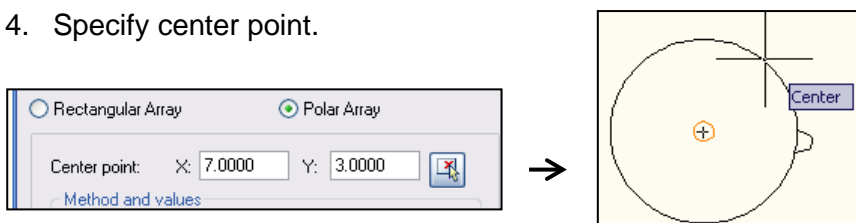
1. Select the Array command icon.
2. Choose Rectangle array "pattern" or Polar array "rotated" then Select objects to array.



3. Select objects to array → [ENTER].



4. Specify center point.



5. Choose method and values (total # of items & angle to fill, total # of items & angle between items, or angle to fill & angle between items) then enter the information → [OK].

