

## **LEARNING OBJECTIVES**

*After completing this lesson, you will be able to:*

1. Use the Break command
2. Trim an object to a cutting edge
3. Extend an object to a boundary
4. Move and object to a new location
5. Explode objects to their primitive entities.

# **LESSON 6**

# BREAK

The **BREAK** command allows you to break an object at a single point (Break at Point) or between two points (Break). I think of it as breaking a single line segment into two segments or taking a bite out of an object.

## METHOD 1 - Break at a Single Point

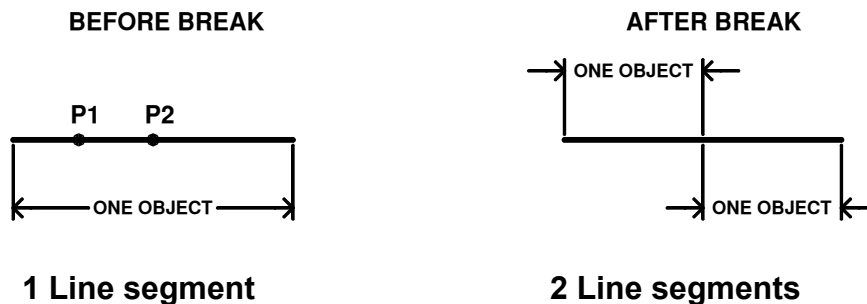
How to break one Line into two separate objects with no visible space in between.

1. Select the **BREAK AT POINT** command by using::

Ribbon = Home tab / Modify panel▼ / 

2. `_break` Select objects: ***select the object to break (P1).***

3. Specify first break point: ***select break location (P2) accurately.***



**Note:**

***The single line is now 2 lines but no gap in between the 2 lines.***

***For example, an 2 inch long line would become two 1 inch lines butted together.***

# BREAK....continued

## METHOD 2

Break between 2 points. (Take a bite out of an object.)

(Use this method if the location of the BREAK is not important.)

1. Select the **BREAK** command using one of the following:

Ribbon = Home tab / Modify panel ▼ / 

or

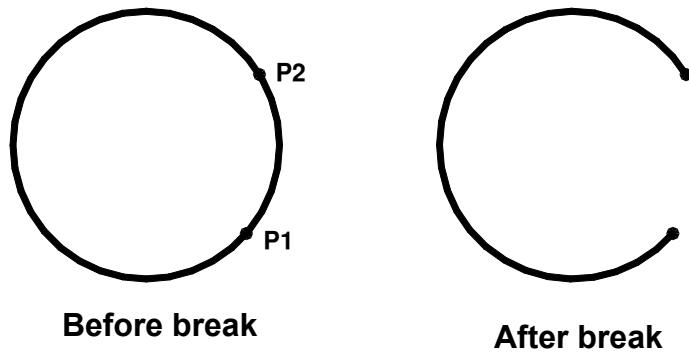
Keyboard = BR <enter>

2. `_break` Select object: *pick the first break location (P1)*.
3. Specify second break point or [First point]: *pick the second break location (P2)*.



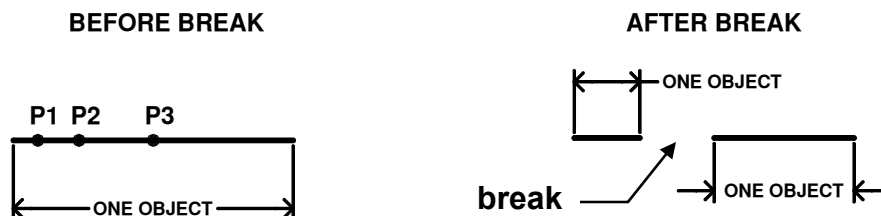
### Note:

- A. Circles break Counter clockwise. (CCW)
- B. Circles can't be broken with "1 point". You must use 2 points.



The following method is the same as method 2 above; however, use this method if the location of the break is very specific.


1. Select the **BREAK** command.
2. `_break` Select objects: *select the object to break (P1) anywhere on the object*.
3. Specify second break point or [First point]: *type F <enter>*.
4. Specify first break point: *select the first break location (P2) accurately*.
5. Specify second break point: *select the second break location (P3) accurately*.



# TRIM

The **TRIM** command is used to trim an object to a **cutting edge**. You first select the “Cutting Edge” and then select the part of the object you want to trim. The object to be trimmed must actually intersect the cutting edge or could intersect if the objects were infinite in length.

1. Select the Trim command using one of the following:

**Ribbon = Home tab / Modify panel / **  
**or**  
**Keyboard = TR <enter>**

2. The following will appear on the command line:

Command: `_trim`

Current settings: Projection = UCS Edge = Extend

Select cutting edges ...

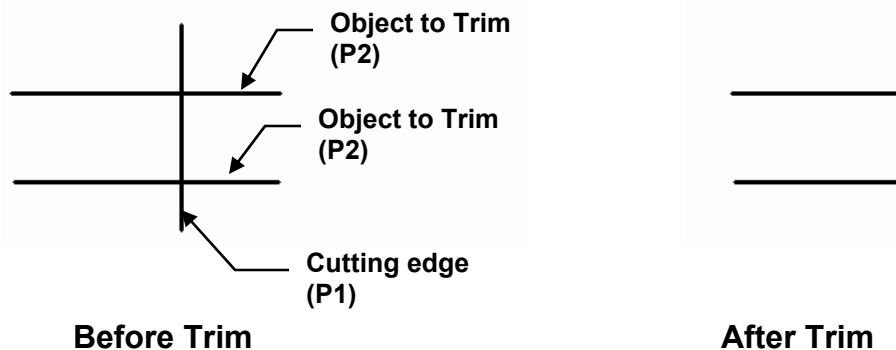
Select objects or <select all>: ***select cutting edge(s) by clicking on the object (P1)***

Select objects: ***stop selecting cutting edges by pressing the <enter> key***

Select object to trim or shift-select to extend or

[Fence/Crossing/Project/Edge/eRase/Undo]: ***select the object that you want to trim. (P2)***  
***(Select the part of the object that you want to disappear, not the part you want to remain)***

Select object to trim or [Fence/Crossing/Project/Edge/eRase/Undo]: ***press <enter> to stop***



Note: You may toggle between Trim and Extend (page 6-5). Hold down the shift key and the Extend command will activate. Release the shift key and you return to Trim.

**Fence** See page 6-13

**Edge** See page 6-5

**Project** See page 6-5

**Crossing** You may select objects using a Crossing Window.

**eRase** You may erase an object instead of trimming while in the Trim command.

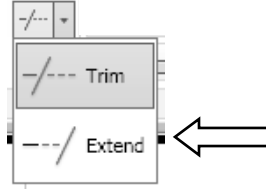
**Undo** You may “undo” the last trimmed object while in the Trim command

# EXTEND

The **EXTEND** command is used to extend an object to a **boundary**. The object to be extended must actually or theoretically intersect the boundary.

1. Select the **EXTEND** command using one of the following:

**Ribbon = Home tab / Modify panel /**  
**or**  
**Keyboard = EX <enter>**



2. The following will appear on the command line:

Command: `_extend`

Current settings: Projection = UCS Edge = Extend

Select boundary edges ...

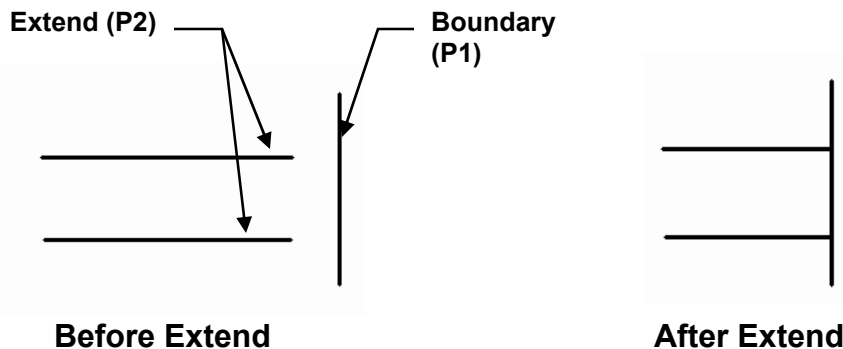
Select objects or <select all>: ***select boundary (P1) by clicking on the object.***

Select objects: ***stop selecting boundaries by selecting <enter>.***

Select object to extend or shift-select to Trim or

[Fence/Crossing/Project/Edge/Undo]: ***select the object that you want to extend (P2 and P3). (Select the end of the object that you want to extend.)***

Select object to extend or [Fence/Crossing/Project/Edge/Undo]: ***stop selecting objects by pressing <enter>.***



Note: When selecting the object to be extended (P2 and P3 above) click on the end pointing towards the boundary.

**Fence** See page 6-13

**Crossing** See page 6-4

**Project** Same as Edge except used only in "3D".

**Edge** (Extend or No Extend)

In the "**Extend**" mode, (default mode) the boundary and the Objects to be extended need only intersect if the objects were infinite in length.


In the "**No Extend**" mode the boundary and the objects to be extended must visibly intersect.

**Undo** See page 6-4

# MOVE

The **MOVE** command is used to move object(s) from their current location (base point) to a new location (second displacement point).

1. Select the Move command using one of the following:

**Ribbon = Home tab / Modify panel / **  
**or**  
**Keyboard = M <enter>**

2. The following will appear on the command line:

Command: `_move`

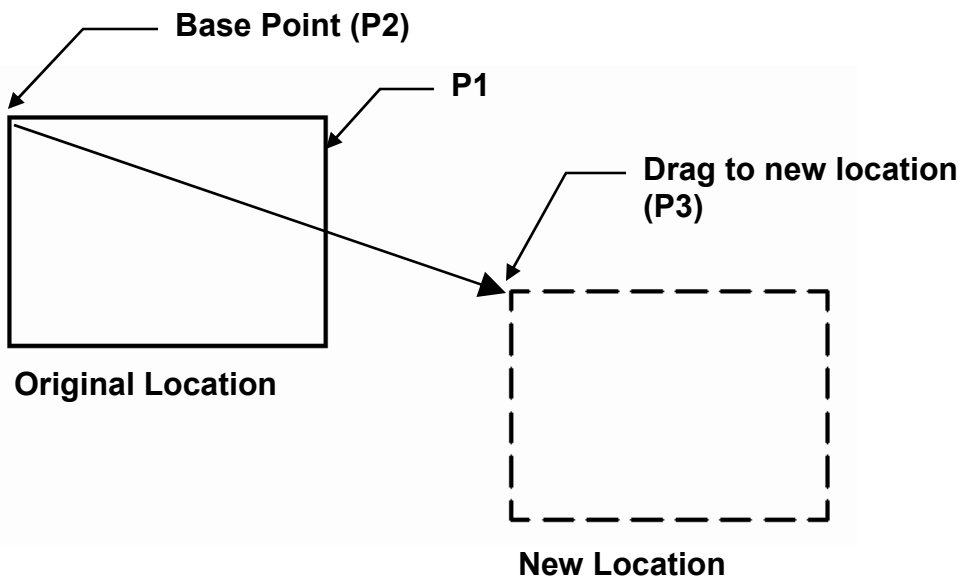
Select objects: ***select the object(s) you want to move (P1).***

Select objects: ***select more objects or stop selecting object(s) by selecting <enter>.***

Specify base point or displacement: ***select a location (P2) (usually on the object).***

Specify second point of displacement or <use first point as displacement>: ***move the object to its new location (P3) and press the left mouse button.***

***Warning: If you press <enter> instead of actually picking a new location (P3) with the mouse, Autocad will send it into Outer Space. If this happens just select undo tool and try again.***



# DRAG

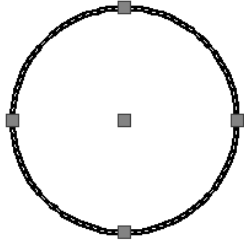
The **Drag** option allows you to quickly **move** or **copy** and object(s).

## EXAMPLE:

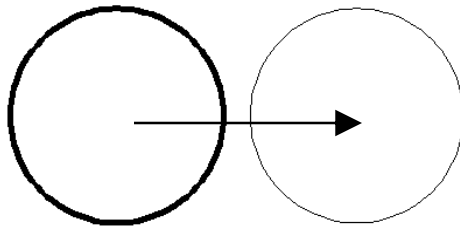
1. Draw a Circle.

2. Select the Circle.

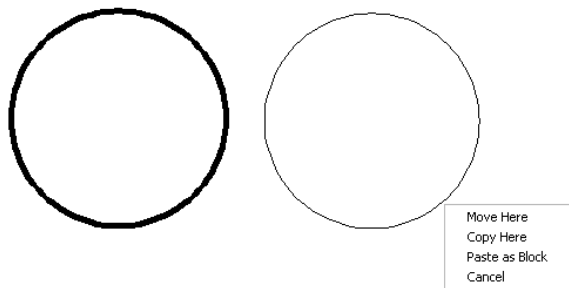
*5 little boxes appear. These are Grips and allow you to edit the object. Grips will be discussed more in future lessons.*



3. Hold the Right Mouse button down as you drag the Circle to the right.



4. When the dragged Circle is in the desired location release the Right Mouse and a options menu will appear.



5. Select **Move Here**, **Copy Here**, or **Cancel**.

**Move Here:** The original object selected will move to the new location.

**Copy Here:** The original object will remain in it's original location and a copy will appear in the new location.

**Note:** More on **Copy command** in Lesson 6.

**Paste as Block:** Discussed in future Lesson.

# NUDGE

The **Nudge** option allows you to nudge objects in orthogonal increments.

**Note:**

Snap mode affects the distance and direction in which the objects are nudged.

Nudge objects with **Snap** mode turned OFF:

Objects move two pixels at a time.

Nudge objects with **Snap** mode turned ON:

Objects are moved in increments specified by the current **Snap** spacing.

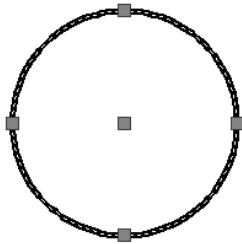
Note: to set the Increment Snap spacing refer to page 3-7.

**EXAMPLE:**

1. Draw a Circle.

2. Select the Circle.

*5 little boxes appear. These are Grips and allow you to edit the object. Grips will be discussed more in future lessons.*



3. Hold down the **Ctrl** key and press one of the **Arrow** keys ←→↑↓


**Remember:**

The distance the object moves depends on whether you have the **Snap** mode ON or OFF. (Refer to note above)

# EXPLODE

The **EXPLODE** command changes (explodes) an object into its primitive objects. For example: A rectangle is originally one object. If you explode it, it changes into 4 lines. Visually you will not be able to see the change unless you select one of the lines.

1. Select the **Explode** command by using one of the following:

**Ribbon = Home tab / Modify panel / **  
**or**  
**Keyboard = X <enter>**

2. The following will appear on the command line:

Command: `_explode`

Select objects: ***select the object(s) you want to explode.***

Select objects: ***select <enter>***.

**Before EXPLODE**



**One Object  
(Rectangle)**

**After EXPLODE**



**4 Objects  
(4 Lines)**

**(Notice there is no visible difference. But now you have 4 lines instead of 1 Rectangle)**

## **Try this:**

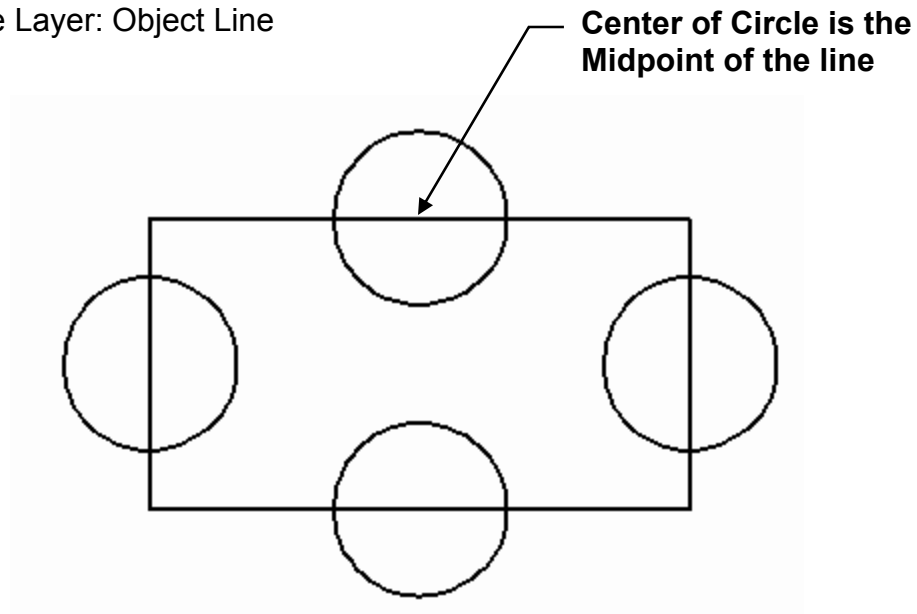
Draw a rectangle and then click on it. The entire object highlights.

Now explode the rectangle, then click on it again. Only the line you clicked on should be highlighted. Each line that forms the rectangular shape is now an individual object.

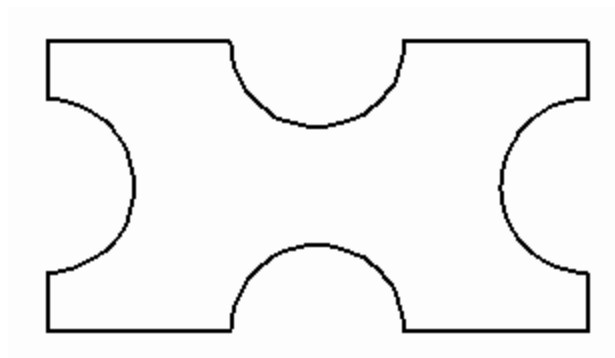
# EXERCISE 6A

## INSTRUCTIONS:

1. Start a **NEW** file using **2012-Workbook Helper.dwt**.
2. **Draw** the objects below:
  - A. Use object snap **Midpoint** to locate the center for the Circles.
  - B. **Ortho** (F8) **ON** when drawing Horizontal and Vertical lines.
  - C. Turn **Increment Snap** (F9) **ON**
  - D. Use Layer: Object Line



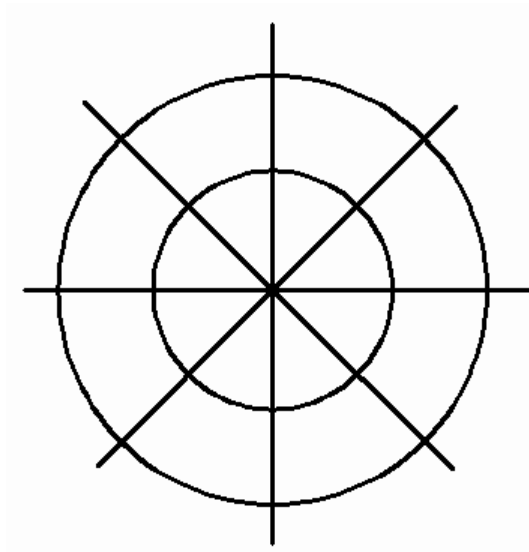
3. Trim the Circles and Rectangle to match the illustration below.
4. **Save** the drawing as: **EX6A**



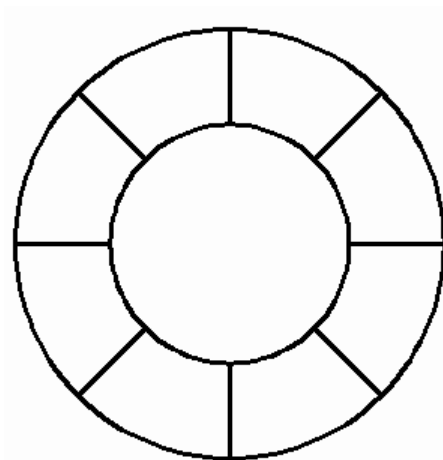
# EXERCISE 6B

## INSTRUCTIONS:

1. Start a **NEW** file using **2012-Workbook Helper.dwt**.
2. **Draw** the objects below:
  - A. **Circles** should have the same center
  - B. **Ortho (F8) ON** when drawing Horizontal and Vertical lines.
  - C. **Ortho (F8) OFF** when drawing lines on an Angle.
  - D. Turn **Increment Snap (F9) OFF**
  - E. Use Layer: Object Line



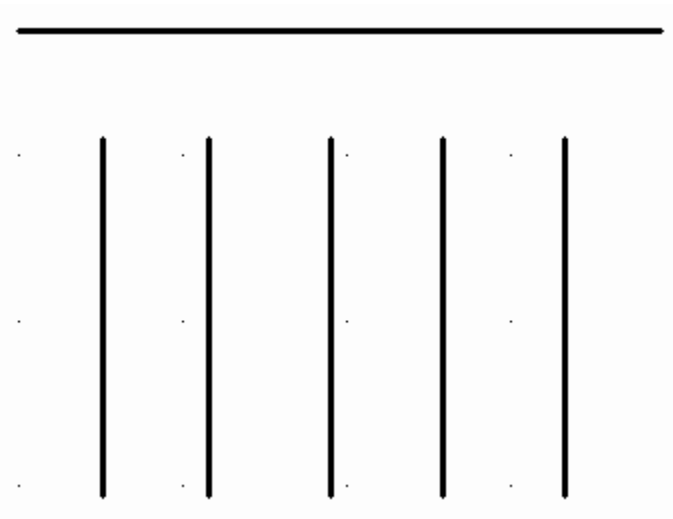
3. **TRIM** the Lines to match the illustration below.
4. **Save** the drawing as: **EX6B**



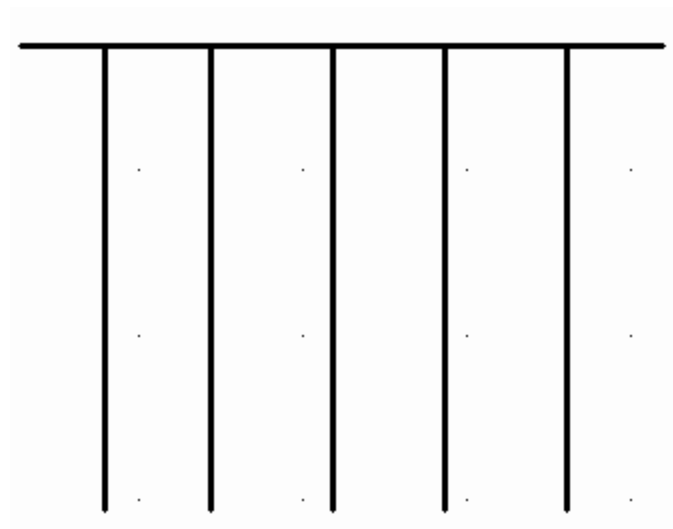
# EXERCISE 6C

## INSTRUCTIONS:

1. Start a **NEW** file using **2012-Workbook Helper.dwt**.
2. **Draw** the **Lines** below exactly as shown.
  - A. **Ortho** (F8) **ON** when drawing Horizontal and Vertical lines.
  - B. Turn **Increment Snap** (F9) **ON**
  - C. Turn **Osnap** (F3) **OFF**
  - D. Use Layer: Object Line



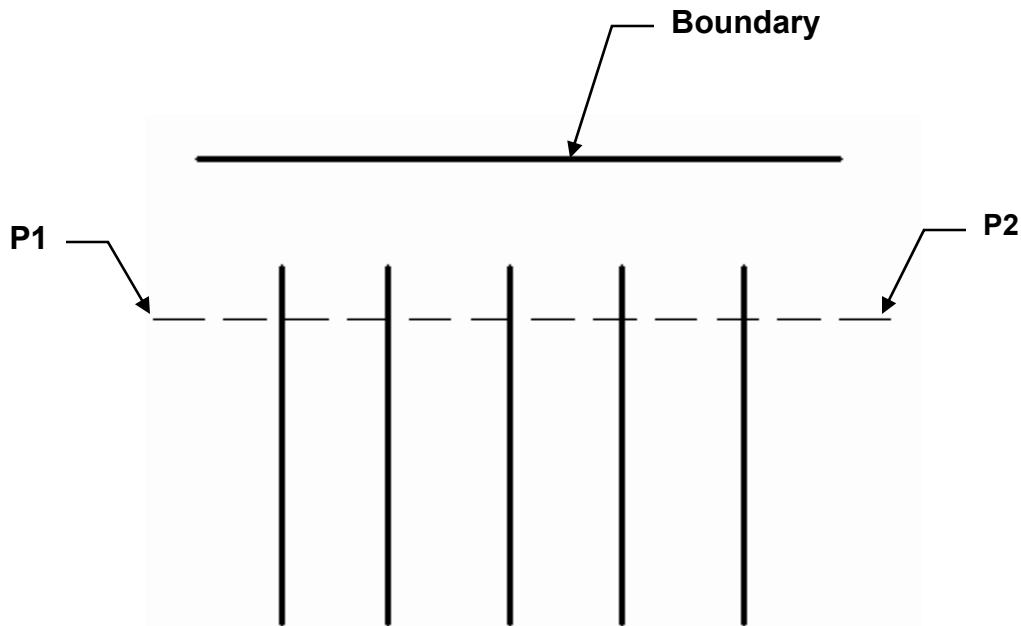
3. **Extend** the vertical lines to intersect with the horizontal (Boundary) Line as shown below.
4. **Save** the drawing as: **EX6C**



# EXERCISE 6D

## INSTRUCTIONS:

1. Start a **NEW** file using **2012-Workbook Helper.dwt**.
2. Draw the **LINES** below exactly as shown.
3. Select the “**Extend**” command.
4. Select the “**Boundary**” <enter>
5. Now instead of clicking on each vertical line, type **F** <enter>.
6. Place the cursor approximately at location **P1** and click.
7. Move the cursor to approximately location **P2** and click.
8. Press <enter> and <enter> again.
9. **Save** the drawing as: **EX6D**



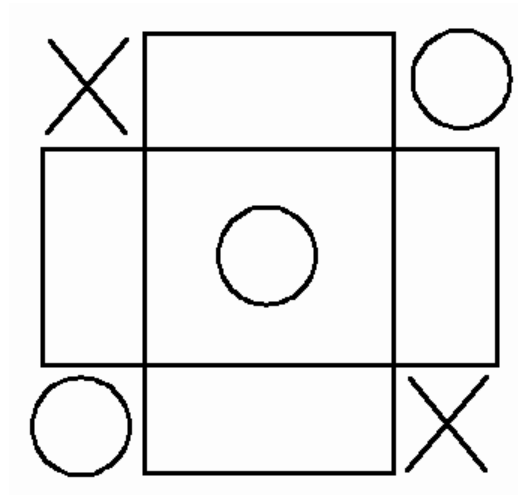
### Note:

Be careful to place P1 and P2 above the midpoint of the vertical lines. That instructs AutoCAD to extend the lines in that direction toward the boundary. If you place P1 and P2 below the midpoint of the vertical line, AutoCAD will look for a boundary in that direction. This will confuse AutoCAD because you did not select a boundary below.

# EXERCISE 6E

## INSTRUCTIONS:

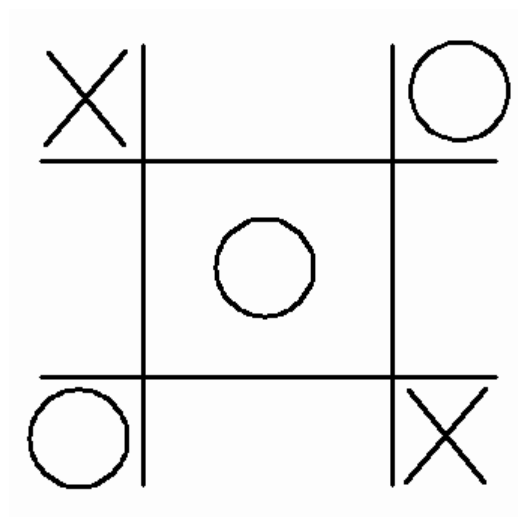
1. Start a **NEW** file using **2012-Workbook Helper.dwt**.
2. **Draw** the objects below using:  
Rectangles, Circles and Lines (for the X's)  
Use Layer: Object Line



3. Modify the drawing above to appear as the drawing shown below using:  
**Explode and Erase**

**Note: You must Explode a Rectangle before you can Erase an individual line.**

4. **Save** the drawing as: **EX6E**



# EXERCISE 6F

## INSTRUCTIONS:

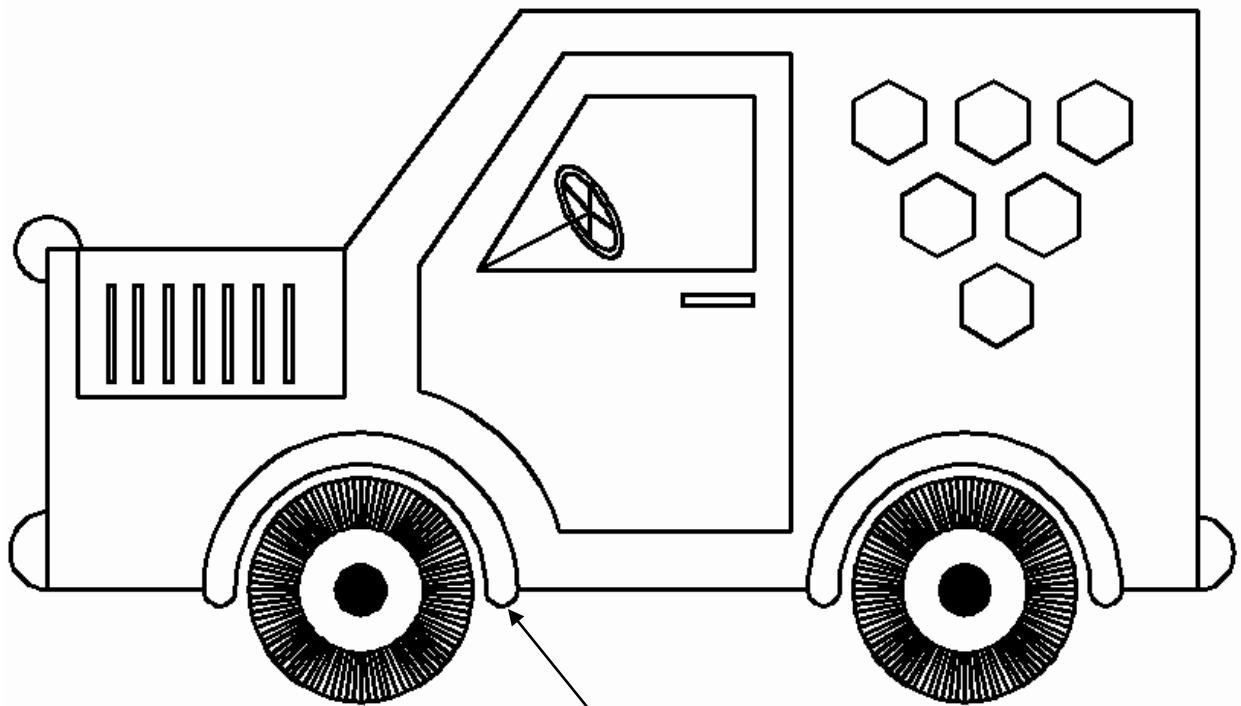
1. Start a **NEW** file using **2015-Workbook Helper.dwt**.
2. **Draw** the objects below using all of the commands you have learned in the previous lessons.

Use whatever layers you desire

3. **Save** the drawing as: **EX6F**

*Have some fun with this one. But be very accurate.*

*All objects must intersect exactly. Zoom in and take a look to make sure.*



Use 2point Circle  
and Trim

Donuts with Fill turned OFF  
(Yours may not appear  
exactly the same as shown)

**Notes:**