

# Introduction to AutoCAD 2010

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## Chapter 3 Exercise 1

1. Open **AutoCAD 2010** with a *double-click* on its shortcut icon in the Windows desktop.
2. Call the **Line** tool with a *left-click* on its tool icon in the **Home/Draw** panel. The command line shows:

**Command:** `_line` Specify first point: enter `80,230` right-click

Specify next point or [Undo]: enter `80,250` right-click

Specify next point or [Undo]: enter `260,250` right-click

Specify next point or [Close/Undo]: enter `260,230` right-click

Specify next point or [Close/Undo]: right-click

**Command:** right-click

**LINE** Specify first point: enter `260,90` right-click

Specify next point or [Undo]: enter `260,70` right-click

Specify next point or [Undo]: enter `80,70` right-click

Specify next point or [Close/Undo]: enter `80,90` right-click

Specify next point or [Close/Undo]: right-click

**Command:**

3. Call the **Arc/Start, Center, End** tool with a *left-click* on its tool icon in the **Home/Draw** panel. The command line shows:

**Command:** `_arc` Specify start point of arc or [Center]:  
enter `80,90` right-click

Specify second point of arc or [Center/End]: `_c` Specify center point of arc: enter `110,160` right-click

Specify end point of arc or [Angle/Chord/Length]: enter `80,230` right-click

**Command:** right-click

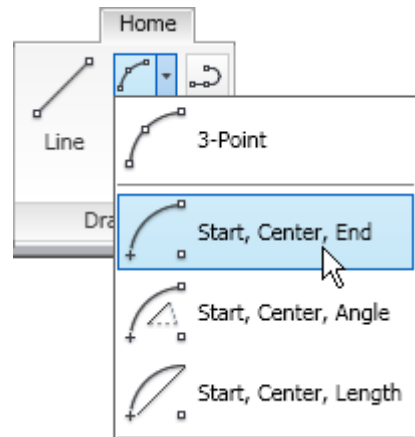
**ARC** Specify start point of arc or [Center/End] `_c` Specify center point of arc: enter `260,230` right-click

Specify second point of arc or [Center/End]: enter `230,160` right-click

Specify end point of arc [Angle/Chord/Length]: enter `260,90` right-click

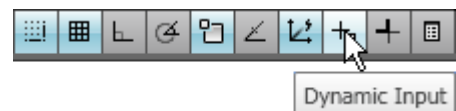
**Command:**

4. Save your drawing to the file name `3_Exercise01.dwg` to your floppy disk.
5. *Left-click* the **Close** button of the drawing window.



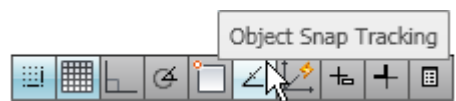
## Chapter 3 Exercise 2

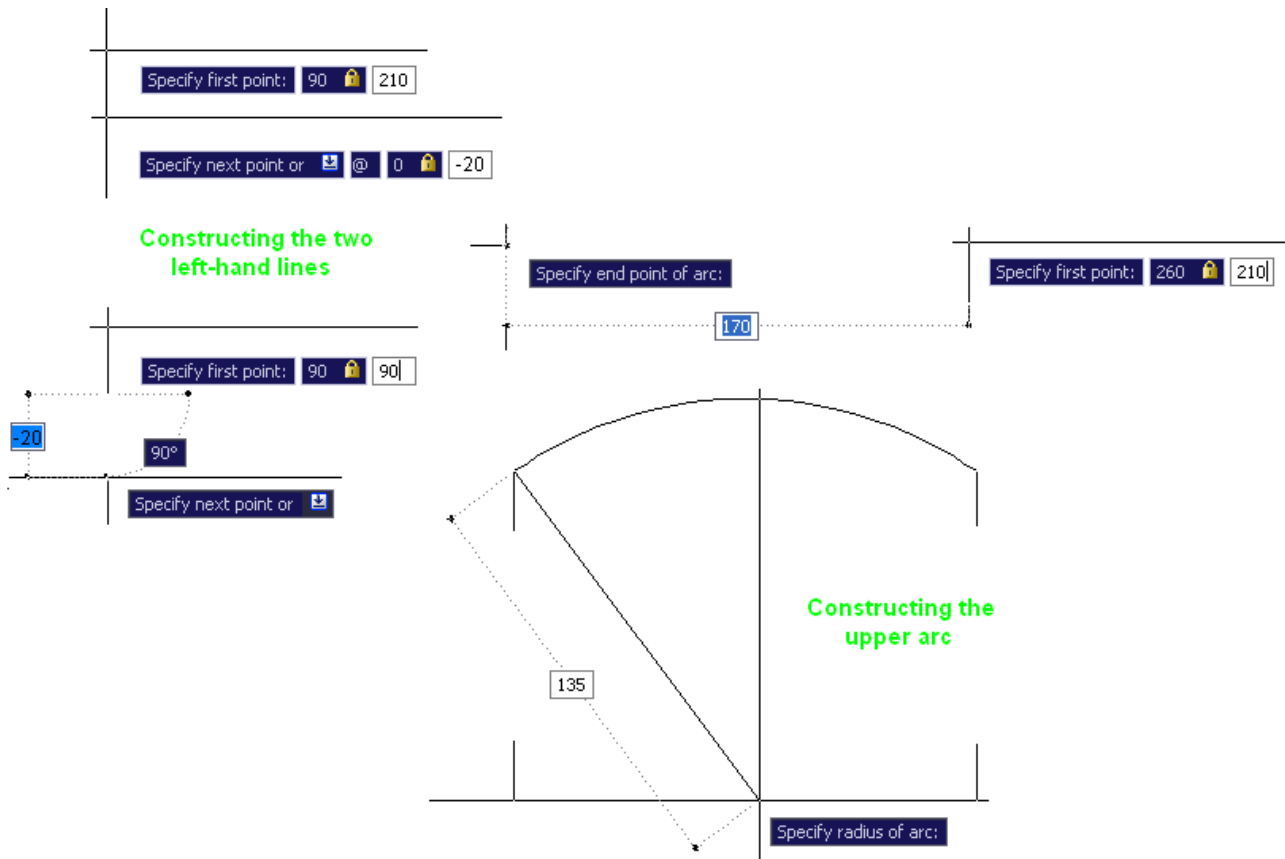
1. Open `acadiso.dwt` - *left-click* **New...** in the **Quick Access** toolbar.
2. *Left-click* both the **Osnap Mode** and **Dynamic Input** buttons in the status bar to set both the features on.
3. Call the **Line** tool and construct four lines using the **Dynamic Input** system:  
From `90,210` to `90,190`; from `90,90` to `90,70`; from `260,210` to `260,190`; from `260,90` to `260,70`.
4. Call the **Arc** tool and construct the upper arc using **Dynamic Input** (see illustration on the next page).
5. Construct the other three arcs.



### Notes

- (a) Arcs must be drawn anticlockwise (counter-clockwise).
- (b) Note the use of the **Osnaps** in this example. *Click* on the **Object Snap Tracking** button and a point *picked* near the end of an object will snap to that point.





6. Save your drawing to a file name **3\_Exercise02.dwg** on your floppy disk. **Note:** a floppy disk will save all the drawing files for answers to exercises in Chapters 2, 3 and 5. Change to a new disk for further exercises.
7. Close the drawing window with a *left-click* on its **Close** button.

### Chapter 3 Exercise 3

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Call the **Ellipse/Axis, End** - *click* on its tool icon in the **Home/Draw** panel The command line shows:

**Command:** `_ellipse`

**Specify axis endpoint of ellipse or [Arc/Center]:** *enter 80,230 right-click*

**Specify other endpoint of ellipse:** *enter 290,230 right-click*

**Specify distance to other axis or [Rotation]:** *enter 20 right-click*

**Command:** *right-click*

**ELLIPSE Specify axis endpoint of ellipse:** *enter 80,75 right-click*

**Specify other endpoint of ellipse:** *enter 290,75 right-click*

**Specify distance to other axis or [Rotation]:** *enter 20 right-click*

**Command:**

3. Call the **Arc** tool with a *left-click* on its tool icon in the **Draw** toolbar. The command line shows:

**Command:** `_arc` **Specify start point of arc:** *enter 80,230 right-click*

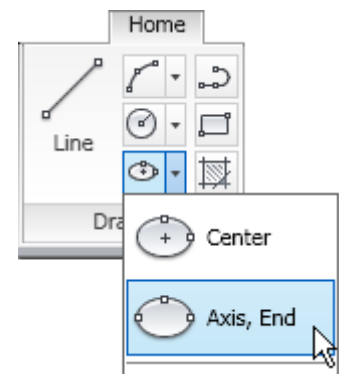
**Specify second point of arc or [Center/End]:** *enter e (End) right-click*

**Specify end point of arc:** *enter 80,75 right-click*

**Specify center point of arc or [Angle/Direction/Radius]:** *enter r (Radius) right-click*

**Specify radius of arc:** *enter 130 right-click*

**Command:** *right-click*



**ARC Specify start point of arc:** *enter 290,75 right-click*

**Specify second point of arc or [Center/End]:** *enter e (End) right-click*

**Specify end point of arc:** *enter 290,230 right-click*

**Specify center point of arc or [Angle/Direction/Radius]:** *enter r (Radius) right-click*

**Specify radius of arc:** *enter 130 right-click*

**Command:**

4. Call the **Line** tool with a *left-click* on its tool icon in the **Home/Draw** panel
5. Construct a line from **185,210** to **185,95**.
6. Save your drawing with the file name **3\_Exercise03.dwg** to your floppy disk.
7. *Left-click* the **Close** button of the drawing window.

## Chapter 3 Exercise 4

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Make sure **Snap** is set on, if it is not on press **F9** key or *left-click* the **Snap Mode** button in the status bar.
3. Make sure **Grid** dots are showing, if not press **F7** key or *left-click* the **Grid Display** button.
4. Make sure **Ortho** is on, if not either press the **F8** key or *left-click* the **Ortho Mode** button.
5. Call the **Line** tool by *entering* **l** at the command line which then shows:  
**Command:** *enter l (for Line) right-click*  
**LINE Specify first point:** *left-click* at the point **60,230** (any other point would be suitable)  
**Specify next point or [Undo]:** *drag* the line to the right and *enter* **240** and *right-click*  
**Specify next point or [Undo]:** *drag* the line downwards and *enter* **150** and *right-click*  
**Specify next point or [Close/Undo]:** *drag* the line to the left and *enter* **240** and *right-click*  
**Specify next point or [Close/Undo]:** *enter* **c** (Close) *right-click*  
**Command:**
6. Call the **Circle** tool by *entering* **c** at the command line which then shows:  
**Command:** *enter c (for Circle) right-click*  
**CIRCLE Specify center point for circle or [3P/2P/Ttr (tan, tan, radius):** *pick* the point **80,210**  
**Specify radius of circle or [Diameter]:** *enter* **d** *right-click*  
**Specify diameter of circle <0>:** *enter* **20** *right-click*  
**Command:**
7. Repeat at each of the points **20** units both ways inside each corner.
8. Call the **Ellipse** tool by *entering* **el** at the command line which then shows:  
**Command:** *enter el (for Ellipse) right-click*  
**ELLIPSE Specify axis endpoint of ellipse or [Arc/Center]:** *pick* a point in line with the boundaries of the two left-hand circles and central to the rectangle  
**Specify other endpoint of axis:** *pick* a point in line with the boundaries of the two right-hand circles and central to the rectangle  
**Specify distance to other axis or [Rotation]:** *pick* a point in line with the boundaries of the two upper circles  
**Command:**
9. Save your drawing with the file name **3\_Exercise04.dwg** to your floppy disk.
10. *Left-click* the **Close** button of the drawing window.

### Note:

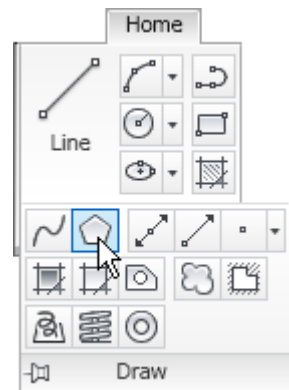
There are five methods of calling tools - from a Ribbon panel, with a *left-click* on the tool icon; by *entering* an abbreviation; by *entering* the full name; by selection from drop-down menus.

## Chapter 3 Exercise 5

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Construct the four outer ellipses, the first with axes **110,250** and **250,250**; the second with axes **110,110** and **250,110**; the third with axes **110,110** and **110,250**; the fourth with axes **250,110** and **250,250**. For each of the four axes, the response to the prompt  
**Specify distance to other axis:** will be to *enter 15* (half the minor axis) and *right-click*.
3. The two inner ellipses are constructed in a similar manner. The coordinates of the ends of the axes must be calculated arithmetically, but the distance to the **other axis** will also be **15** as for the outer ellipses.
4. Save your drawing to the file name **3\_Exercise05.dwg** to your floppy disk.
5. *Left-click* the **Close** button of the drawing window.

## Chapter 3 Exercise 6

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Make sure **Ortho** is set on - either using **F8** or the **Ortho Mode** button in the status bar.
3. Call the **Rectangle** tool by *entering* **rec** at the command line which then shows:  
**Command: \_rectang**  
**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *pick a suitable point*  
**Specify other corner point or [Area/Dimensions/Rotation]:** *enter d right-click*  
**Specify length for rectangles <0>:** *enter 65 right-click*  
**Specify width for rectangles <0>:** *enter 65 right-click*  
**Specify other corner point or [Area/Dimensions/Rotation]:** *left-click*  
**Command:**
4. Call the **Polygon** tool with a *left-click* on its tool icon in the **Home/Draw** panel flyout. The command line shows:  
**Command: \_polygon right-click**  
**Enter number of sides <4>:** *enter 6 right-click*  
**Specify center of polygon or [Edge]:** *enter e (for Edge) right-click*  
**Specify first endpoint of edge:** *pick bottom right-hand corner of rectangle*  
**Specify second endpoint of edge:** *pick bottom left-hand end of rectangle*  
**Command:** *right-click*
4. Add the other three polygons in a similar manner.
5. Save your drawing with the file name **3\_Exercise06.dwg** to your floppy disk.
6. *Left-click* the **Close** button of the drawing window.



## Chapter 3 Exercise 7

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Make sure **Osnap** is set on - either by pressing **F3** or by depressing the **Osnap Mode** button in the status bar with a *left-click*. **Snap** and **Ortho** are best set off for this exercise.
3. Call the **Polygon** tool with a *left-click* on its tool icon in the **2D Draw** control panel. The command line shows:  
**Command: \_polygon right-click**  
**Enter number of sides <4>:** *enter 6 right-click*  
**Specify center of polygon or [Edge]:** *enter e (for Edge) right-click*  
**Specify first endpoint of edge:** *pick a point on screen*  
**Specify second endpoint of edge:** *drag to the right and enter 30 and right-click*  
**Command:** *right-click*

**POLYGON**

**Enter number of sides <6>:** *right-click*

**Specify center of polygon or [Edge]:** *enter e (for Edge) right-click*

**Specify first endpoint of edge:** *pick bottom right-hand corner of polygon*

**Specify second endpoint of edge:** *pick bottom left-hand end of polygon*

4. Add the other polygons in a similar manner.
5. Save your drawing with the file name **3\_Exercise07.dwg** to your floppy disk.
6. *Left-click* the **Close** button of the drawing window..

## Chapter 3 Exercise 8

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Call the **Rectangle** tool either with a *left-click* on its tool icon in the **Home/Draw** panel, or by *entering* **rec** at the command line. The command line shows:

**Command:** **\_rectang**

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *enter c (for Chamfer) right-click*

**Specify first chamfer distance for rectangles <0>:** *enter 45 right-click*

**Specify second chamfer distance for rectangles <45>:** *right-click*

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *pick a suitable point*

**Specify other corner point or [Dimensions]:** *enter d right-click*

**Specify length for rectangles <0>:** *enter 160 right-click*

**Specify width for rectangles <0>:** *enter 105 right-click*

**Specify other corner point or [Area/Dimensions/Rotation]:** *left-click*

**Command:**

3. Make sure **Osnaps** are set on - press **F3** or *left-click* **OSNAP** in the status bar.
4. Call **Rectangle** tool again. The command line shows:

**Command:** **\_rectang**

**Current rectangle modes: Chamfer = 45 x 45**

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *Snap on to a suitable corner of the rectangle already on screen*

**Specify first chamfer distance for rectangles <0>:** *enter 45 right-click*

**Specify second chamfer distance for rectangles <45>:** *right-click*

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *pick a suitable point*

**Specify other corner point or [Dimensions]:** *enter d right-click*

**Specify length for rectangles <0>:** *enter -50 right-click*

**Specify width for rectangles <0>:** *enter 15 right-click*

**Specify other corner point or [Area/Dimensions/Rotation]:** *left-click*

**Command:**

**Note:**

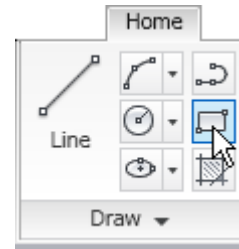
The **-50** (minus **50**) in the above sequence.

5. Repeat with suitable dimensions for the other three rectangles added to the main chamfered rectangle.

**Note:**

The chamfer distances are too large to affect the smaller rectangles. If this were not so, the chamfers would have to be changed to **0** for each chamfer distance.

6. Save your drawing with the file name **3\_Exercise08.dwg** to your floppy disk.
7. *Left-click* the **Close** button of the drawing window.



## Chapter 3 Exercise 9

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Call the **Line** tool and construct eight lines as follows (the first coordinate has been selected as suitable):

**130,240 to 210,240; 130,100 to 210,100; 250,200 to 250,140; 90,200 to 90,140; 140,220 to 200,220; 140,120 to 200,120; 110,90 to 110,150; 230,190 to 230,150.**

3. Make sure **Osnap** is on and join the ends of the inner lines to form the chamfers.

4. Call the **Arc** tool by *entering a* at the command line. Remembering that the default action of arcs, circles, etc. is anticlockwise make the following *entries* at the command line:

**Command: \_arc Specify start point of arc or [Center]:**

*pick an end of one of the outer lines*

**Specify second point of arc or [Center/End]:** *enter e (End) right-click*

**Specify end point of arc:** *pick the end to which the arc is to be constructed*

**Specify center point of arc or [Angle/Direction/Radius]:**

*enter r (Radius) right-click*

**Specify radius of arc:** *enter 60 right-click*

**Command:**

5. Repeat to form all four arcs.

6. Call the **Edit Polyline** tool, either by *entering pe* at the command line, or by a *left-click* on The **Edit Polyline** icon in the **Home/Modify** panel flyout. The command line shows:

**Command:** *enter pe right-click*

**PEDIT Select polyline or [Multiple]:** *enter m right-click*

**Select objects:** *window the whole drawing 16 found*

**Convert Lines and Arcs to polylines [Yes/No]:** *enter y (Yes) right-click*

**Enter an option [Close/Open/Join/Fit/Spline/Decurve/Ltype gen/Undo]:** *enter w right-click*

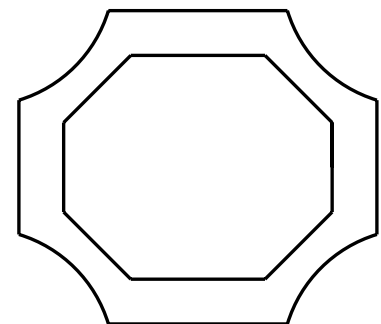
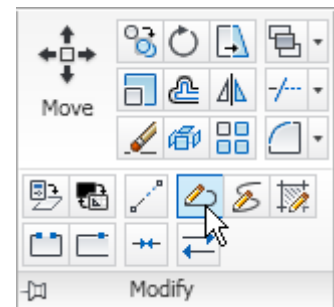
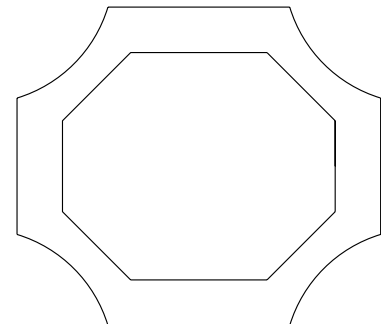
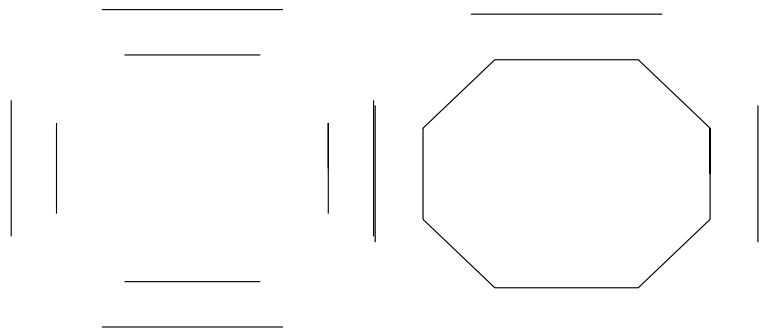
**Specify new width for all segments:** *enter 1 right-click*

**Enter an option [Close/Open/Join/Width/Fit/Spline/Decurve/Ltype gen/Undo]:** *right-click*

**Command:**

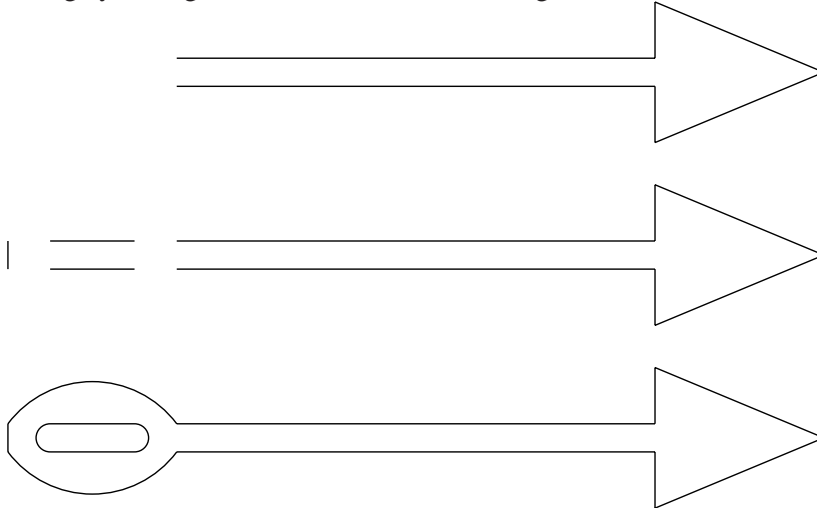
7. Save your drawing to the file name **3\_Exercise09.dwg** to your floppy disk.

8. *Left-click* the **Close** button of the drawing window.

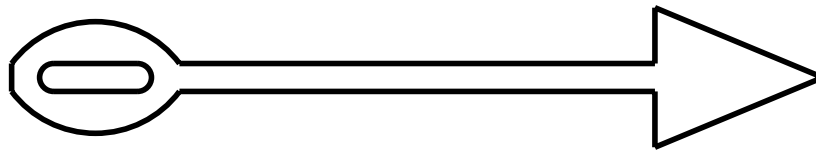


## Chapter 3 Exercise 10

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Call the **Line** tool, either with a *left-click* on its tool icon in the **Home/Draw** panel or by *entering l* at the command line.
3. Construct the lines of the drawing in the order shown in the first two diagrams below.
4. Call the **Arc** tool, either with a *left-click* on its tool icon in the **Home/Draw** panel or by *entering a* at the command line.
5. Complete the drawing by adding arcs as shown in the third diagram below. Remember the anticlockwise rule.



6. Call the **Edit Polyline** tool by *entering pe* at the command line and, using the **Multiple** prompt, change the lines and arcs of the drawing into polylines of width 2.
7. Save your drawing with the file name **3\_Exercise10.dwg** to your floppy disk.
8. *Left-click* the **Close** button of the drawing window.



## Chapter 3 Exercise 11

1. Open **acadiso.dwt** - *left-click* **New...** in the **Quick Access** toolbar.
2. Construct the rectangle. The command line sequences should show as follows when drawing this particular rectangle.

**Command:** `_rectang`

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *enter c right-click*

**Specify first chamfer distance for rectangles <0>:** *enter 20 right-click*

**Specify second chamfer distance for rectangles <20>:** *right-click*

**Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:** *enter 50,230 right-click*

**Specify other corner point or [Dimensions]:** *enter 280,100 right-click*

**Command:**

3. Add the lines using the **Line** tool.
4. Call the **Polyline Edit** tool by *entering pe* at the command line. Then when the **Pedit** command line sequences appear:

Left-click the rectangle and in response to the prompt line:

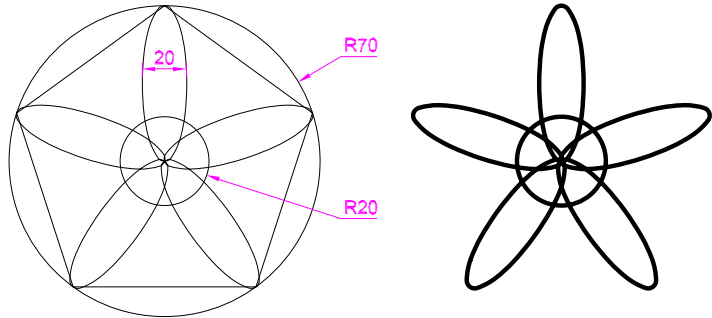
**Enter an option [Close/Join/Width/Edit vertex/Fit/Spline/Decurve/Ltype gen/Undo]:** enter w right-click

**Specify new width for all segments:** enter 5 right-click

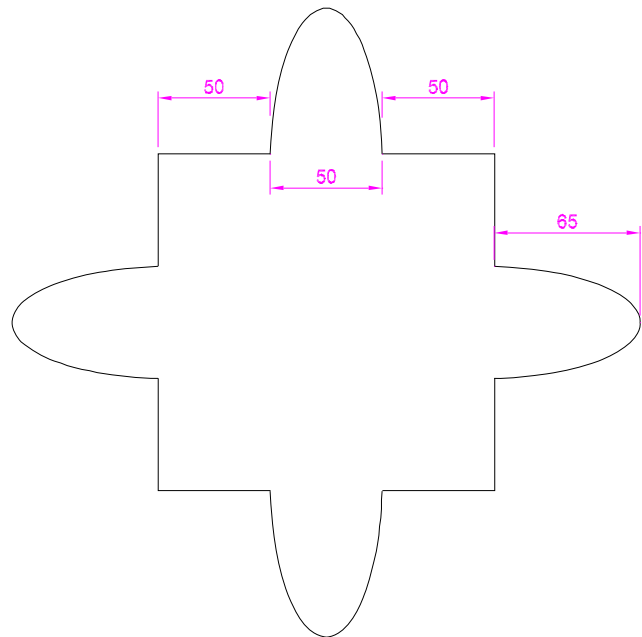
5. Call **Pedit** again and in the same manner change the width of the inner line shape to **10** and the outer lines to a width of **5**.
6. Save your drawing to the file name **3\_Exercise11.dwg** to your floppy disk.
7. Left-click the **Close** button of the drawing window.

### Additional exercises

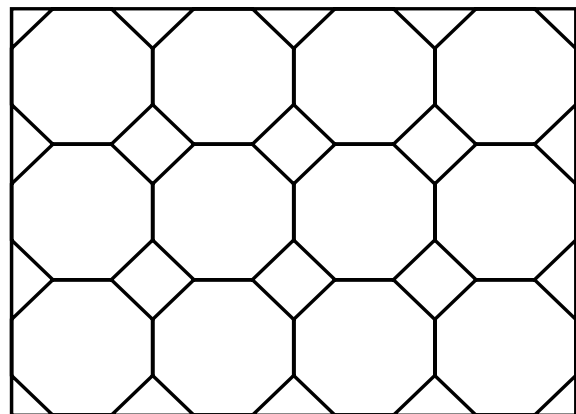
1. Construct the pentagon inscribed within a circle and add ellipses with one end of their major axes at the centre of the circle and the other end at each of the vertices of the pentagon.. Add the **R20** circle. Erase the larger circle and pentagon as shown in the right-hand drawing.



2. Construct the given outline using the **Line** and **Ellipse Arc** tools.

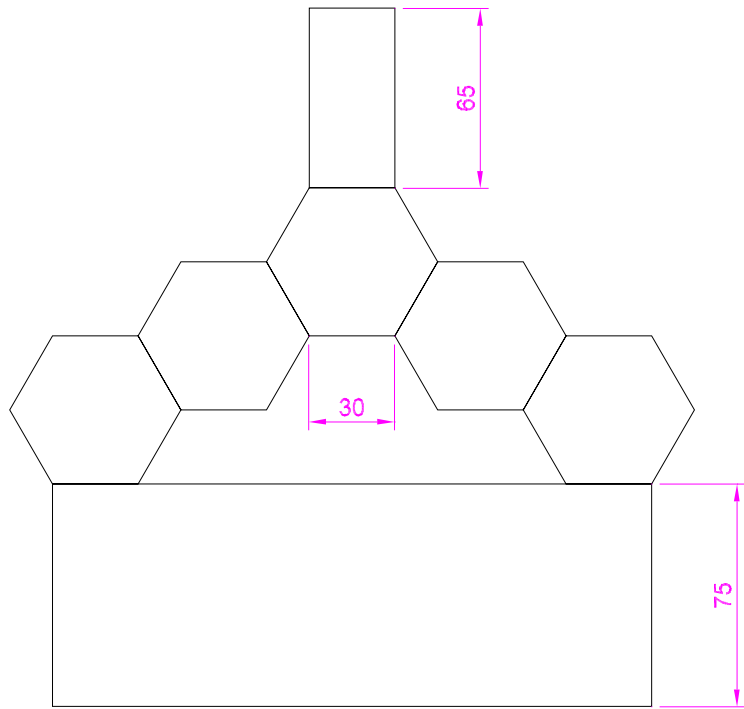


3. Each of the octagons have edge lengths of **25**. Construct the drawing as shown and when completed using **Polyline Edit** form plines of width = **1.5**.

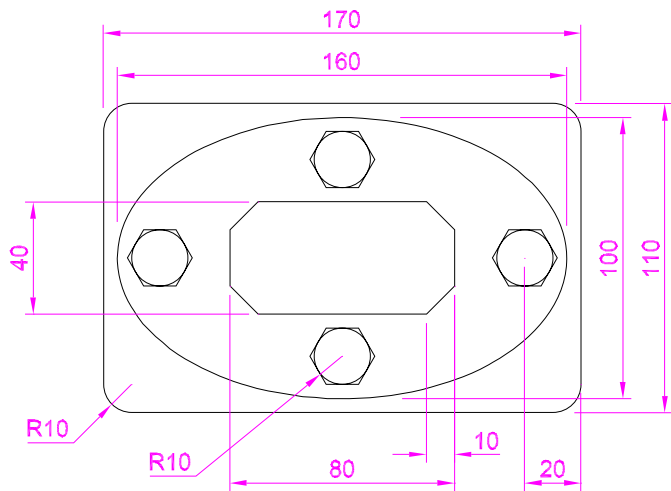




4. Construct the drawing as shown using the **Polygon** and **Rectangle** tools.



5. Construct an accurate copy of the drawing.



### Multiple choice questions

- The **Arc** tool can be called by *entering* the following abbreviation at the command line:
  - ar
  - a
  - ac
  - There is no abbreviation. The name arc must be *entered* in full.
- The set variable **PELLIPSE** can be set to either **0** or **1** when it allows the following actions:
  - When set to **0** the **Edit Polyline** tool to be used on ellipses
  - When set to **1** the **Edit Polyline** tool to be used on ellipses
  - When set to **0** it allows ellipses to be drawn with the major axis at any angle
  - When set to **0** ellipses become polylines.
- When saving an AutoCAD 2010 drawing it is filed with the extension:
  - \*.drwg
  - \*.dwg
  - \*.dwt
  - \*dg.

4. The **Dynamic Input (DYN)** system can be toggled on/off by pressing which key of the keyboard:
- (a) **F6**
  - (b) **F7**
  - (c) **F12**
  - (d) **F3**
5. What is the function of *entering commandline* at the keyboard:
- (a) It enables the command line to be used for *entering* command
  - (b) It brings back the command palette when it has been hidden
  - (c) It can only be used when **DYN** is set on to allow Dynamic Input to work
  - (d) It places the command palette at the bottom of the screen
6. The **Polyline Edit** tool can only be used when working with polylines:
- (a) True
  - (b) False