معهد التكنولوجيا التطبيقية

INSTITUTE OF APPLIED TECHNOLOGY

# AutoCAD 2D I

## Module 11

## Object Snap

PREPARED BY

**IAT Curriculum Unit**

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**Module 11**

Auto CAD Self-paced Learning Modules

# AutoCAD 2D

## Object Snap

**Learning Outcomes:**

**When you have completed the module, you will be able to:**

1. **Describe object snap. AutoSnap, manual object snap modes, and the object snap modes for a line, circle, and an arc.**
2. **Describe and apply the OSNAP command to set the object snap modes, how to enable and disable object snap, and use object snap to complete drawings.**

## Object Snap

*Object snap* allows you to immediately locate and attach to a predefined snap location(s) on an existing object in the drawing. All AutoCAD objects have at least one object snap location and you will learn them all as you work your way through the AutCAD Modules. In this module, the objects line, circle and arc are addressed.

Using object snap allows you to draw quickly and accurately using existing geometry in the drawing. You do this without having to know the coordinates of those objects. Objects snap is one of the most important features in any CAD system.

Study Figure 6-1, 6-2, and 6-3, they show the *object snap modes* for a line, circle and an arc. Notice how a line has 3 locations you can attach to while circles and arcshave 5 each. When requested, AutoCAD will find the exact location on existing objects.

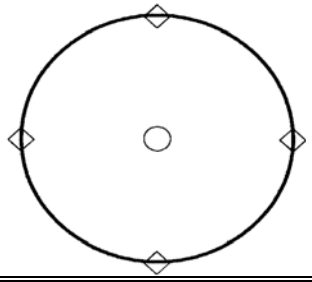
| Object Snap Modes for a circle | | | | |
|---|---|---|---|---|
| **Mode** | **Abbreviation** | **Icon** | **Marker** | **The AutoCAD Object** |
| Center | Cen |  |  |  |
| Quadrant | Quad |  |  | |

**Figure 11-1**
Object Snap Modes for a Circle

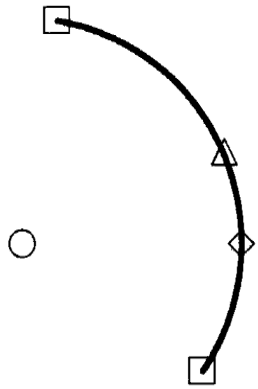
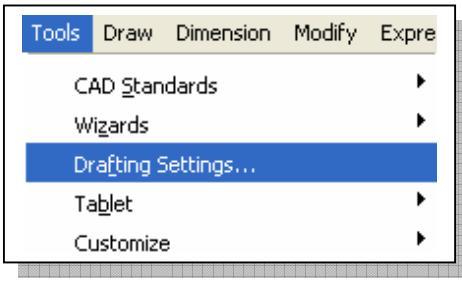
| Object Snap Modes for a circle | | | | |
|---|---|---|---|---|
| **Mode** | **Abbreviation** | **Icon** | **Marker** | **The AutoCAD Object** |
| Endpoint | End | | |  |
| Midpoint | Mid | | | |
| Center | Cen | | | |
| Quadrant | Quad | | | |

**Figure 11-2**
Object Snap Modes for an Arc

| Object Snap Modes for a circle | | | | |
|---|---|---|---|---|
| **Mode** | **Abbreviation** | **Icon** | **Marker** | **The AutoCAD Object** |
| Endpoint | End | | |  |
| Midpoint | Mid | | | |

**Figure 11-3**
Object Snap Modes for a Line

## The OSNAP Command




The OSNAP command is used to set the object snap Mode defaults

Command Line Syntax:
Command: **OSNAP** or Command: **OS**


**2004-2006**

**AutoCAD User "Must Know" No. 11-1**

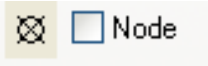
**Object snap is one of the most important features to an AutoCAD Operator. If you want to master AutoCAD, you must learn to use it and then apply it as much as possible. Anytime you have an existing object and can snap to a location on that object rather than entering coordinates for that location, you must do that. In almost all cases, let AutoCAD find the location rather than you entering the coordinates. AutoCAD uses a much higher precision of accuracy than you and there is always the chance you will make an error when entering coordinate numbers.**

## AutoSnap

*AutoSnap* is a visiual aid to help you see and use object snap modes more efficiently. It allows you to set the object snap modes you want AutoSnap to find. It can be enabled or disabled at anytime you choose. AutoSnap displays a *marker* and *tool tip* when you move your cursor over a object snap location that has been set to be found within the command.

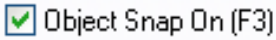
### Using the OSNAP Command

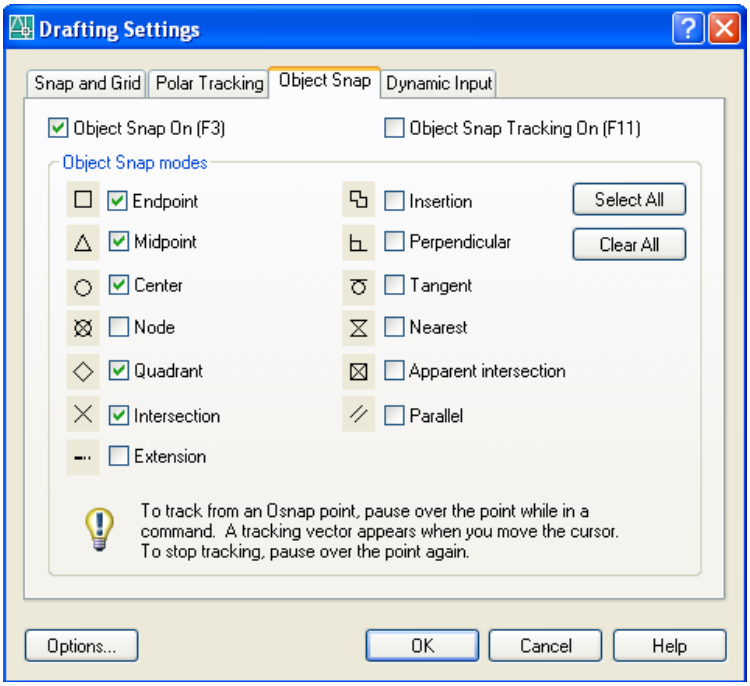
The OSNAP command is used to set which object snap modes AutoCAD will locate when it is enabled. It opens the Drafting Settings dialouge box as shown in Figure 8-4. Once set, it will retain the setting from drawing to drawing. The function key F3 is used as a toggle to quickly enable or disable AutoSnap.


Notice the Endpoint is enabled and the Node disabled

You can also enable or disable the AutoSnap feature as shown enable below



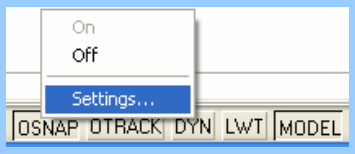
### AutoCAD User Tip No. 11-1

**The function key F3 toggles the AutoSnap feature off and on. Although there are other ways to do this, try to get into the habit of using F3 as it will greatly improve your drawing speed.**

### AutoCAD User Tip No. 11-2

**The OSNAP button on the status bar can also be used to enable or disable AutoSnap as shown below. To work faster, you can use it as a visible to see the current status of osnap and use F3 to toggle it.**


**If you right click the <u>OSNAP</u> toggles button on the status bar, you can open the <u>Drafting Setting</u> dialogue box by clicking <u>Setting…</u> to change the current setting for object snap modes.**




## Manual Object Snap Modes

You also enter manual object snap modes inside of any command that uses them. This can be a handy feature for modes you do not use very often. It also a good way to override the current setting and force AutoCAd to find just the mode you want. For example:

Command: **LINE**

Specify first point: **end** of **PICK 1**

*(Inside the LINE command, you must start the next line at the end of an existing Line. Instead of using AutoSnap, enter the mode <u>end</u> to AutoCAD's prompt and it asks <u>of</u>. When a line is picked, AutoCAD will snap to the closest endpoint on that line.)*

or

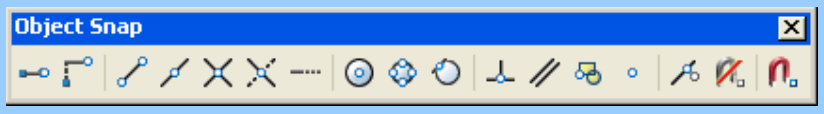
Command: **CIRCLE**

Specify center point for circle or[3P/2P/Ttr (tan tan radius): **mid** of **PICK 2**

*(Here in the CIRCLE command, the snap mode <u>mid</u> is entered and AutoCAD responds <u>of</u>. Pick an existing object and AutoCAD will snap to its midpoint.)*

### AutoCAD User Tip No. 11-3

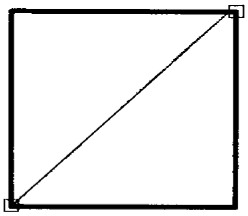
**When using the manual object snap method, the Object Snap toolbar can be used rather than typing the object snap modes. A tool tip will open as you pass your cursor over each icon to see what mode each one represents.**



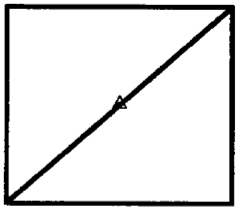
# AutoCAD Geometry Lesson
# Finding the Center of a Square or Rectangle

## Method 1

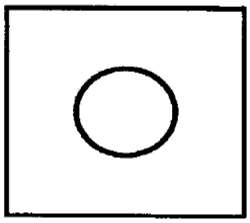
Step 1**:** Draw a line between any two diagonal corners by snapping to the endpoint.



Step 2**:** The midpoint on the line you inserted in step 1 is the center of the square or rectangle.

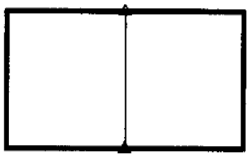


Step 3**:** In this step, a circle is inserted at the midpoint of the line and line is erased. The circle is exactly in the center of the square or rectangle.



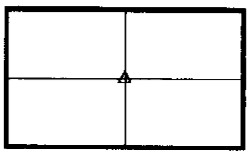
## Method 2

Step 1**:** Draw a line between the midpoint of two opposite sides of the rectangle or square.

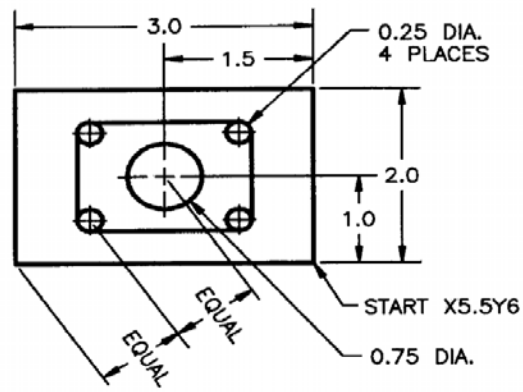


Step 2**:** Draw another line between the midpoint of the other opposite sides of the rectangle or square.

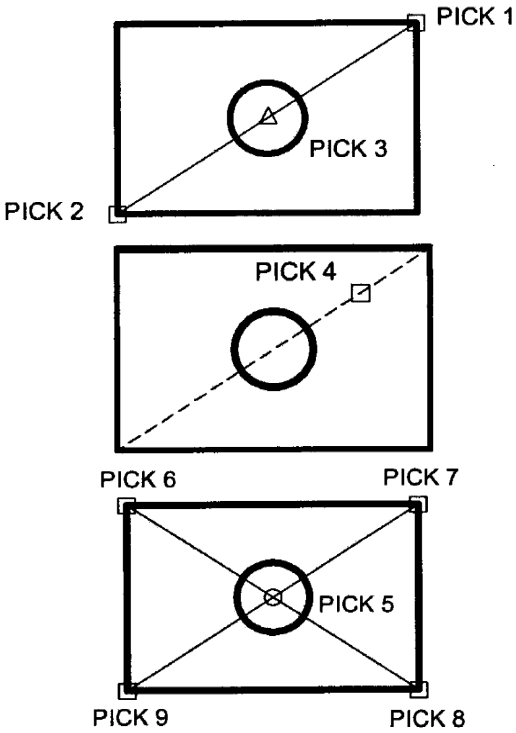
Step 3**:** The midpointof either line and the intersection of the two lines is the center of the rectangle or square. One line would have been enough to find the center but quite often you need a center line in both directions.



## Using the OSNAP Command



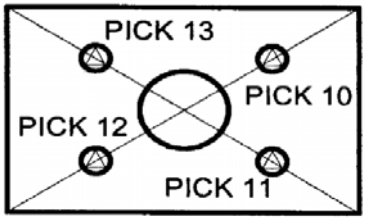

Command: **OSNAP**
*(First, set the object snapping modes)*
Command:<osnap on>
*(Press F3 to enable Osnap)*
Command: **L**
Specify first point: **4,3.5**
Specify next point or [Undo]:**@0,2**
Specify next point or [Undo]:**@-3,0**
Specify next point or [Undo]:**@0,-2**
Specify next point or [Undo]:**C**
Command: **L**
Specify first point: **end** of **PICK 1**
*(Snap to the end of the line.)*
Specify next point or [Undo]: **end** of **PICK 2**
*(Snap to the end of opposite line.)*
Specify next point or [Undo]:
Command: **CIRCLE**
Specify center point for circle or[3P/2P/Ttr (tan tan radius): **mid of PICK 3**
Specify radius of circle or [Diameter]: **D**
Specify diameter of circle: **.75**
Command: **ERASE**
Select objects: **PICK 4** 1found
Select objects:
Command: **LINE**
Specify first point: **cen of PICK 5**
Specify next point or [Undo]: **end of PICK 6**
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **cen of PICK 5**
Specify next point or [Undo]: **end of PICK 7**
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **cen of PICK 5**
Specify next point or [Undo]: **end of PICK 8**
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **cen of PICK 5**
Specify next point or [Undo]: **end of PICK 9**
Specify next point or [Undo]:

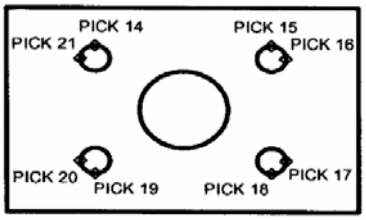


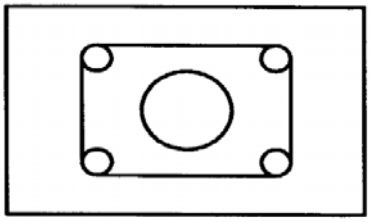

Command: **CIRCLE**
Specify center point for circle or[3P/2P/Ttr (tan tan radius): **mid of PICK 10**
Specify radius of circle or [Diameter]: **D**
Specify diameter of circle: **.25**
Command: **CIRCLE**
Specify center point for circle or[3P/2P/Ttr (tan tan radius): **mid of PICK 11**
Specify radius of circle or [Diameter]<0.125>:

## Using the OSNAP Command – Continued

Command: **CIRCLE**
Specify center point for circle or[3P/2P/Ttr (tan tan radius)
**mid of PICK 12**
Specify radius of circle or [Diameter]<0.125>:
Command: **CIRCLE**
Specify center point for circle or[3P/2P/Ttr (tan tan radius)
**mid of PICK 13**
Specify radius of circle or [Diameter]<0.125>:
Command: **LINE**
Specify first point: **quad of PICK 14**
Specify next point or [Undo]: **quad of PICK 15**
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **quad of PICK 16**
Specify next point or [Undo]: **quad of PICK 17**
*(Here inserting the line from quad to quad)*
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **quad of PICK 18**
Specify next point or [Undo]: **quad of PICK 19**
Specify next point or [Undo]:
Command: **LINE**
Specify first point: **quad of PICK 20**
Specify next point or [Undo]: **quad of PICK 21**

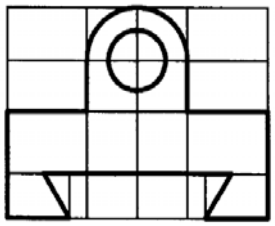


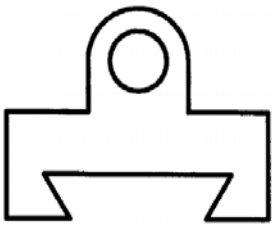



## AutoCAD Geometry Lesson
## Using Construction Objects

The best way to construct some objects is to draw construction objects to aid you. You will see more and more drawings like this in future lab exercises. Construction objects are objects that you draw to be used for construction only and will not be part of the finished drawing. It is important to save those objects for later use or to see how the construction was performed.





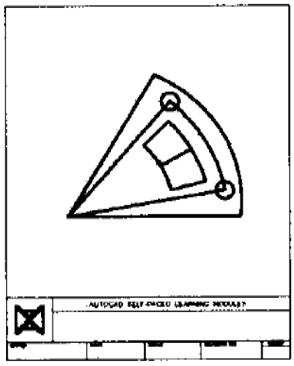
From this point forward, in all lab exercises, you will be asked to create a layer named Construction, color 253. Draw all construction objects on this layer and do not delete them. When you have finished the drawing, freeze the layer Construction. When required, simply thaw the construction layer to gain access to the construction objects. See the drawing above. The object on the left has all the construction objects displayed and on the right, they are frozen.

**Note: Some drawings do not require any construction objects to be drawn.**

| Lab Exercise 11-1 | | | | Time Allotted: 30 min. |
|---|---|---|---|---|
| **Drawing Specifications** | | | | |
| **Name** | **Template** | **Units** | **Text Style** | **Font** |
| **AutoCAD 2D Lab 11-1** | **Module Template A** | **Inches** | **N/A** | **N/A** |
| Note: Color, Linetype and Lineweight are all 'ByLayer' unless otherwise instructed. | | | | |
| **Layering Scheme** | | | | |
| **Objects on Layer** | **Name** | **Color** | **Linetype** | **Lineweight** |
| **Construction Objects** | **Construction** | **253** | **N/A** | **N/A** |
| **Lines and Arcs** | **Object 1** | **Red** | **N/A** | **N/A** |
| **Circles** | **Object 2** | **Blue** | **N/A** | **N/A** |

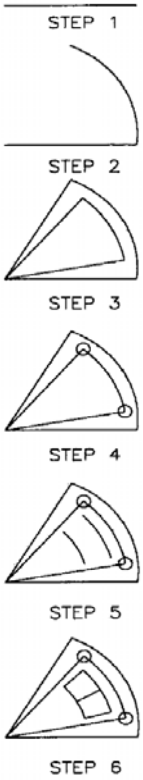
**Instruction:**

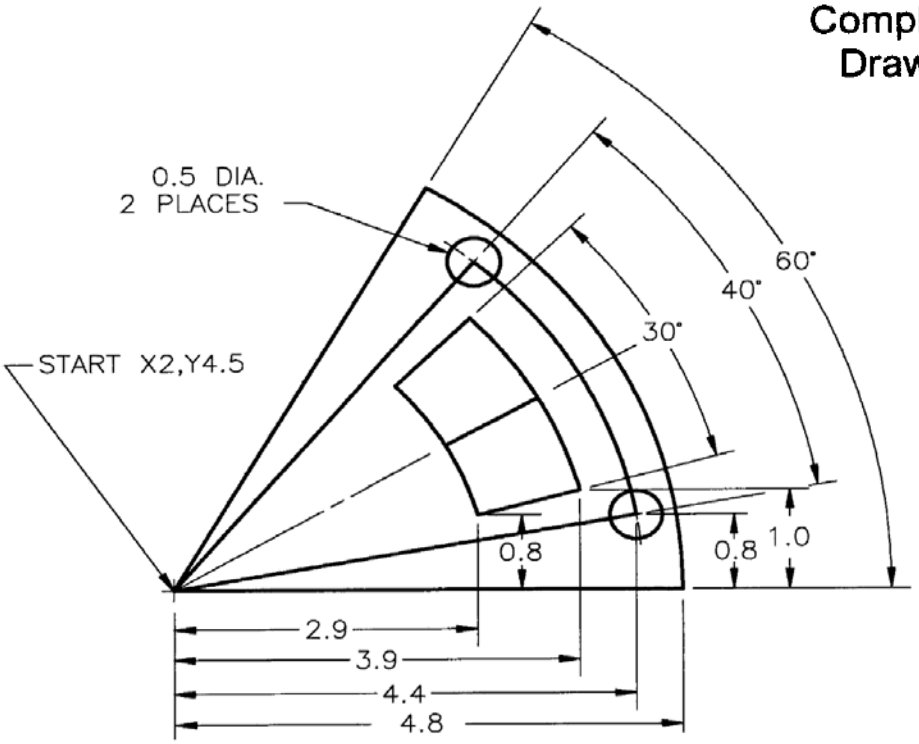
1. Setup the layers using the Layering Scheme above.
2. Draw all construction objects on layer Construction and freeze It when complete.
   Note: Some drawings do not require any construction objects to be drawn.
3. Draw the object shown below.
4. Check your drawing with the key.



Completed Drawing

**Hint:**

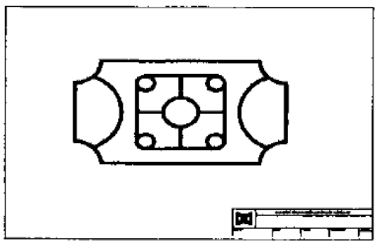


| Lab Exercise 11-2 | | | | Time Allotted: 30 min. |
|---|---|---|---|---|
| **Drawing Specifications** | | | | |
| **Name** | **Template** | **Units** | **Text Style** | **Font** |
| **AutoCAD 2D Lab 11-2** | **Module Template C** | **Inches** | **N/A** | **N/A** |
| Note: Color, Linetype and Lineweight are all 'ByLayer' unless otherwise instructed. | | | | |
| **Layering Scheme** | | | | |
| **Objects on Layer** | **Name** | **Color** | **Linetype** | **Lineweight** |
| **Construction Objects** | **Construction** | **253** | **N/A** | **N/A** |
| **Lines and Arcs** | **Object 1** | **Red** | **N/A** | **N/A** |
| **Circles** | **Object 2** | **Blue** | **N/A** | **N/A** |

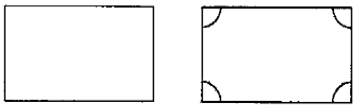
**Instruction:**

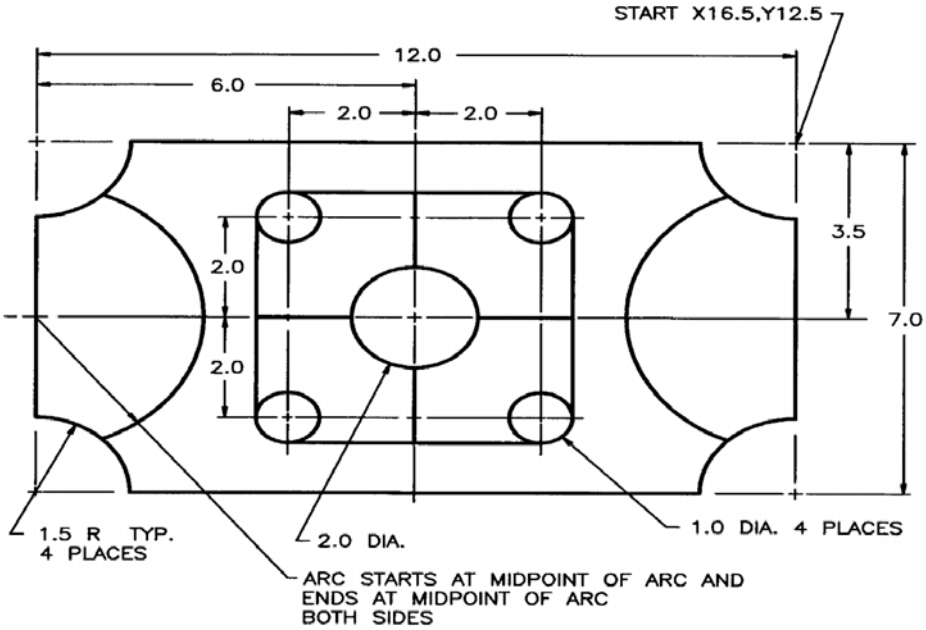
1. Setup the layers using the Layering Scheme above.
2. Draw all construction objects on layer Construction and freeze It when complete.
   Note: Some drawings do not require any construction objects to be drawn.
3. Draw the object shown below.
4. Check your drawing with the key.



Completed Drawing

**Hint:** Start by drawing a rectangle on layer Construction.

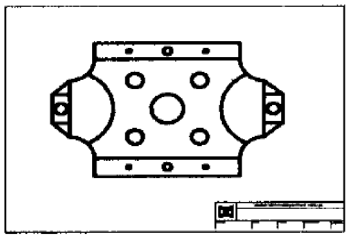


| Lab Exercise 11-3 | | | | Time Allotted: 30 min. |
|---|---|---|---|---|
| **Drawing Specifications** | | | | |
| **Name** | **Template** | **Units** | **Text Style** | **Font** |
| **AutoCAD 2D Lab 11-3** | **N/A** | **N/A** | **N/A** | **N/A** |
| Note: Color, Linetype and Lineweight are all 'ByLayer' unless otherwise instructed. | | | | |
| **Layering Scheme** | | | | |
| **Objects on Layer** | **Name** | **Color** | **Linetype** | **Lineweight** |
| **Construction Objects** | **Construction** | **253** | **N/A** | **N/A** |
| **Lines and Arcs** | **Object 1** | **Red** | **N/A** | **N/A** |
| **Circles** | **Object 2** | **Blue** | **N/A** | **N/A** |

**Instruction:**

1. Open the drawing AutoCAD 2D Lab 06-2.
2. Using the SAVEAS command, save it with the name AutoCAD 2D Lab 06-2.
3. Draw the object shown below.
4. Check your drawing with the key.



Completed Drawing