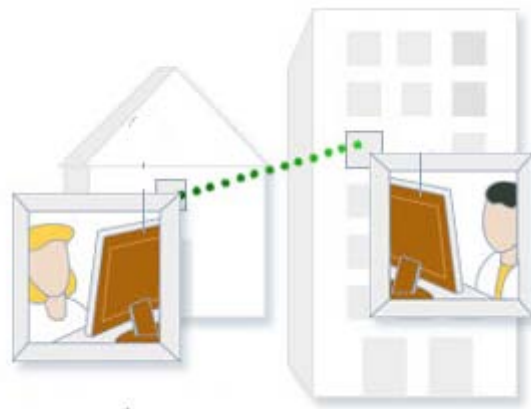


Technology University
Building and Constructions Engineering Department
Computers Principles-First Class

AUTOCAD 2009

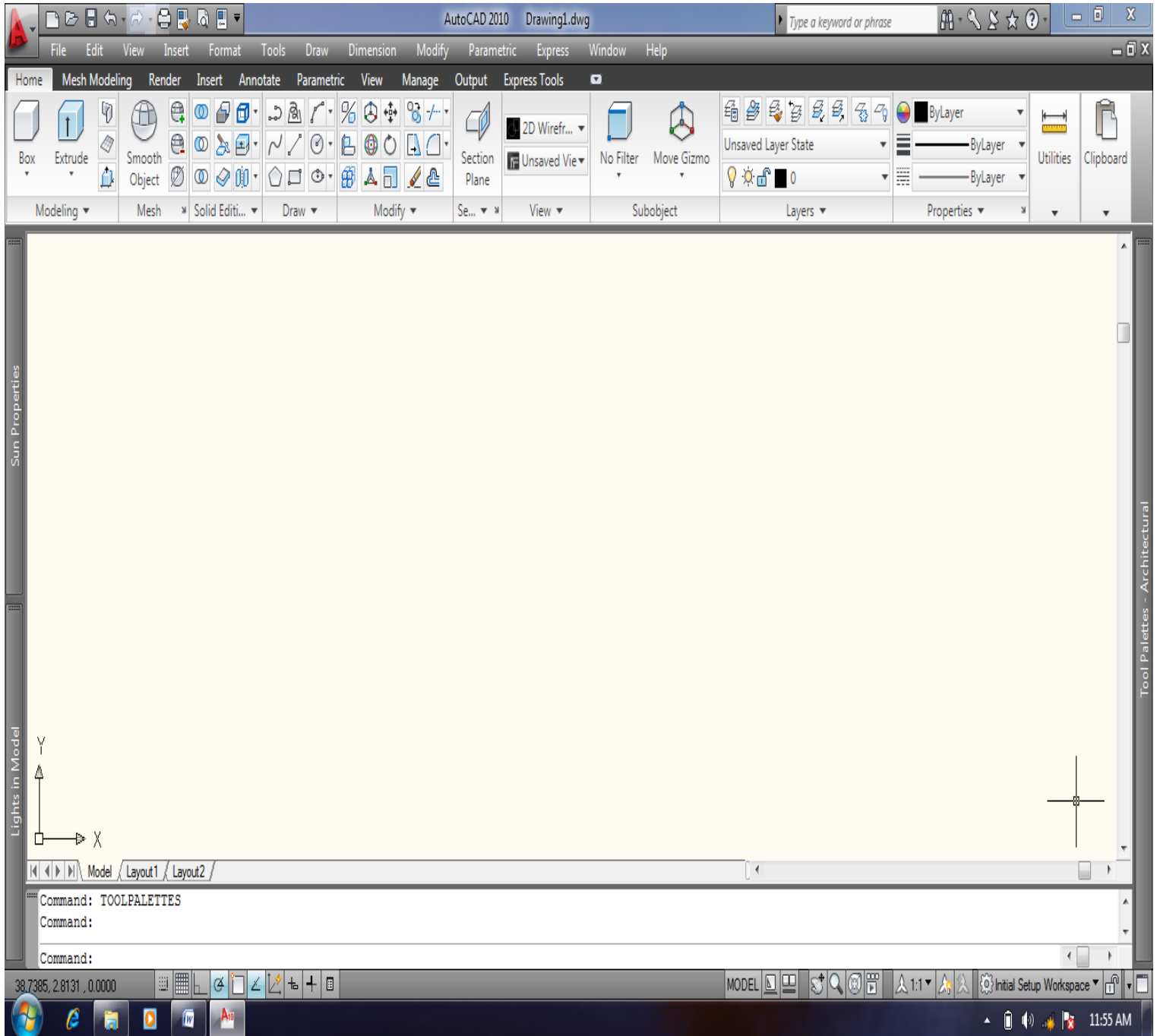


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2012


AutoCAD

AutoCAD provides countless methods and tools for producing, viewing, and editing 2- dimensional drawings and 3- dimensional models. The software permits designers, drafters, engineers, and others to create , revise, model, and document industrial parts and assemblies for prototyping, model making, and manufacturing around the world, organizations also use AutoCAD for the design of maps, buildings, bridges, factories, and about every product imaginable, ranging from car parts and stereo equipment to snow skis and cellular phones.

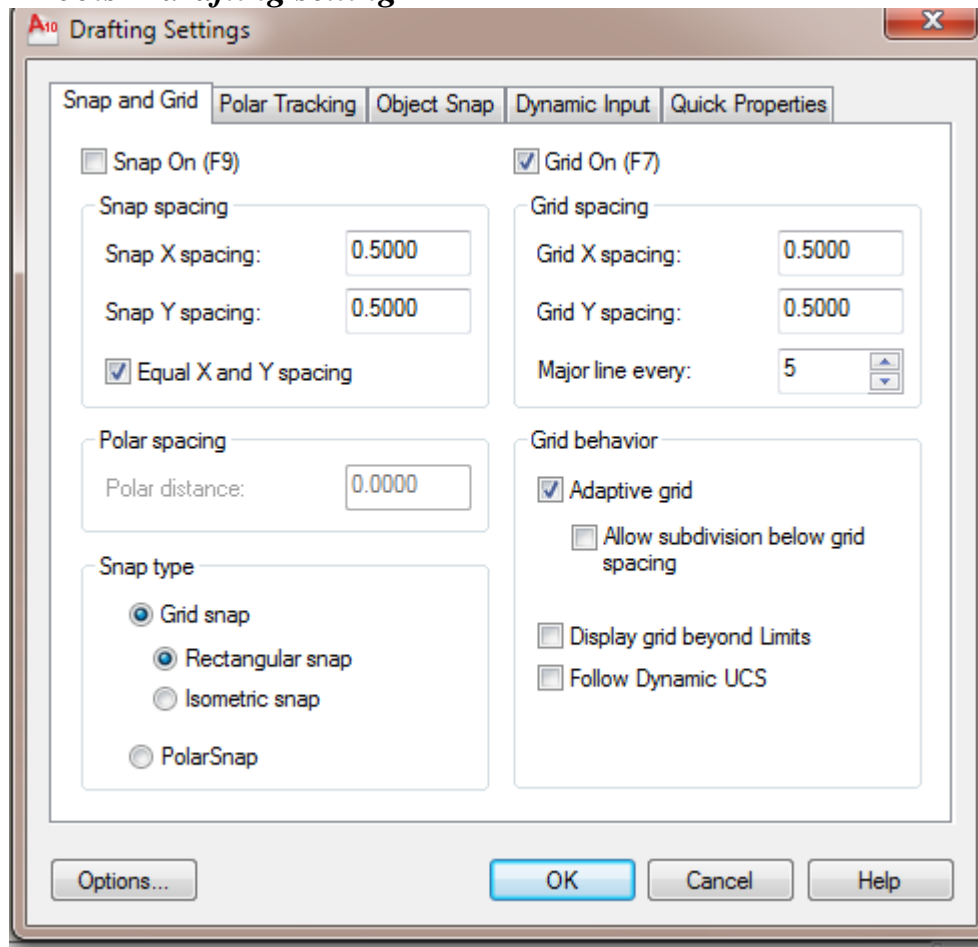


The tools used to assist in accuracy of the drawing:

Alignment Grid


The grid command allows you to set an alignment grid of dots of any desired spacing, making it easier to visualize distances and drawing size. you can turn the grid on and off by pick the grid button  located in the status bar or(by pressing Ctrl+g or the F7 function key).The drafting setting dialog box permits you to review and make changes to the grid settings:

- **Menu bar** ⇒ **Tools** ⇒ **drafting setting**




Snap grid

The snap grid is similar to the visual grid, but it is an invisible one. You cannot see the snap feature, but you can see the effects of it as you move the crosshairs. It is like a set of invisible magnetic points. The crosshairs jump from point to point as you move the pointing device. This allows you to layout drawings quickly, yet you have the freedom to toggle snap off at any time.


Pick the snap button  in the status bar to turn on the snap grid ,(or pressing Ctrl+b or the F9 function key).

The Ortho Mode


Ortho short for orthogonal, allows you to draw horizontal or vertical lines quickly and easily.

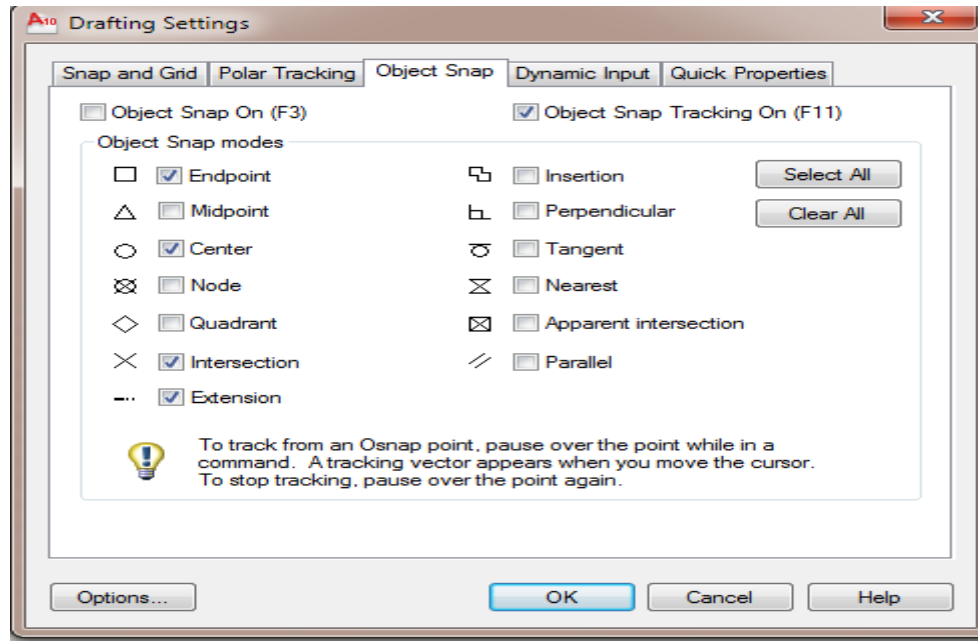
Ortho is on when the Ortho button  on the status bar is depressed. You can toggle Ortho on and off by clicking the Ortho button.(or press F8 function key).

Polar


Polar makes it easy to draw lines at regular angular increments, such as 30,45,or 90 degree. Using the F10 key or polar button  toggles polar tracking on or off.

Object Snap (Osnap)


AutoCAD provides a capability called "object snap" , or OSNAP for short, that enables you to "snap" to existing object end points, midpoints, centers, intersections, etc. available object snap mode are illustrated below:



Object Snap Tracking (Otrack)

Object snap tracking is active when the alignment paths appear from one or more acquired object snaps. This feature is a part of AutoCAD's Auto tracking. You can toggle Auto Tracking on and off with the Otrack button  on the status bar or by toggling F11.

DYN

DYN, or dynamic input, is a feature that helps you visualize and specify coordinate values, angular values when drawing lines, arcs, circles, etc. DYN may display absolute Cartesian coordinates (X and Y values) or relative polar coordinates (distance and angle) depending on the current command prompt and the setting you prefer. Pick the DYN button  in the status bar to turn on the dynamic, (or press the F12 function key).

LWT

LWT short of line weight produces the line weight settings dialog box, this dialog box assigns line weights to objects.

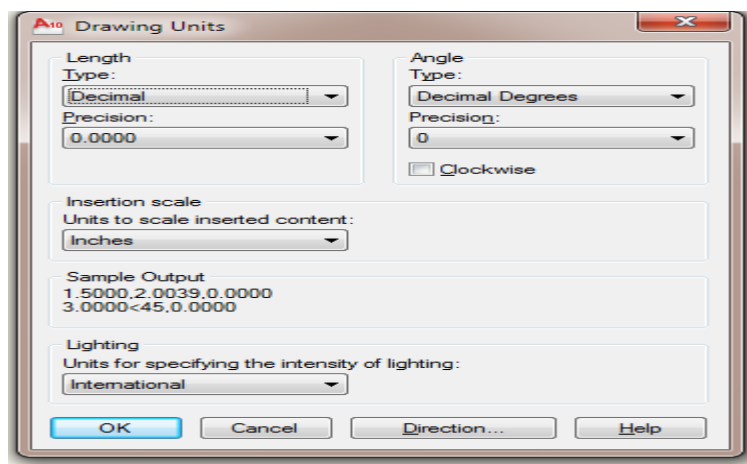
Model

Model Space used to construct engineering model where paper space used to print or draw engineering model.

Units

The units command opens dialog box to determine measurement units for drawing angles and direction and precision. Access the command by:

- **Menu bar: format \Rightarrow units**



- **Length type:** determine length types (scientific, decimal, engineering, architectural, fractional).
- **Angle type.** Determine angle type. (the default decimal degree).
- **Precision.** determine accuracy of angles and lengths. Precision is the number of places to the right of the decimal to display.
- **Clock wise** control angle direction.

Limits

Limits used To determine the limits of board. To access the command by:

- **Menu bar** ⇒ **format** ⇒ **Drawing limits**

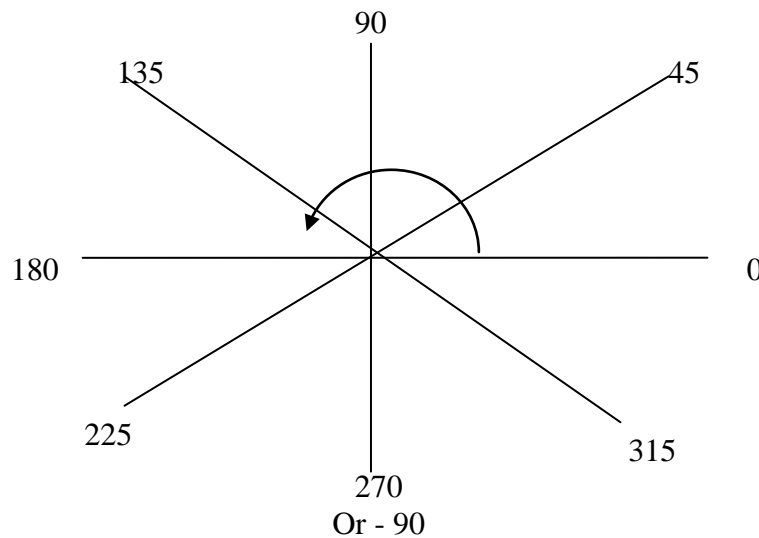
Specify lower left corner or [on / off]<0.0000,0.0000>:

Specify upper right corner <420,297>:

Angles in AutoCAD Programs

Angles measure sets the direction for angle 0 .east (x positive) is the AutoCAD default.

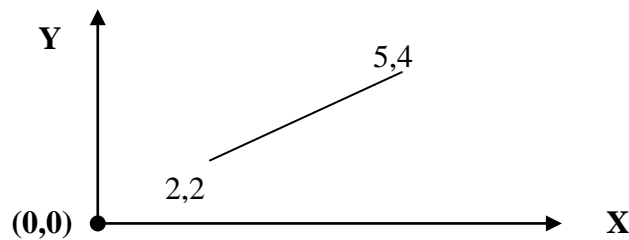
(select clock wise from units dialog box if you want to change the AutoCAD default setting for measuring angles)



Method of Entering Coordinate

1. (Absolute Cartesian Coordinate). Example: 7,3
2. (Relative Cartesian Coordinate). Example :@7,3
3. (Absolute Polar Coordinate). Example :6<45
4. (Relative Polar Coordinate). Example :@6<45

Example:



1. Draw Line using Absolute Cartesian Coordinate System.

Command line : Line

Specify start Point:2,2

Specify next Point: 5,4

The length of line calculated from original point (0,0)

2. Draw Line using Relative Cartesian Coordinate System.

Command line: Line

Specify start Point:2,2

Specify next Point: @3,2

The length of line calculated from point (2,2)

3. Draw Line using Absolute Polar Coordinate System

Command line: Line

Specify start Point:2,2

Specify next Point: 6.40<38.65

The length of line calculated from original point (0,0) using fethagorian triangle as following:

$$L = \sqrt{X^2 + Y^2} = \sqrt{5^2 + 4^2} = 6.40$$

The angle is calculated as following:

$$\sigma = \frac{4}{5} = 0.8, \text{Tan}^{-1}(0.8) = 38.65$$

4. Draw Line using Relative Polar Coordinate System

Command line: Line

Specify start Point:2,2

Specify next Point: @3.60<33.69

The length of line calculated from point (2,2) using fethagorian triangle as following:

$$L = \sqrt{X^2 + Y^2} = \sqrt{3^2 + 2^2} = 3.60$$

The angle is calculated as following:

$$\sigma = \frac{2}{3} = 0.66, \text{Tan}^{-1}(0.66) = 33.69$$

Methods of Zooming

Zoom: zooming does not change the size of the drawing objects, zooming change only the display of objects.

- **Real time** :Real time is the default option of zoom. if you type zoom ,just press enter to activate the real time option. you can type Rzoom to invoke this option directly.
- **Window** :to zoom with a window is to draw a rectangular window around the desired viewing area. The windowed area is magnified to fill the screen.
- **All**, or enter Z and A at the key board. AutoCAD zooms the drawing to its original size.
- **Extents**, or enter Z and E at the keyboard. AutoCAD zooms the drawing as large as possible while still showing the entire drawing on the screen.
- **Scale**: this option allows to enter a scale factor for the desired display.
- **In**: zoom in magnifies the current display by a factor of 2X.
- **Out** :zoom out makes the current display smaller by a factor of 0.5X.
- **Center** :first specify a location as the center of the zoomed area. Then specify either a magnification factor, a height value for the resulting display, or pick two points forming a vertical to indicate the height for the resulting display.
- **Previous**: selecting this option automatically changes to the previous display.

Pan:Pan means to move the display area slightly without changing the size of current view window. using the pan function ,you drag the drawing across the screen to display an area outside of the current view in the drawing editor.

REMARK

In all examples must change the
Limit , Units , grid, snap
to appropriate measurement scale
then click ***View ⇔ Zoom ⇔ all***
to apply changes to the drawing board.

Basic objects in AutoCAD

Line

Draw Line simple lines or series of lines segments .access to command line by one way of the following:

1. **Command Line: Line or L**
2. **Menu Bar :Draw ⇒Line**
3. **Draw Bar **

When execute command line the program requires specify first point, display in command line:

Specify first Point:

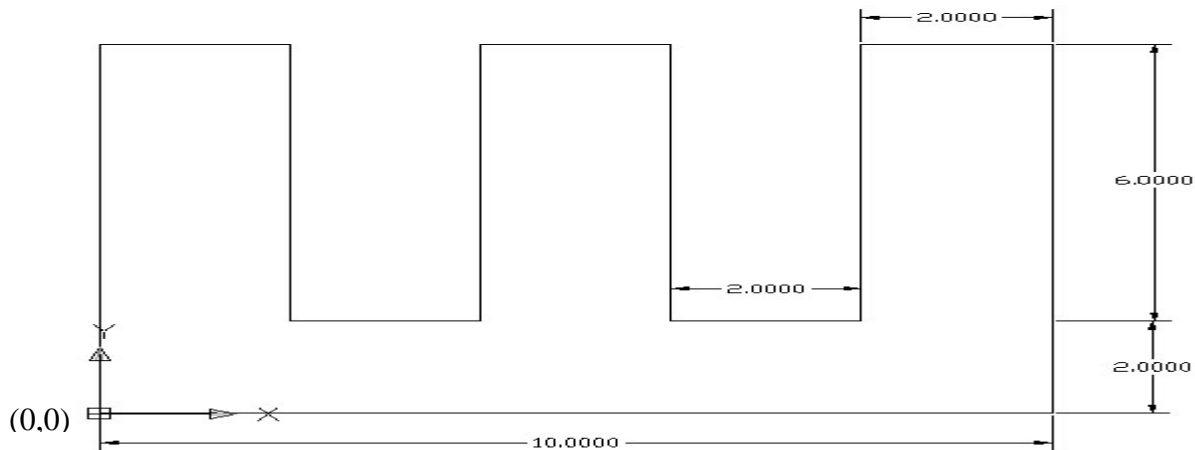
Specify next point or [Undo]:

Specify next point or[Close/Undo] :

Options:

- **C:** this option close series of lines, connect first point with last point by line.
- **U:** enter U for undo. AutoCAD backs up one segment, undoing it so that you can recreate it.

Example-1: Draw the following figure in board its' sides are (12×12 cm) ,from the original point (0,0).



Absolute coordinate system

Command: Line

Specify first point :0,0

Specify next Point :10,0

:10,8

:8,8

:8,2

:6,2

:6,8

:4,8

:4,2

:2,2

:2,8

:0,8

:0,0

Relative coordinate system

Command: Line

Specify first point :0,0

Specify next Point:@10,0

:@0,8

:@-2,0

:@0,-6

:@-2,0

:@0,6

:@-2,0

:@0,-6

:@-2,0

:@0,6

:@-2,0

:@0,-8or c

Relative Polar coordinate system

Command: Line

Specify first point :0,0

Specify next Point :@10<0

:@8<90

:@2<180

:@6<270

:@2<180

:@6<90

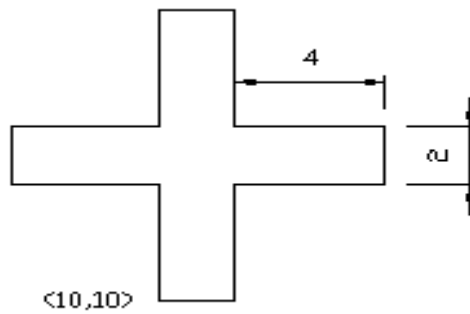
:@2<180

:@6<90

:@2<180

:@8<270 or c

Example-2: Draw the following figure in board its' sides are (25×25 m) ,if you know the figure is far away 10m Horizontally and 10m Vertically from original point.



Absolute coordinate system

Command: Line

Specify first point :10,10

Specify next Point :12,10

:12,14

:16,14

:16,16

:12,16

:12,20

:10,20

:10,16

: 6,16

:6,14

:10,14

:10,10or c

Relative coordinate system

Command: Line

Specify first point :10,10

Specify next Point:@2,0

:@0,4

:@4,0

:@0,2

:@-4,0

:@0,4

:@-2,0

:@0,-4

:@-4,0

:@0,-2

:@4,0

:@0,-4or c

Relative Polar coordinate system

Command: Line

Specify first point :10,10

Specify next Point :@2<0

:@4<90

:@4<0

:@2<90

:@4<180

:@4<90

:@2<180

:@4<270

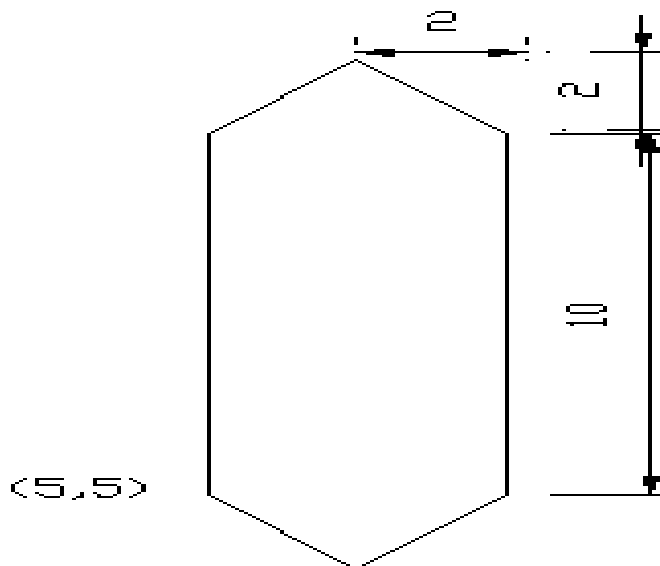
:@4<180

:@2<270

:@4<0

:@4<270

Example-3: Draw the following figure in board its sides (20×20 mm) ,if you know the figure is far away 5mm Horizontally and 5mm Vertically from original point.



Absolute coordinate system

Command: Line
 Specify first point :5,5
 Specify next Point :7,3
 :9,5
 :9,15
 :7,17
 :5,15
 :5,5 or c

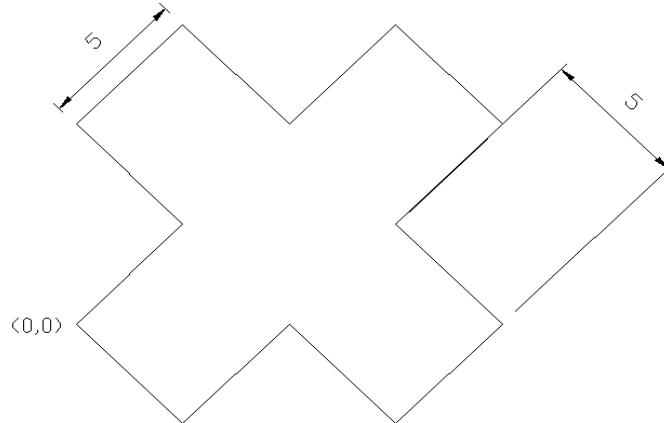
Relative coordinate system

Command: Line
 Specify first point :5,5
 Specify next Point:@2,-2
 :@2,2
 :@0,10
 :@-2,2
 :@-2,-2
 :@0,-10

Relative Polar coordinate system

Command: Line
 Specify first point :5,5
 Specify next Point :@2.828<315
 :@2.828<45
 :@10<90
 :@2.828<135
 :@2.828<225
 :@10<270 or c

Example-4: Draw the following figure in board its sides (10×10 m) ,if you know the figure is start from original point(0,0).

**Absolute coordinate system**

Command: Line
 Specify first point :0,0
 Specify next Point :3.5,-3.5
 :7,0
 :10.5,-3.5
 :14,0
 :10.5,3.5
 :14,7
 :10.5,10.5
 :7,7
 :3.5,10.5
 :0,7
 :3.5,3.5
 :0,0 or C

Relative coordinate system

Command: Line
 Specify first point :0,0
 Specify next Point:@3.5,-3.5
 :@3.5,3.5
 :@3.5,-3.5
 :@3.5,3.5
 :@-3.5,3.5
 :@3.5,3.5
 :@-3.5,3.5
 :@-3.5,-3.5
 :@-3.5,3.5
 :@-3.5,-3.5
 :@3.5,-3.5
 :@-3.5,-3.5 or C

Relative Polar coordinate system

Command: Line
 Specify first point :0,0
 Specify next Point :@5<315
 :@5<45
 :@5<315
 :@5<45
 :@5<135
 :@5<45
 :@5<135
 :@5<225
 :@5<135
 :@5<225
 :@5<315
 :@5<225

Rectangle

AutoCAD Provides the Rectangle command, which allows creating rectangles with perfect corners and as a single object. Access the command by:

1. **Command Line:** *Rectangle* , *Rec.*
2. **Menu Bar:** *Draw* ⇒ *Rectangle*.
3. **Draw Bar** | .

When enter command ,the program require specify first corner:

Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:

Specify other corner Point:

Options:

C: the chamfer command enables to place a chamfer at the rectangle corner. The distance specify is the distance from the intersection of the two lines (the corner) to the start of the bevel, or chamfer. you can set the chamfer distance for the two lines independently.

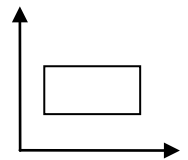


Specify first chamfer distance for rectangles<0.000>:

Specify second chamfer distance for rectangles<0.000>:

E: identify high of rectangle (this option use in 3D drawings).

Specify the elevation for rectangles<0.000>:



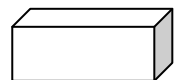
F: the fillet command creates both fillets and rounds on any combination of two lines, arcs, or circles.

Specify fillet radius for rectangles<0.000>:



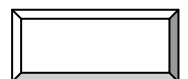
T: identify thick of rectangle(this option use in 3D drawings)

Specify thickness rectangles<0.000>:

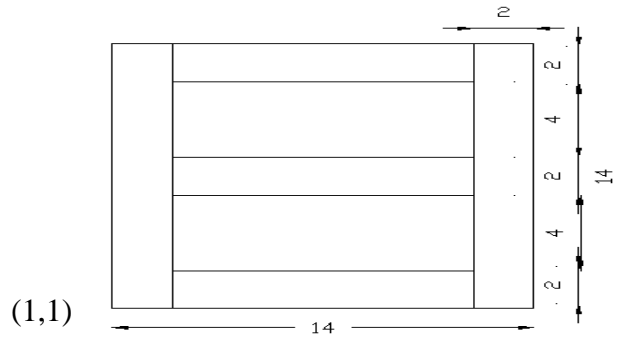


W: rectangle can have a width (the default width is 0).

Specify line width for rectangles<0.000>:



Example-1: Draw the Following figure, in board its' sides are (20×20 m) ,if you know the figure is far away 1m Horizontally and 1m Vertically from original point.



Absolute coordinate system

Command: Rec
 Specify first corner point:1,1
 Specify other corner Point;3,15
 Command: Rec
 Specify first corner point:3,1
 Specify other corner Point;13,3
 Command: Rec
 Specify first corner point:3,7
 Specify other corner Point;13,9
 Command: Rec
 Specify first corner point:3,13
 Specify other corner Point;13,15
 Command: Rec
 Specify first corner point:13,1
 Specify other corner Point;15,15

Relative Polar coordinate system

Command :Rec
 Specify first corner point:1,1
 Specify other corner Point;@14.14<81.86

 Command: Rec
 Specify first corner point:3,1
 Specify other corner Point;@10.19<11.30

 Command :Rec
 Specify first corner point:3,7
 Specify other corner Point;@10.19<11.30

 Command: Rec
 Specify first corner point:3,13
 Specify other corner Point;@10.19<11.30

 Command :Rec
 Specify first corner point:13,1
 Specify other corner Point;@14.14<81.86

Relative coordinate system

Command :Rec
 Specify first corner point:1,1
 Specify other corner Point;@2,14

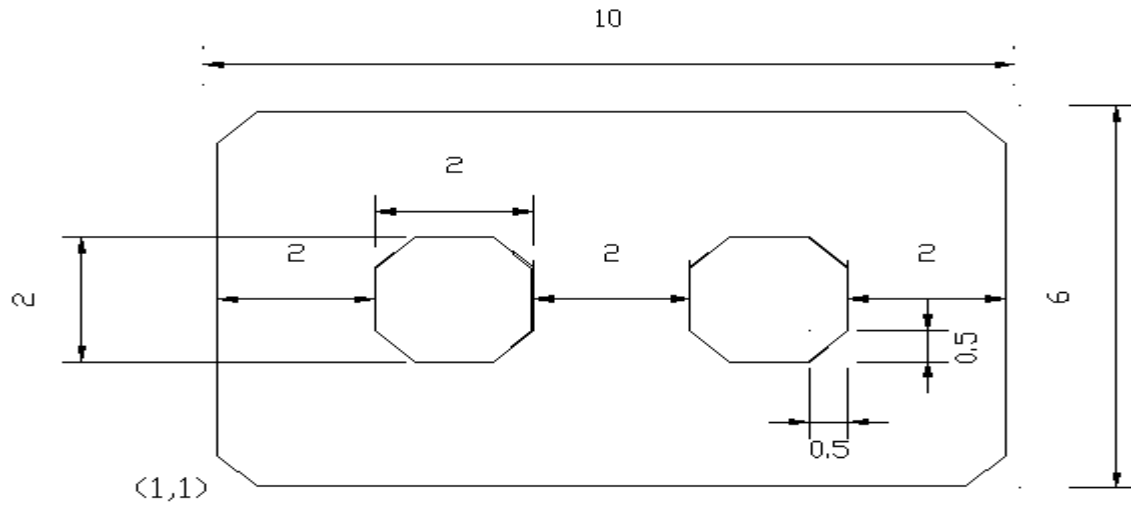
 Command :Rec
 Specify first corner point:3,1
 Specify other corner Point;@10,2

 Command: Rec
 Specify first corner point:3,7
 Specify other corner Point;@10,2

 Command: Rec
 Specify first corner point:3,13
 Specify other corner Point;@10,2

 Command: Rec
 Specify first corner point:13,1
 Specify other corner Point;@2,14

Example-2: Draw the Following figure



Absolute coordinate system

Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:1,1
 Specify other corner Point:11,7
Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:3,3
 Specify other corner Point:5,5
Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:7,3
 Specify other corner Point:9,5

Relative coordinate system

Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:1,1
 Specify other corner Point:@10,6
Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:3,3
 Specify other corner Point:@2,2
Command: Rec
 Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C
 Specify first chamfer distance for rectangles:0.5
 Specify second chamfer distance for rectangles:0.5
 Specify first corner point:7,3
 Specify other corner Point:@2,2

Relative Polar coordinate system

Command: Rec

Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C

Specify first chamfer distance for rectangles:0.5

Specify second chamfer distance for rectangles:0.5

Specify first corner point:1,1

Specify other corner Point:@11.66<30.96

Command: Rec

Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C

Specify first chamfer distance for rectangles:0.5

Specify second chamfer distance for rectangles:0.5

Specify first corner point:3,3

Specify other corner Point:@2.82<45

Command: Rec

Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:C

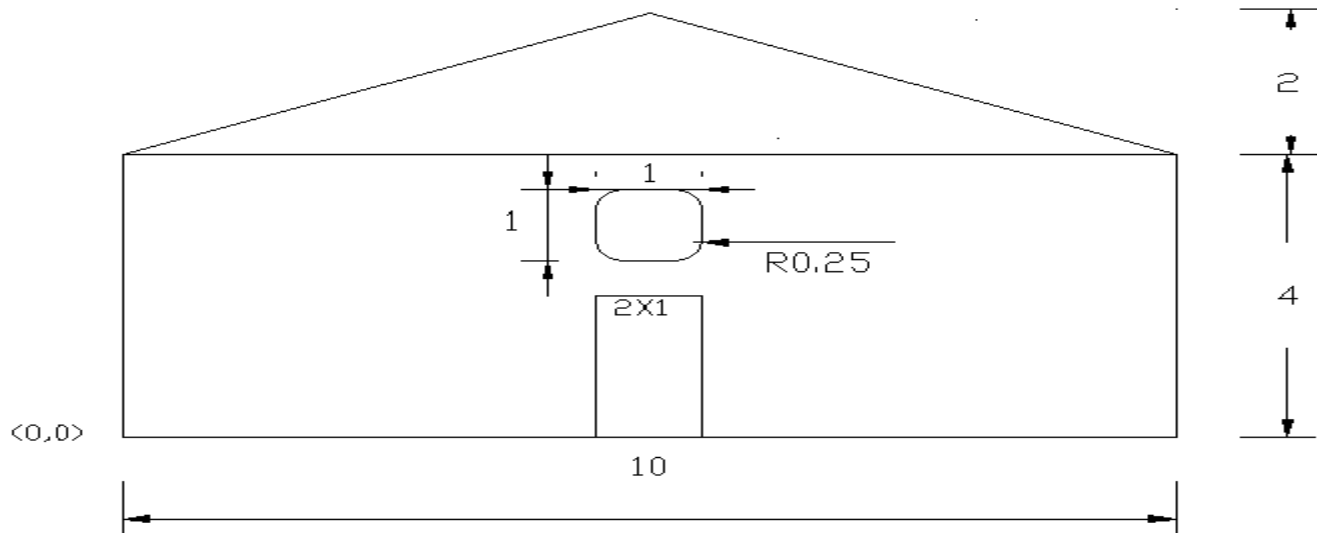
Specify first chamfer distance for rectangles:0.5

Specify second chamfer distance for rectangles:0.5

Specify first corner point:7,3

Specify other corner Point:@2.82<45

Example-3: Draw the Following figure to board its sides (12x12m).



Absolute coordinate system

Command: Rec

Specify first corner point:0,0

Specify other corner Point:10,4

Command: Rec

Specify first corner point:4.5,0

Specify other corner Point:5.5,2

Command: Rec

Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F

Specify fillet radius for rectangles:0.25

Specify first corner point:4.5,2.5

Specify other corner Point:5.5,3.5

Command: L

Specify first point:10,4

Specify next Point:5,6

Specify next Point:0,4

Relative coordinate system

Command: Rec
Specify first corner point:0,0
Specify other corner Point:@10,4
Command: Rec
Specify first corner point:4.5,0
Specify other corner Point:@1,2
Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.25
Specify first corner point:4.5,2.5
Specify other corner Point:@1,1
Command: L
Specify first point:10,4
Specify next Point:@-5,2
Specify next Point:@-5,-2

Relative Polar coordinate system

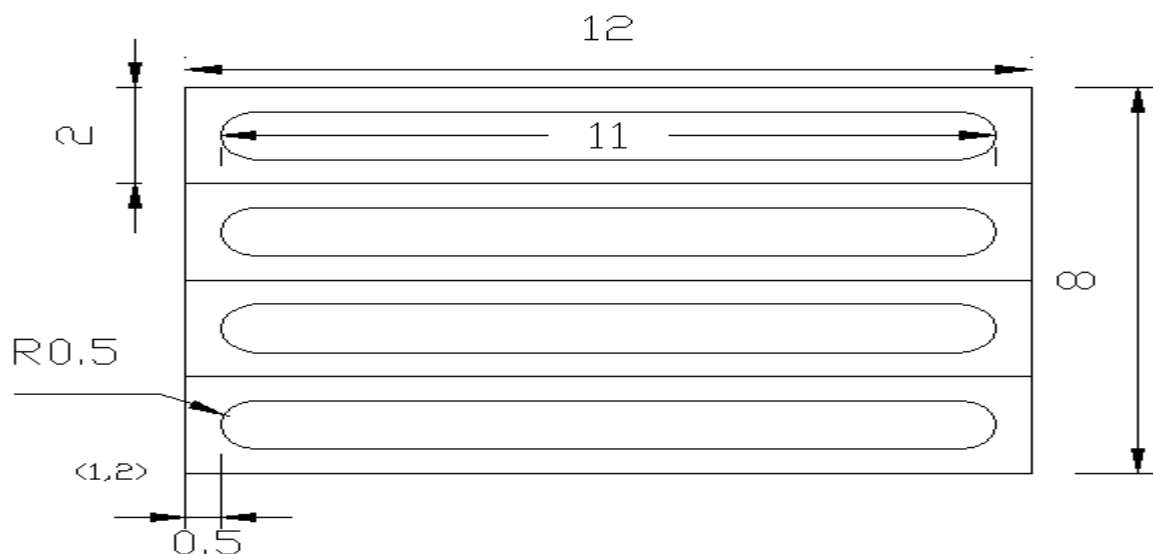
Command: Rec
Specify first corner point:0,0
Specify other corner Point:@10.77<21.80

Command: Rec
Specify first corner point:4.5,0
Specify other corner Point:@2.23<63.43

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.25
Specify first corner point:4.5,2.5
Specify other corner Point:@1.41<45

Command: L
Specify first point:10,4
Specify next Point:@5.38<158.1
Specify next Point:@5.38<201.80

Example-4: Draw the Following figure to board its sides' are (14x12mm). if you know the figure is far away 1mm Horizontally and 2mm Vertically from original point(0,0).



Absolute coordinate system

Command: Rec
Specify first corner point:1,2
Specify other corner Point:13,4

Command: Rec
Specify first corner point:1,4
Specify other corner Point:13,6

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,2.5
Specify other corner Point:12.5,3.5

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,4.5
Specify other corner Point:12.5,5.5

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,6.5
Specify other corner Point:12.5,7.5

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,8.5
Specify other corner Point:12.5,9.5

Relative coordinate system

Command: Rec
Specify first corner point:1,2
Specify other corner Point:@12,2

Command: Rec
Specify first corner point:1,4
Specify other corner Point:@12,2

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,2.5
Specify other corner Point:@11,1

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,4.5
Specify other corner Point:@11,1

Command: Rec
Specify first corner point:1,6
Specify other corner Point:13,8

Command: Rec
Specify first corner point:1,8
Specify other corner Point:13,10

Command: Rec
Specify first corner point:1,6
Specify other corner Point:@12,2

Command: Rec
Specify first corner point:1,8
Specify other corner Point:@12,2

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,6.5
Specify other corner Point:@11,1

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,8.5
Specify other corner Point:@11,1

Relative Polar coordinate system

Command: Rec
Specify first corner point:1,2
Specify other corner Point:@12.16<9.46

Command: Rec
Specify first corner point:1,6
Specify other corner Point:@12.16<9.46

Command: Rec
Specify first corner point:1,4
Specify other corner Point:@12.16<9.46

Command: Rec
Specify first corner point:1,8
Specify other corner Point:@12.16<9.46

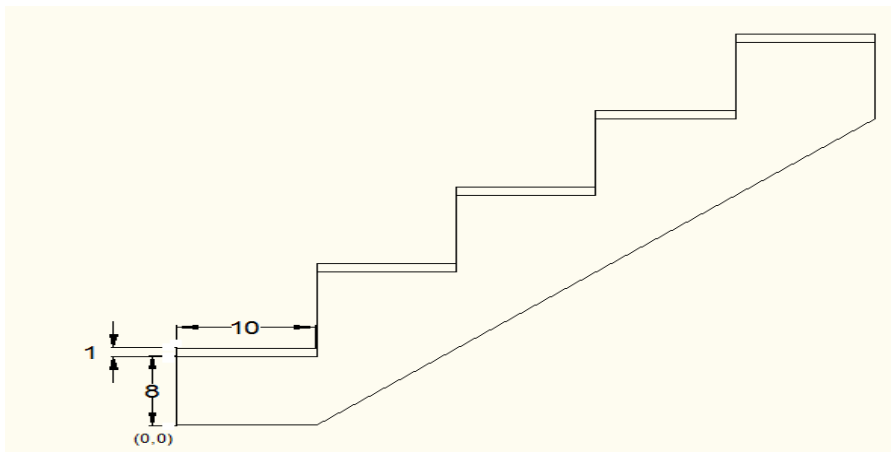
Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,2.5
Specify other corner Point:@11.04<5.19

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,4.5
Specify other corner Point:@11.04<5.19

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,6.5
Specify other corner Point:@11.04<5.19

Command: Rec
Specify first corner point or [Chamfer/ Elevation / Fillet / Thickness / Width]:F
Specify fillet radius for rectangles:0.5
Specify first corner point:1.5,8.5
Specify other corner Point:@11.04<5.19

Example-5: Draw the Stair step on board its' sides are (60,60 inches),the figure start from original point (0,0).



Absolute coordinate system

Command: Line
Specify first point:0,0
Specify next Point:0,8

Command: Line
Specify first point:10,9
Specify next Point:10,17

Command: Line
Specify first point:20,18
Specify next Point:20,26

Command: Line
Specify first point:30,27
Specify next Point:30,35

Command: Line
Specify first point:40,36
Specify next Point:40,45

Command: Line
Specify first point:0,0
Specify next Point:10,0
Specify next Point:50,35
Specify next Point:50,45

Command: Rectangle
Specify first corner point:0,8
Specify other corner Point:10,9

Command: Rectangle
Specify first corner point:10,17
Specify other corner Point:20,26

Command: Rectangle
Specify first corner point:20,18
Specify other corner Point:30,27

Command: Rectangle
Specify first corner point:30,35
Specify other corner Point:40,36

Command: Rectangle
Specify first corner point:40,44
Specify other corner Point:50,45

Relative coordinate system

Command: Line
Specify first point:0,0
Specify next Point:@0,8

Command: Line
Specify first point:10,9
Specify next Point:@0,8

Command: Line
Specify first point:20,18
Specify next Point:@0,8

Command: Line
Specify first point:30,27
Specify next Point:@0,8

Command: Line
Specify first point:40,36
Specify next Point:@0,8

Command: Line
Specify first point:0,0
Specify next Point:@10,0
Specify next Point:@40,36
Specify next Point:@0,8

Command: Rectangle
Specify first corner point:0,8
Specify other corner Point:@10,1

Command: Rectangle
Specify first corner point:10,17
Specify other corner Point:@10,1

Command: Rectangle
Specify first corner point:20,18
Specify other corner Point:@10,1

Command: Rectangle
Specify first corner point:30,35
Specify other corner Point:@10,1

Command: Rectangle
Specify first corner point:40,44
Specify other corner Point:@10,1

Relative Polar coordinate system

Command: Line
Specify first point:0,0
Specify next Point:@8<90

Command: Line
Specify first point:10,9
Specify next Point:@8<90

Command: Line
Specify first point:20,18
Specify next Point:@8<90

Command: Line
Specify first point:30,27
Specify next Point:@8<90

Command: Line
Specify first point:40,36
Specify next Point:@8<90

Command: Line
Specify first point:0,0
Specify next Point:@10<0
Specify next Point:@53.814<41.987
Specify next Point:@8<90

Command: Rectangle
Specify first corner point:0,8
Specify other corner Point:@10.049<5.710

Command: Rectangle
Specify first corner point:10,17
Specify other corner Point:@10.049<5.710

Command: Rectangle
Specify first corner point:20,18
Specify other corner Point:@10.049<5.710

Command: Rectangle
Specify first corner point:30,35
Specify other corner Point:@10.049<5.710

Command: Rectangle
Specify first corner point:40,44
Specify other corner Point:@10.049<5.710

Circle

Provide Circle many ways to draw circles. access the command from:

Command Line: Circle , C

1. **Menu Bar: Draw ⇒Circle**
2. **Draw Bar: **

Display following message:

Specify center point for circle or [3P/2P/Ttr(tan tan radius)]:

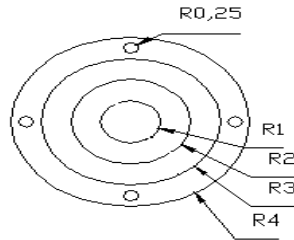
Specify radius of circle or [Diameter]:D

Specify diameter of circle<current default>:

Options:

- **3P(3 point):**the circle passes through all three points specified.
- **2P(2 point)** .the two points specify the location and diameter.
- **Ttr(tan tan radius)** .specify two objects for the circle to be tangent to, then specify the radius.
- **TTT (Draw ⇒Circle⇒Tan Tan Tan).**

Example-1: Draw the Following figure in board its' sides are (15x15cm).



Absolute coordinate system

Command : C
 Specify center point for circle:0,0
 Specify radius of circle:1

Command : C
 Specify center point for circle:0,0
 Specify radius of circle:2

Command : C
 Specify center point for circle:0,0
 Specify radius of circle:3

Command : C
 Specify center point for circle:0,0
 Specify radius of circle:4

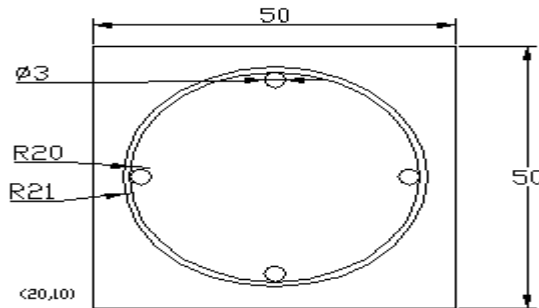
Command : C
 Specify center point for circle:0,3.5
 Specify radius of circle:0.25

Command : C
 Specify center point for circle:3.5,0
 Specify radius of circle:0.25

Command : C
 Specify center point for circle:-3.5,0
 Specify radius of circle:0.25

Command : C
 Specify center point for circle:0,-3.5
 Specify radius of circle:0.25

Example – 2: Draw the following figure in board its' sides are (100×100 mm), if you know the figure is far away 20mm horizontally and 10mm vertically from original point.



Absolute coordinate system

Command: Rec
 Specify first corner point:20,10
 Specify other corner Point:70,60

Command : C
 Specify center point for circle:45,35
 Specify radius of circle:20

Command : C
 Specify center point for circle:45,35
 Specify radius of circle:21

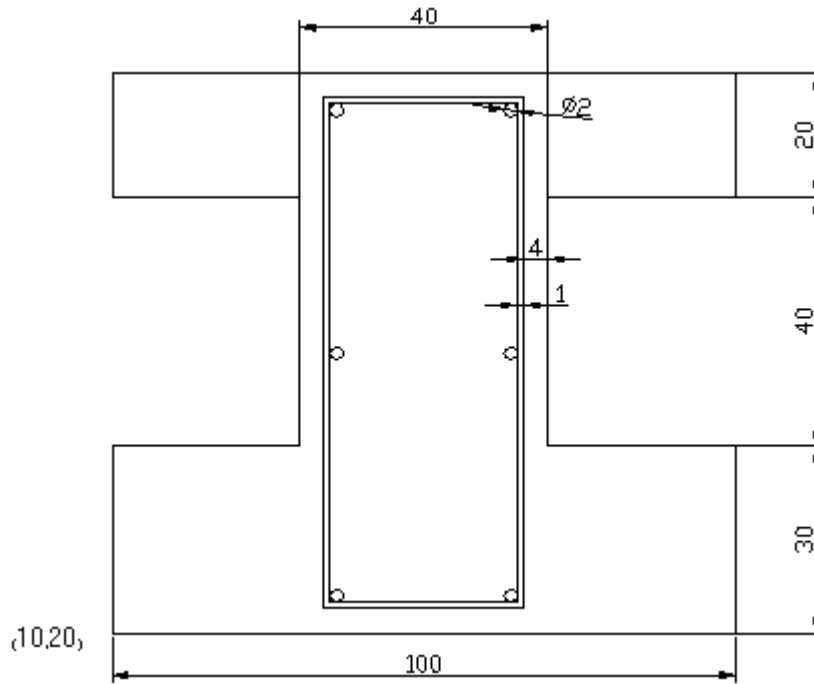
Command : C
 Specify center point for circle:45,53.5
 Specify radius of circle:1.5

Command : C
 Specify center point for circle:63.5,35
 Specify radius of circle:1.5

Command : C
 Specify center point for circle:26.5,35
 Specify radius of circle:1.5

Command : C
 Specify center point for circle:45,16.5
 Specify radius of circle:1.5

Example-3: Draw the following figure in board its' sides are (150×150 cm). if you know the figure is far away 10cm Horizontally and 20cm Vertically from original point(0,0).



Absolute coordinate system

Command: L

Specify first point:10,20

Specify next Point:110,20

:110,50

:80,50

:80,90

:110,90

:110,110

:10,110

:10,90

:40,90

:40,50

:10,50

:10,20

Command: Rec

Specify first corner point:44,24

Specify other corner Point:76,106

Command: Rec

Specify first corner point:45,25

Specify other corner Point:75,105

Command : C

Specify center point for circle:46,26

Specify radius of circle:1

Command : C

Specify center point for circle:74,26

Specify radius of circle:1

Command : C

Specify center point for circle:46,70

Specify radius of circle:1

Command : C

Specify center point for circle:74,70

Specify radius of circle:1

Command : C

Specify center point for circle:46,104

Specify radius of circle:1

Command : C

Specify center point for circle:74,104

Specify radius of circle:1

Relative coordinate system

Command: L

Specify first point:10,20

Specify next Point:@100,0

:@0,30

:@-30,0

:@0,40

:@30,0

:@0,20

:@-100,0

:@0,-20

:@30,0

:@0,-40

:@-30,0

:@0,-30

Command: Rec

Specify first corner point:44,24

Specify other corner Point:@32,82

Command: Rec

Specify first corner point:45,25

Specify other corner Point:@30,80

Relative Polar coordinate system

Command: L

Specify first point:10,20

Specify next Point:@100<0

:@30<90

:@30<180

:@40<90

:@30<0

:@20<90

:@100<180

:@20<270

:@30<0

:@40<270

:@30<180

:@30<270

Command: Rec

Specify first corner point:44,24

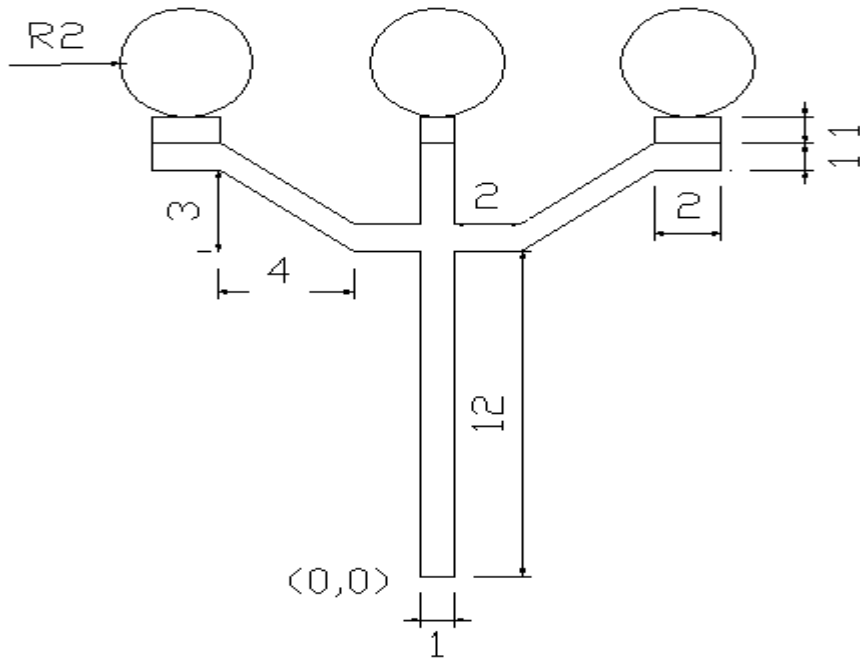
Specify other corner Point:@88.02<68.68

Command: Rec

Specify first corner point:45,25

Specify other corner Point:@85.44<69.44

Example-4: Draw the following figure in board its' are sides (20×20 cm). if you know the figure is start from original point(0,0).



Absolute coordinate system

Command: L

Specify first point:0,0

Specify next Point:1,0

:1,12

:3,12

:7,15

:9,15

:9,16

:7,16

:3,13

:1,13

:1,16

:0,16

:0,13

:-2,13

:-6,16

:-8,16

:-8,15

:-6,15

:-2,12

:0,12

:0,0

Command: Rec

Specify first corner point:7,16

Specify other corner Point:9,17

Command: Rec

Specify first corner point:0,16

Specify other corner Point:1,17

Command: Rec

Specify first corner point:-8,16

Specify other corner Point:-6,17

Command : C

Specify center point for circle:8,9

Specify radius of circle:2

Command : C

Specify center point for circle:0.5,9

Specify radius of circle:2

Command : C

Specify center point for circle:-7,9

Specify radius of circle:2

Relative coordinate system

Command: L

Specify first point:0,0
Specify next Point:@1,0
:@0,12
:@2,0
:@4,3
:@2,0
:@0,1
:@-2,0
:@-4,-3
:@-2,0
:@0,3
:@-1,0
:@0,-3
:@-2,0
:@-4,3
:@-2,0
:@0,-1
:@2,0
:@4,-3
:@2,0
:@0,-12

Command: Rec
Specify first corner point:7,16
Specify other corner Point:@2,1

Command: Rec
Specify first corner point:0,16
Specify other corner Point:@1,1

Command: Rec
Specify first corner point:-8,16
Specify other corner Point:@2,1

Command : C
Specify center point for circle:8,9
Specify radius of circle:2

Command : C
Specify center point for circle:0.5,9
Specify radius of circle:2

Command : C
Specify center point for circle:-7,9
Specify radius of circle:2

Relative Polar coordinate system

Command: L
Specify first point:0,0
Specify next Point:@1<0
:@12<90
:@2<0
:@5<36.86
:@2<0
:@1<90
:@2<180
:@5<216.86
:@2<180
:@3<90
:@1<180
:@3<270
:@2<180
:@5<143.14
:@2<180
:@1<270
:@2<0
:@5<323.14
:@2<0
:@12<270

Command: Rec
Specify first corner point:7,16
Specify other corner Point:@2.23<26.56

Command: Rec
Specify first corner point:0,16
Specify other corner Point:@1.41<45

Command: Rec
Specify first corner point:-8,16
Specify other corner Point:@2.23<26.56

Command : C
Specify center point for circle:8,9
Specify radius of circle:2

Command : C
Specify center point for circle:0.5,9
Specify radius of circle:2

Command : C
Specify center point for circle:-7,9
Specify radius of circle:2

ARC

In AutoCAD, the Arc command is often used to produce arcs.

1. **Command Line:** Arc or a
2. **Menu Bar:** Draw ⇒ Arc
3. **Draw Bar:** 

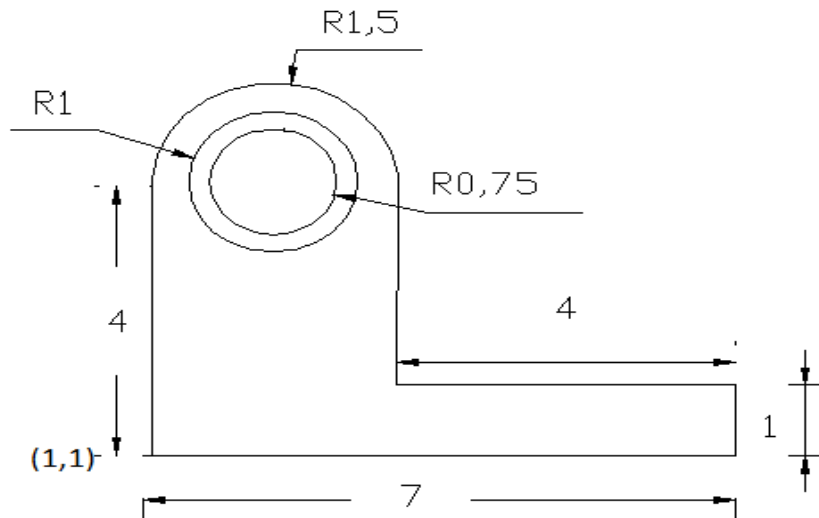
The following message appear:

- Specify start point of arc or [Center]:**
- Specify second point of arc or [Center/ End]:**
- Specify end point of arc or [Angle / chord length] :**
- Specify center point of arc or [Angle/ Direction / Radius]:**

Options:

- Angle.** Draw arc using angle.
- Chord Length.** Draw arc using chord length.

Example-1: Draw the following figure in board its' sides are (10×10 m).



○Absolute coordinate system

Command: L
Specify first point:1,1
Specify next Point:8,1
:8,2
:4,2
:4,5

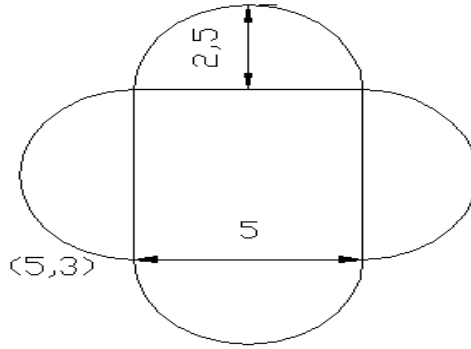
Command: L
Specify first point:1,1
Specify next Point:1,5

Command: a
Specify 1st point of arc:4,5
Specify center point of arc:2.5,6.5
Specify end point: 1,5

Command : C
Specify center point for circle:2.5,5
Specify radius of circle:0.750

Command : C
Specify center point for circle:2.5,5
Specify radius of circle:1

Example-2: Draw the following figure in board its' are sides (12×12 cm). if you know the figure is far away 5cm Horizontally and 3cm Vertically from original point(0,0).



Absolute coordinate system

Command: Rec

Specify first corner point:5,3

Specify next corner Point:10,8

Drawing arc using 3Points

Specify 1st point of arc:5,8

Specify 2nd point of arc :2.5,5.5

Specify end point: 5,3

Command: a

Specify 1st point of arc:10,8

Specify 2nd point of arc:7.5,10.5

Specify end point: 5,8

Command: a

Specify 1st point of arc :10,3

Specify 2nd point of arc:12.5,5.5

Specify end point: 10,8

Command: a

Specify 1st point of arc:5,3

Specify 2nd point of arc:7.5,0.5

Specify end point: 10,3

Drawing arc using Start/ Center /End

Command: a

Specify 1st point of arc:5,8

Specify center point of arc:5,5.5

Specify end point: 5,3

Command: a

Specify 1st point of arc:10,8

Specify center point of arc:7.5,8

Specify end point: 5,8

Command: a

Specify 1st point of arc:10,3

Specify center point of arc:10,5.5

Specify end point: 10,8

Command: a

Specify 1st point of arc:5,3

Specify center point of arc:7.5,3

Specify end point: 10,3

Drawing arc using Start/ Center /Angle

Command: a

Specify 1st point of arc:5,8

Specify center point of arc:5,5.5

Specify included angle: 180

Command: a

Specify 1st point of arc:10,8

Specify center point of arc:7.5,8

Specify included angle: 180

Command: a

Specify 1st point of arc:10,3

Specify center point of arc:10,5.5

Specify included angle: 180

Command: a

Specify 1st point of arc:5,3

Specify center point of arc:7.5,3

Specify included angle:180

Drawing arc using Start/ Center /Length

Command: a

Specify 1st point of arc:5,8

Specify center point of arc:5,5.5

Specify length of chord:5

Command: a

Specify 1st point of arc:10,8

Specify center point of arc:7.5,8

Specify length of chord:5

Command: a

Specify 1st point of arc:10,3

Specify center point of arc:10,5.5

Specify length of chord: 5

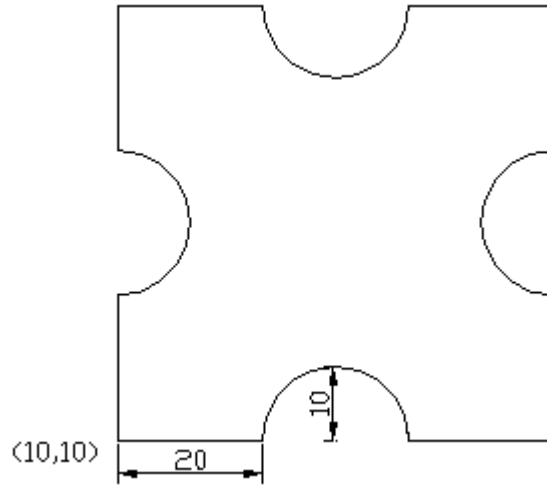
Command: a

Specify 1st point of arc:5,3

Specify center point of arc:7.5,3

Specify length of chord: 5

Example-3: Draw the following figure in board its sides (100×100 inch). if you know the figure is far away 10inch Horizontally and 10 inch Vertically from original point(0,0).



Absolute coordinate system

Command: L
Specify first point:10,10
Specify next Point:30,10
Key Board : Esc

Command: L
Specify first point:50,10
Specify next Point:70,10
Key Board : Esc

Command: L
Specify first point:70,10
Specify next Point:70,30
Key Board : Esc

Command: L
Specify first point:70,50
Specify next Point:70,70
Key Board : Esc

Command: L
Specify first point:70,70
Specify next Point:50,70
Key Board : Esc

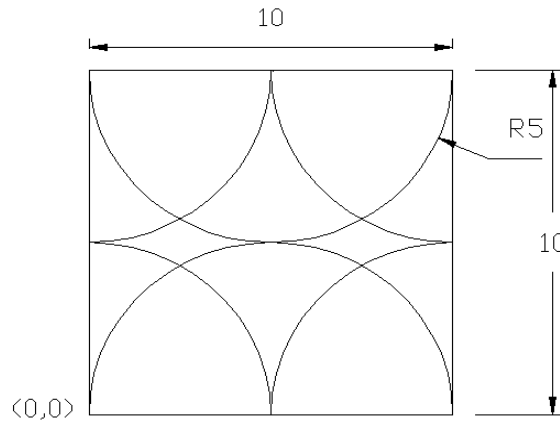
Command: L
Specify first point:30,70
Specify next Point:10,70
Key Board : Esc

Command: L
Specify first point:10,70
Specify next Point:10,50
Key Board : Esc

Command: L
Specify first point:10,30
Specify next Point:10,10
Key Board : Esc

Drawing arc using 3Points*Command: a**Specify 1st point of arc:10,30**Specify 2nd point of arc:20,40**Specify end point: 10,50**Command: a**Specify 1st point:50,70**Specify 2nd point:40,60**Specify end point: 30,70**Command: a**Specify 1st point:70,30**Specify 2nd point:60,40**Specify endpoint 70,50**Command: a**Specify 1st point: 30,10**Specify 2nd point: 40,20**Specify endpoint:50,10***Drawing arc using Start/ Center /End***Command: a**Specify 1st point of arc:10,30**Specify center point of arc:10,40**Specify end point: 10,50**Command: a**Specify 1st point of arc:30,70**Specify center point of arc:40,70**Specify end point: 50,70**Command: a**Specify 1st point of arc:70,50**Specify center point of arc:70,40**Specify end point: 70,30**Command: a**Specify 1st point :50,10**Specify center point of arc:40,10**Specify end point: 30,10***Drawing arc using Start/ Center /Angle***Command: a**Specify 1st point:10,30**Specify center point:10,40**Specify included angle:180**Command: a**Specify 1st point :30,70**Specify center point:40,70**Specify included angle:180**Command: a**Specify 1st point:70,50**Specify center point:70,40**Specify included angle:180**Command: a**Specify 1st point:50,10**Specify center point:40,10**Specify included angle:180***Drawing arc using Start/ Center /Length***Command: a**Specify 1st point:10,30**Specify center point:10,40**Specify length of chord:20**Command: a**Specify 1st point:30,70**Specify center point:40,70**Specify length of chord:20**Command: a**Specify 1st point:70,50**Specify center point:70,40**Specify length of chord: 20**Command: a**Specify 1st point:50,10**Specify center point:40,10**Specify length of chord: 20*

Example-4: Draw the following figure in board its' sides are (12×12 inch). if you know the figure is start from original point(0,0).



Drawing arc using 3Points

Command: a

Specify 1st point: 0,0

Specify 2nd poin: 5,5

Specify endpoint:10,0

Command: a

Specify 1st poin:10,10

Specify 2nd point:5,5

Specify end point: 0,10

Command: a

Specify 1st poin:5,0

Specify 2nd point:6.5,3.5

Specify end point:10,5

Command: a

Specify 1st poin:10,5

Specify 2nd point:6.5,6.5

Specify end point: 5,10

Command: a

Specify 1st poin:5,10

Specify 2nd point:3.5,6.5

Specify end point: 0,5

Command: a

Specify 1st poin:0,5

Specify 2nd point:3.5,3.5

Specify end point: 5,0

Drawing arc using Start/ Center /Angle

Command: a

Specify 1st point:10,5

Specify center point:10, 0

Specify included angle:90

Command: a

Specify 1st point:5,10

Specify center point:10,10

Specify included angle:90

Command: a

Specify 1st point: 0,5

Specify center point: 0,10

Specify included angle:90

Command: a

Specify 1st point:5, 0

Specify center point: 0,0

Specify included angle:90

Command: a

Specify 1st point:10, 0

Specify center point: 5,0

Specify included angle:180

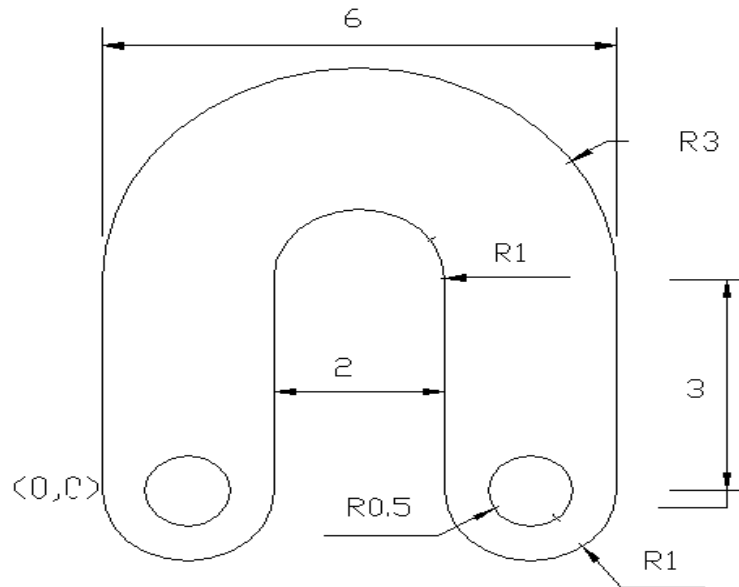
Command: a

Specify 1st point:0,10

Specify center point: 5,10

Specify included angle:180

Example-5: Draw the following figure in board its' sides are (10×10 mm). if you know the figure is start from original point(0,0).



Absolute coordinate system

Command: L
Specify first point:0,0
Specify next Point:0,3

Command: L
Specify first point:2,0
Specify next Point:2,3

Command: L
Specify first point:4,0
Specify next Point:4,3

Command: L
Specify first point:6,0
Specify next Point:6,3

Command: a
Specify 1st point: 0,0
Specify 2nd poin: 1,-1
Specify endpoint:2,0

Command: a
Specify 1st point: 4,0
Specify 2nd poin: 5,-1
Specify endpoint:6,0

Command: a
Specify 1st point: 2,3
Specify 2nd poin: 3,4
Specify endpoint:4,3

Command: a
Specify 1st point: 0,3
Specify 2nd poin: 3,6
Specify endpoint:6,3

Command : C
Specify center point for circle:1,0
Specify radius of circle:0.5

Command : C
Specify center point for circle:5,0
Specify radius of circle:0.5

Ellipse :

An ellipse is one object. AutoCAD ellipses are NURBS curves.

1. **Command Line:** El
2. **Menu Bar:** Draw ⇒ Ellipse
3. **Draw Bar:** 

In AutoCAD three ways to draw ellipse:

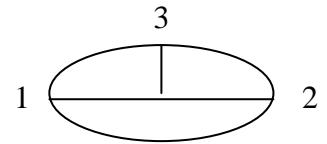
1. Axis end (Specify one axis and the end of second)

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]:

Specify other end point of axis:

Specify distance to other axis or [Rotation]:



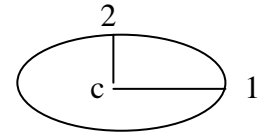
2. Center (Specify the center and the end of each axis)

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellipse:

Specify end point of axis:

Specify distance to other axis or [rotation]:



3. Arc (create an ellipse arc)

Specify axis end point of ellipse or [Arc / Center]:A

Specify axis endpoint of elliptical arc or [center]:

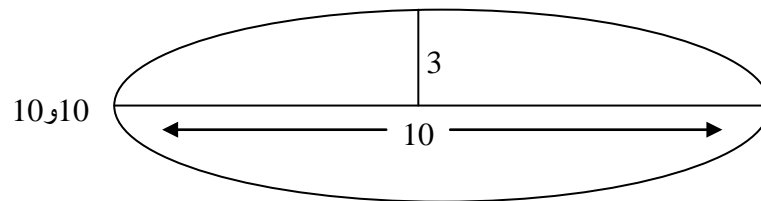
Specify other endpoint of axis:

Specify distance to other axis or [rotation]:

Specify start angle or [parameter]:

Specify end angle or [parameter / included angle]:

Example-1: Draw the following figure in board its' sides are (20×20 mm).



Axis end

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 10,10

Specify other end point of axis: 20,10

Specify distance to other axis or [Rotation]:3

Center

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:15,10

Specify end point of axis:20,10

Specify distance to other axis or [rotation]:15,13

Arc

Specify axis end point of ellipse or [Arc / Center]:A

Specify axis endpoint of elliptical arc or [center]:20,10

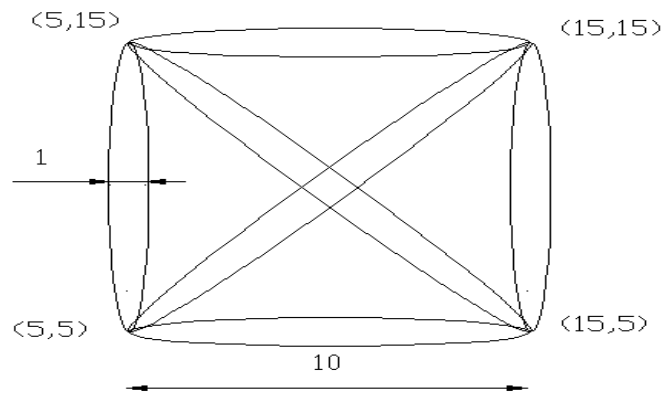
Specify other endpoint of axis:10,10

Specify distance to other axis or [rotation]:r

Specify start angle or [parameter]:0

Specify end angle or [parameter / included angle]:45

Example-2: Draw the following figure in board its sides (20×20 inch). if you know the figure is far away 5inch Horizontally and 5inch Vertically from original point(0,0).



Axis end

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 5,5

Specify other end point of axis: 15,5

Specify distance to other axis or [Rotation]:0.5

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 15,5

Specify other end point of axis: 15,15

Specify distance to other axis or [Rotation]:0.5

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 15,15

Specify other end point of axis: 1,15

Specify distance to other axis or [Rotation]:0.5

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 5,15

Specify other end point of axis: 5,5

Specify distance to other axis or [Rotation]:0.5

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 5,5

Specify other end point of axis: 15,15

Specify distance to other axis or [Rotation]:0.5

Command : ellipse

Specify axis end point of ellipse or [Arc / Center]: 15,5

Specify other end point of axis: 5,15

Specify distance to other axis or [Rotation]:0.5

Center

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:10,5

Specify end point of axis:15,5

Specify distance to other axis or [rotation]:0.5

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:15,10

Specify end point of axis:15,5

Specify distance to other axis or [rotation]:0.5

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:10,15

Specify end point of axis:15,15

Specify distance to other axis or [rotation]:0.5

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:5,10

Specify end point of axis:5,15

Specify distance to other axis or [rotation]:0.5

Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:10,10

Specify end point of axis:15,15

Specify distance to other axis or [rotation]:0.5

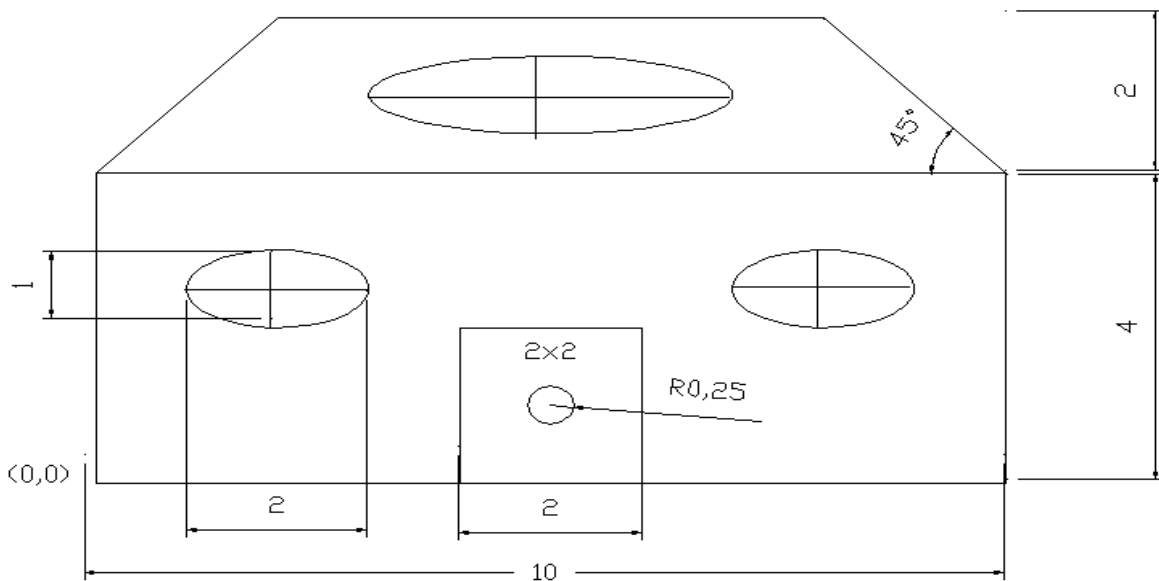
Specify axis end point of ellipse or [Arc / Center]:C

Specify center of ellips:10,10

Specify end point of axis:15,5

Specify distance to other axis or [rotation]:0.5

Example-3: Draw the following figure in board its sides (20×20 m).



Axis end

(Draw Walls)

Command: rectangle
Specify first corner point:0,0
Specify other corner point: 10,4

Command:Line (enter)
Specify first point :10,4
Specify next Point :8,6
Specify next Point :2,6
Specify next Point :0,4

(Draw door)

Command: rectangle
Specify first corner point:5,0
Specify other corner point: 6,2

Command : C
Specify center point for circle:5,1
Specify radius of circle:0.25

(Draw left window)

Command : ellipse
Specify axis end point of ellipse or [Arc / Center]: 1,2.5
Specify other end point of axis: 3,2.5
Specify distance to other axis or [Rotation]:0.5

Command:Line (enter)
Specify first point :1,2.5
Specify next Point :3,2.5

Command:Line (enter)
Specify first point :2,2
Specify next Point :2,3

(draw right window)

Command : ellipse
Specify axis end point of ellipse or [Arc / Center]: 7,2.5
Specify other end point of axis: 9,2.5
Specify distance to other axis or [Rotation]:0.5

Command:Line (enter)
Specify first point :7,2.5
Specify next Point :9,2.5

Command:Line (enter)
Specify first point :8,2
Specify next Point :8,3

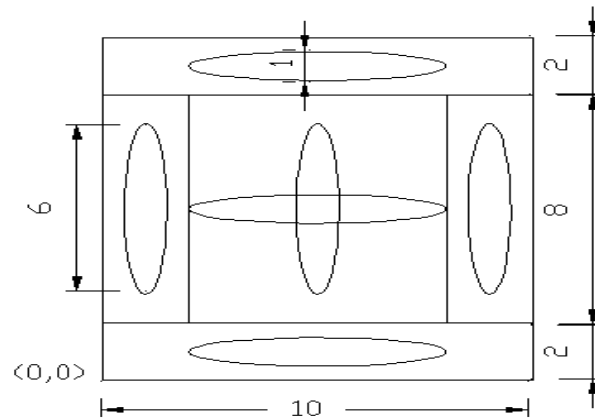
(draw center window)

Command : ellipse
Specify axis end point of ellipse or [Arc / Center]: 7,5
Specify other end point of axis: 3,5
Specify distance to other axis or [Rotation]:0.5

Command:Line (enter)
Specify first point :3,5
Specify next Point :7,5

Command:Line (enter)
Specify first point :5,4.5
Specify next Point :5,5.5

Example-4: Draw the following figure in board its' sides are (20×20 mm). if you know the figure is start from original point(0,0).



Axis end

Command: rectangle
 Specify first corner point:0,0
 Specify other corner point: 10,20

Command: rectangle
 Specify first corner point:0,2
 Specify other corner point: 2,10

Command: rectangle
 Specify first corner point:8,2
 Specify other corner point: 10,10

Command: rectangle
 Specify first corner point:0,10
 Specify other corner point:10,12

Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 2,1
 Specify other end point of axis: 8,1
 Specify distance to other axis or [Rotation]:0.5

Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 2,11
 Specify other end point of axis: 8,11
 Specify distance to other axis or [Rotation]:0.5

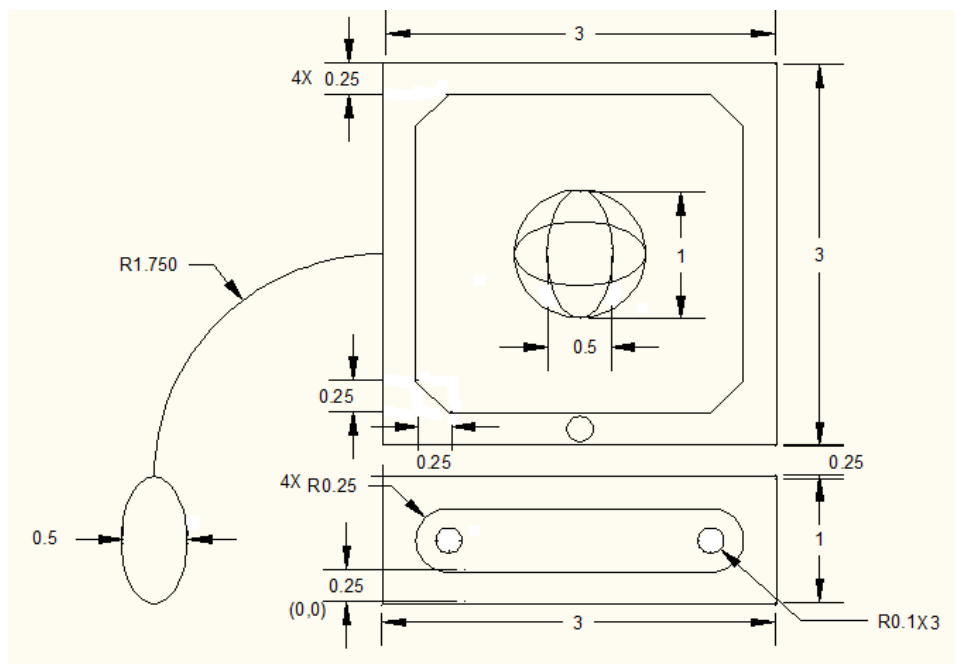
Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 2,6
 Specify other end point of axis: 8,6
 Specify distance to other axis or [Rotation]:0.5

Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 1,3
 Specify other end point of axis: 1,9
 Specify distance to other axis or [Rotation]:0.5

Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 9,3
 Specify other end point of axis: 9,9
 Specify distance to other axis or [Rotation]:0.5

Command : ellipse
 Specify axis end point of ellipse or [Arc / Center]: 5,3
 Specify other end point of axis: 5,9
 Specify distance to other axis or [Rotation]:0.5

Example-5: Draw the Computer on board its' sides are (6,6 ft),the figure start from original point(0,0).



Axis end

Command: rectangle

Specify first corner point:0,0

Specify other corner point: 3,1

Command: Rectangle

Specify first corner point or []:F

Specify fillet radius for rectangles:0.25

Specify first corner point:0.25,0.25

Specify other corner Point:2.750,0.750

Command: rectangle

Specify first corner point:0,1.25

Specify other corner point: 3,4.25

Command: Rec

Specify first corner point or [h]:C

Specify first chamfer distance for rectangles:0.25

Specify second chamfer distance for rectangles:0.25

Specify first corner point:0.25,1.5

Specify other corner Point:2.750,4

Command : ellipse

Specify axis end point of ellipse or []: 1.5,2.25

Specify other end point of axis: 1.5,3.5

Specify distance to other axis or [Rotation]:0.25

Command : ellipse
Specify axis end point of ellipse or []: 1,2.750
Specify other end point of axis: 2,2.750
Specify distance to other axis or [Rotation]:0.25

Command : ellipse
Specify axis end point of ellipse or []: -1.750,0
Specify other end point of axis: -1.750,1
Specify distance to other axis or [Rotation]:0.25

Command: arc
Specify first point:0,2.750
Specify center point:0,1
Specify included angle:90

Command : C
Specify center point for circle:1.5,2.750
Specify radius of circle:1


Command : C
Specify center point for circle:1.5,1.350
Specify radius of circle:0.1

Command : C
Specify center point for circle:0.6,0.6
Specify radius of circle:0.1

Command : C
Specify center point for circle:2.4,0.6
Specify radius of circle:0.1

Polygon

The Polygon command enables to create regular polygon with 3 to 1024 sides. a regular polygon is one with sides of equal length.

1. **Command Line: Pol**
2. **Menu Bar : Draw ⇒ Polygon**
3. **Draw Bar :** 

When Enter polygon command, the following message appear:

Enter number of sides<>:

Specify center point or [edge]:

If our chose the Edge option ,the program require the following:

Specify first endpoint of edge:

Specify second endpoint of edge:

If our option specifies Center point, the program requires the radius of circle:

Enter an option [Inscribed in circle / Circumference about circle] < >:

Options:

I.Inscribed option allows control of one half of the distance across the corner.

C.Circumscribed option allows control of one half of the distance across the flats.

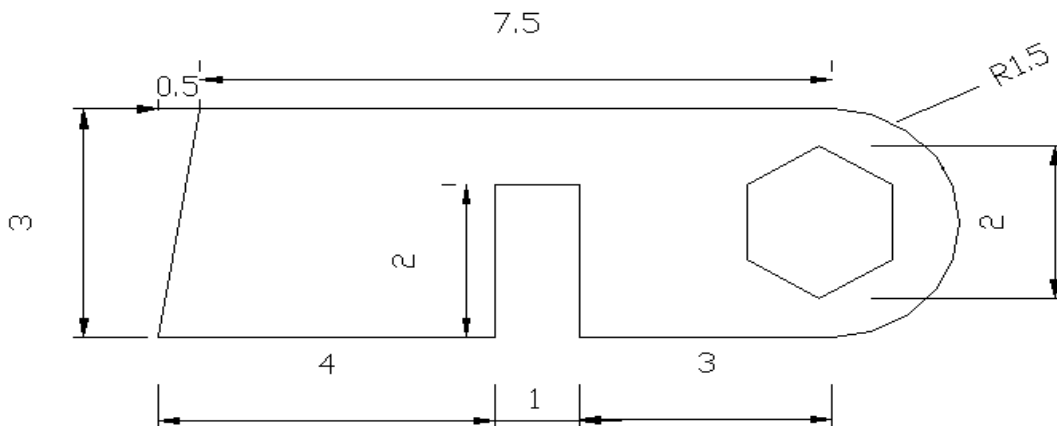
When determine one of the options the program display the message:

Specify radius of circle:



(Remark: the circle is not display in the drawing).

Example-1: Draw the following figure.



Command: line
Specify first point:0,0
Specify next point: 4,0
Specify next point: 4,2
Specify next point: 5,2
Specify next point: 5,0
Specify next point: 8,0
Esc from keyboard

Command: line
Specify first point:0,0
Specify next point: 0.5,3
Specify next point: 8,3

Command: a
Specify first point: 8,0
Specify center point: 8,1.5
Specify endpoint:8,3

Command: Pol
Enter number of sides:6
Specify center point or [edge]:8,1.5
Specify radius of circle:1

Donut

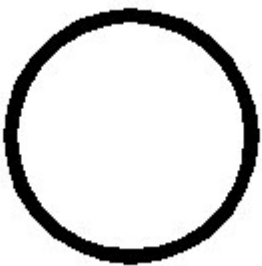
The donut command allows to create thick – walled or solid circles, known in AutoCAD as donuts. access the command by:

- 1. Command Line: do**
- 2. Menu Bar: Draw ⇒ Donut**

Specify inside diameter of donut:
Specify outside diameter of donut:
Specify center of donut or <exit>:

Press enter to exit the command.

Example: Draw the following figures:



Inside diameter =1.8
Outside diameter=2




Inside diameter =0.5
Outside diameter=1



Inside diameter =0
Outside diameter=1

Hatch

A hatch or crosshatch is a repetitive pattern of lines or symbols that shows a related area of a drawing. access command by:

1. **Command Line:** *Hatch* or *H*
2. **Menu Bar :** *Draw* ⇒ *Hatch*
3. **Draw Bar :** 

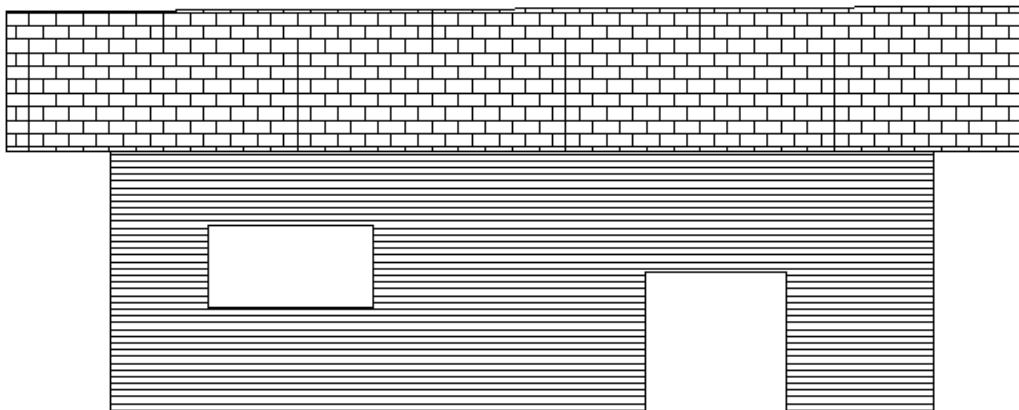
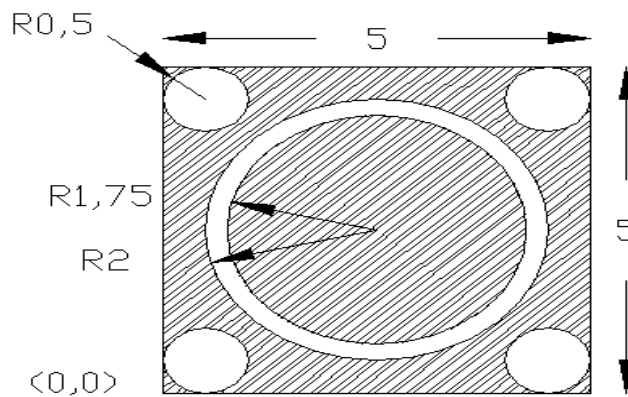
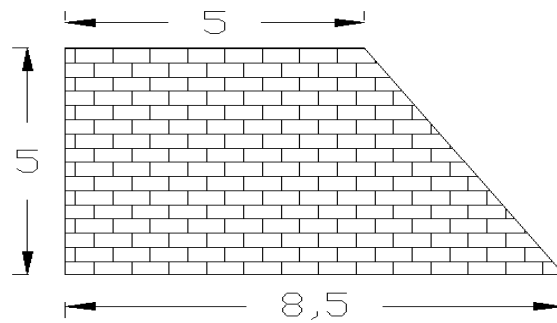
Specify pattern name or [?/Solid/User defined]<current pattern>:

Specify a scale for the pattern <current default>:

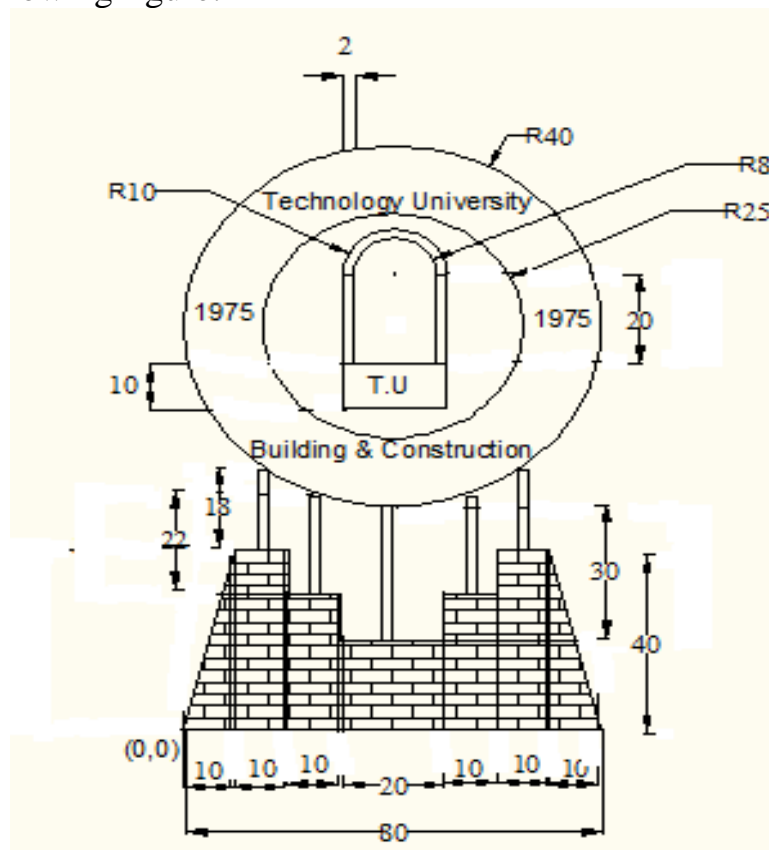
Select objects to define hatch boundary or <direct hatch>:

Select objects:

Example-1: add hatch to the following figures:




Example-2: draw the following figure:



Construction Line

Construction lines, also called xlines, are lines of infinite length, they can be used to construct objects and lay out new drawings. access the command by:

1. **Command Line:** *XL*
2. **Menu Bar:** *Draw* ⇒ *Construction Line*
3. **Draw Bar :** 

An Xline is a line with infinite length, therefore having no end points, but does have a root which is the theoretical midpoint.

Specify a point or [Hor/ Ver /Ang / Bisect / Offset]

The Xline command provides several options that allow creating specific types of construction lines.

Options:

Hor: the horizontal option forces all the lines to be exactly horizontal.

Ver: the vertical option forces all the lines to be exactly vertical.

Ang: the angle option use to create construction lines at angles other than 0 or 90 degrees.


Offset: offsetting a line means creating the line at a specific distance from another line.

Bisect: this option draws the xline at an angle between two selected points.

Some Commands used to modify the drawing:

Erase

This command use to delete objects. Access the command from:

1. **Menu bar: Modify ⇔ Erase**
2. **Command line: Erase or E**
3. **Draw bar: **

When use the command, the program require about objects needs to delete by display message:

Command: Erase

Select Objects :


The indicator change to small square ,selected objects by three ways

1. Pick the objects. this default option is used for selecting one object at a time.
2. crossing window. all objects within and crossing through a crossing window are elected.(drag to the left to form a crossing window).
3. window. only objects completely within the window are selected. not objects that cross through or outside the window.(ragging to the right creates a window instead).

(Remark: Oops command lets to undo the last erase you are doing)

Move

This command use to move objects to new locations. access the command by:

1. **Menu bar: Modify ⇔ Move**
2. **Command line: Move or M**
3. **Draw bar: **

When use move command, the program require the following:

Command: Move


Select Objects:

Specify base point or displacement:

Specify second point of displacement:

Copy

The copy command copy single object or group of objects. access the command by:

1. **Menu bar: Modify ⇔ copy**
2. **Command line: copy or co or cp**
3. **Draw bar: **

When use copy the program require the following:

Command: Copy


Select Objects:

Specify base point or displacement or [Multiple]:

Specify second point of displacement:

Offset

This command use to draw object parallel to selected object by determine distance. access the command by:

1. **Menu bar:** *Modify* ⇒ *offset*
2. **Command line:** *O*
3. **Draw bar:** 

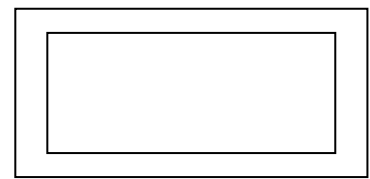
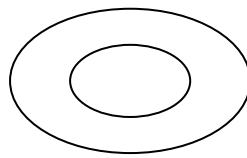
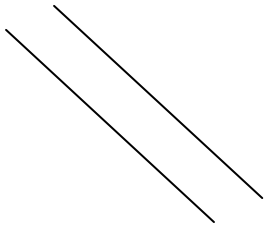
When use offset command the program require parallel distance.

Command: *Offset*

Specify offset distance or [through]:


Select object to offset or <exit>:

Specify point on side to offset:



Mirror

This command use to do mirror to object. access the command by following ways:

1. **Menu bar:** *Modify* ⇒ *Mirror*
2. **Command line:** *Mi*
3. **Draw bar:** 

The program require the following:

Command: *Mirror*

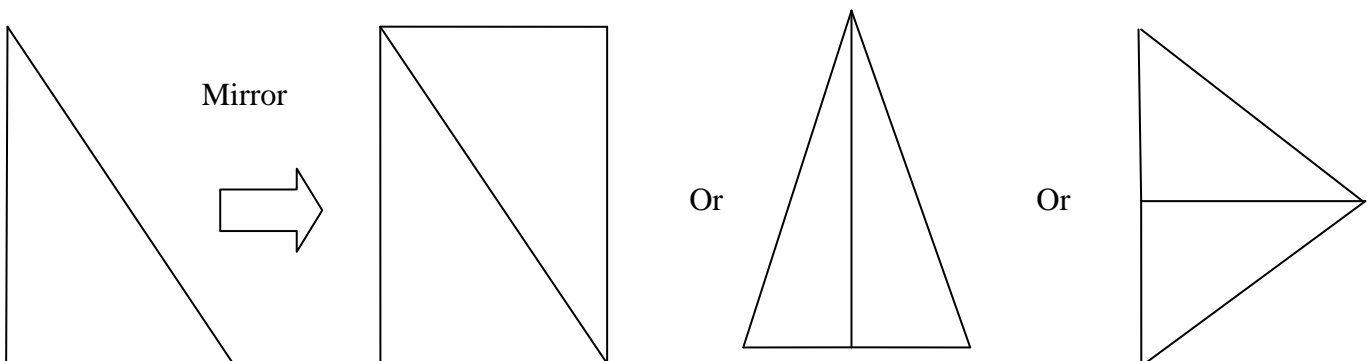
Select objects:

Specify first point of mirror line:

Specify second point of mirror line:


Delete source object?[yes/no]:

Example: draw the left half of the figure then mirror the objects to create the right half.



Trim

This command allows to trim (shorten) the end of an object back to the intersection of another object. The middle section of an object can also be trimmed between two intersecting objects. Access the command by:

1. **Menu bar:** *Modify* ⇨ *trim*
2. **Command line:** *trim* or *tr*
3. **Draw bar:** 

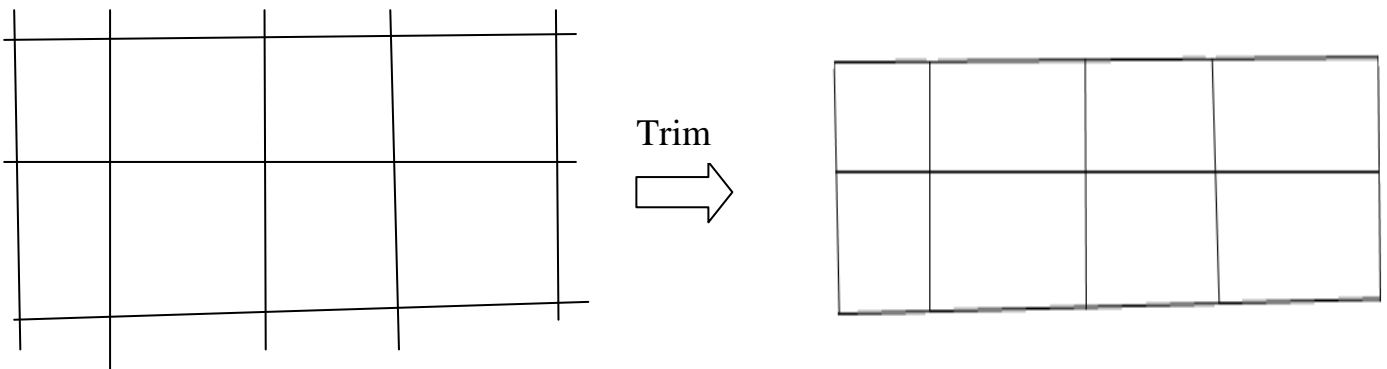
Command: *Trim*

Current settings: *Projection= UCS=None*

Select cutting edges:

Select object to trim or [Project / Edge / Undo]:

Example:



Extend

Extend command use to length object to meet another object. The objects can be extended include arc, ellipse, lines, Mlines, rays. Access the command by:

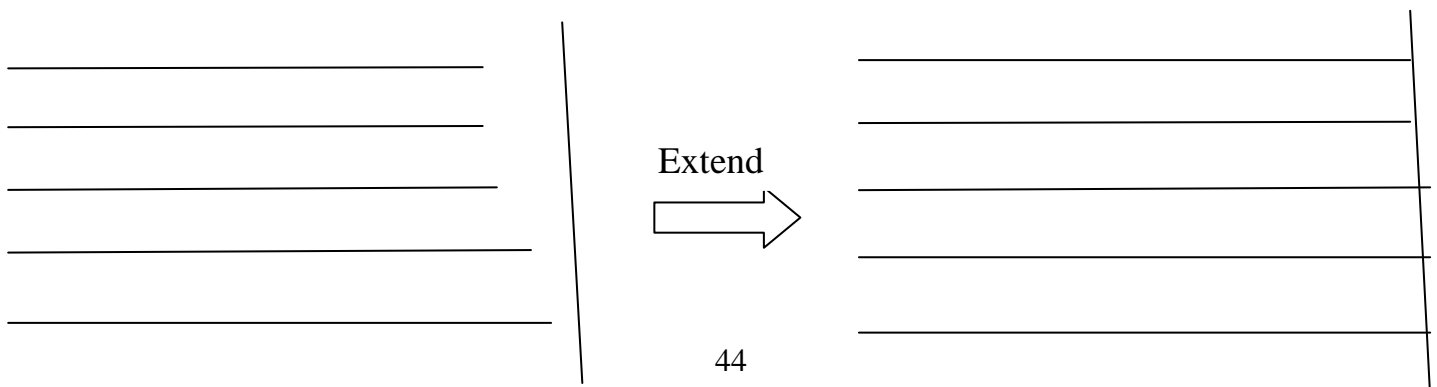
1. **Menu bar:** *Modify* ⇨ *Extend*
2. **Command line:** *Extend* or *Ex*
3. **Draw bar:** 

Current settings: *Projection= UCS=, Edge=None*

Select boundary edges

Select object to extend or [Project / Edge / Undo]:

Example:



Break

This command use to break object. Access the command from following:

1. **Menu bar: Modify ⇨ Break**
2. **Command line: Break or Br**
3. **Draw bar: **

When use the command , the program require the following:

Select Object:


Specify second break point or [First Point]:f

Specify First break point:

Specify second break point:

Rotate

This command use to rotate sleeted objects around point by determining angle. access the command by:

1. **Menu bar: Modify ⇨ Rotate**
2. **Command bar: Rotate or RO**
3. **Draw bar: **

When use the command ,the program require the following:

Select objects:

Specify base point:

Specify rotation angle or [Reference]:

Scale

This command use to zoom in or zoom out the drawing in draw board .access the command by:

1. **Menu bar :Modify ⇨ Scale**
2. **Command line :Scale or Sc**
3. **Draw bar **

Select objects:

Specify base point:

Specify scale factor or [Reference]:

Lengthen

From this command can know length of selected line ,and do changes to line length ,access the command by:

1. **Menu bar :Modify ⇨ Lengthen**
2. **Command line :Len**
3. **Draw bar **

The following message appear:

Select an object or [Delta / Percent / Total / Dynamic]:

Options:

DELta: in this option determine increment or decrement in length ,then click the object ,the object is lengthen in determined value.

Percent: in this option determine length percentage to original length .for example: 110 mean increment 10%, 90 mean decrement 10 %.

Total: determine all length value to object.

DYNAMIC: in this option using mouse to increment or decrement object to new location.

Stretch

This command stretch selected object from selected side. can access the command from:

1. **Menu bar** :*Modify* ⇌ *Stretch*
2. **Command line** : *S*
3. **Draw bar** 

The following message appear:


Select objects to stretch by crossing window or crossing polygon:

Specify base point or displacement:

Specify second point of displacement:

Fillet

This command used to change two object meeting to meeting by circular arc. can access the command from:

1. **Menu bar** :*Modify* ⇌ *Fillet*
2. **Command line** : *Fillet*
3. **Draw bar** 

Options:

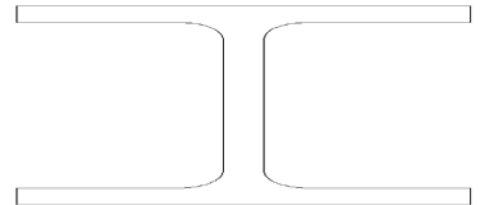
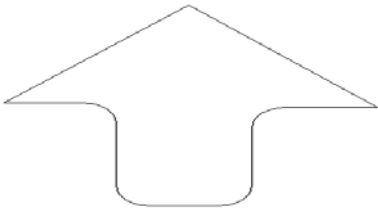
Select first object: this option require select first object.

Poly line: this option used when the base object is pl and wants circular all anglers by this option.

Radius: this option used to determine radius of fillet.


Trim: to distinguish between trim original lines or no trim.

Example: draw the following figures:

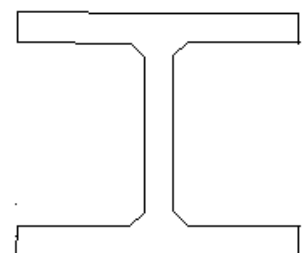
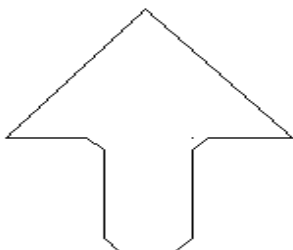


Chamfer

This command used to change two object meeting to meeting by line. can access the command from:

1. **Menu bar** :*Modify* ⇌ *chamfer*
2. **Command line** : *Chamfer*
3. **Draw bar** : 

Example: draw the following figures:

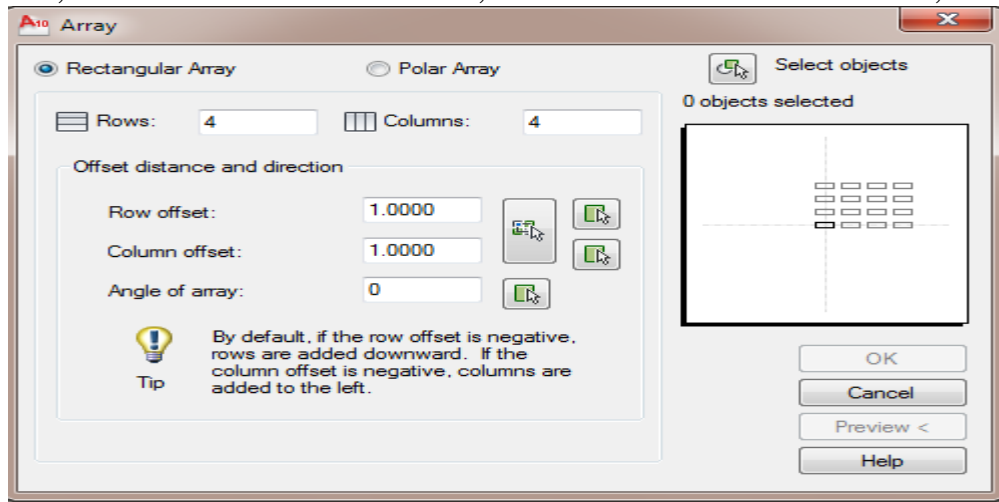


Array

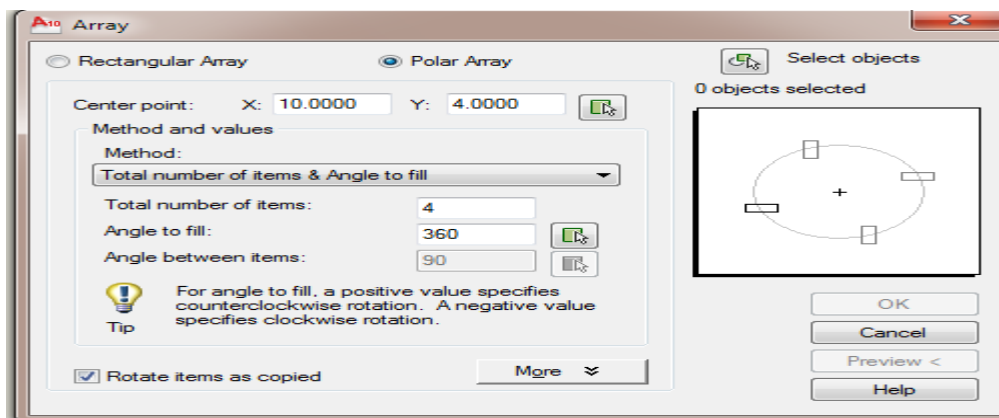
This command used for create multiple copies of object in the pattern, Can create rectangular array or polar array.. can access the command from:

1. **Menu bar** :*Modify* ⇌ *array*
2. **Command line** : *array*
3. **Draw bar** : 

In choice the rectangular array following message box appear. Determine number of rows and number of columns, the distance between rows ,the distance between columns, and array direction.



In choice the Polar array following message box appear. determine total number of items, angle to fill, angle between items




Explode

This command used to destroy the connection between one object .for example if we draw polygon , we cannot modify one side from polygon such as (copy ,move, erase, mirror,.....),after execute the command explode we can apply (copy ,move, erase, mirror,.....) to each side of polygon. Can access the command from:

1. **Menu bar** :*Modify* ⇌ *Explode*
2. **Command line** : *Exp*
3. **Draw bar** : 

Layers

The way to gain complete layer control is through the Layer Properties Manager . the Layer Properties Manager is invoked by:

1. **Command line Window: Layer or LA**
2. **Tool Bar: format ⇌ Layer**
3. **layer properties manager:** 

Command:- Layer

Current Layer:"0"

Enter an option

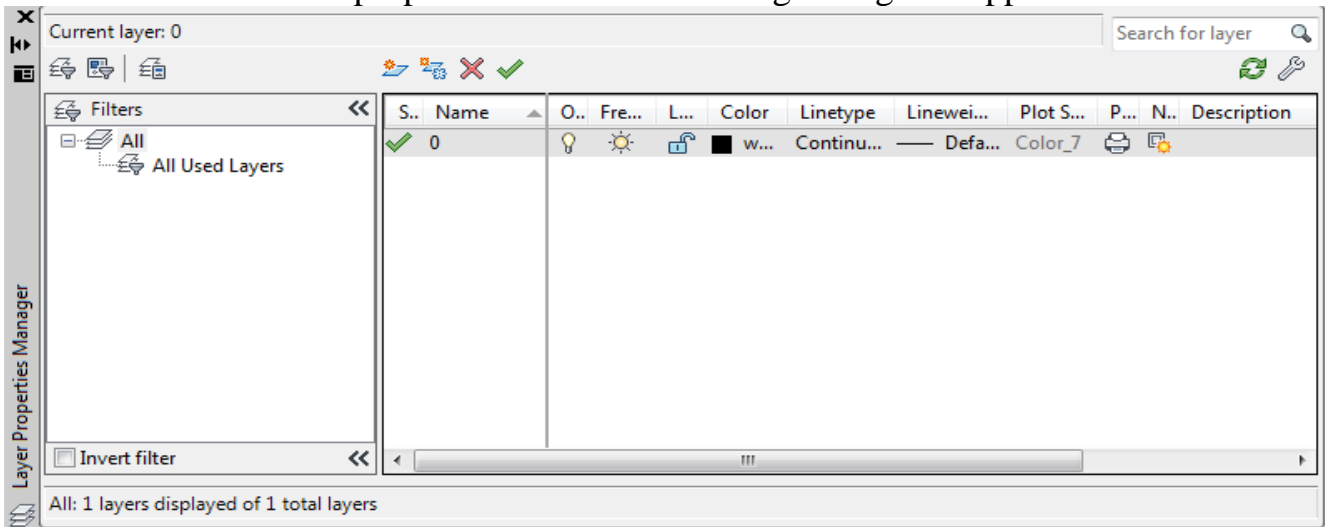
[?/Make/Set/New/On/Off/Color/Ltype/Lweight/Plot/Pstyle/Freeze/Thaw/Lock/Unlock/stAte]:

Layer Properties manager Layer List

The right central area of the layer properties manager is the layer list that displays the list of layers in the drawing. here you can control the current visibility settings and the properties assigned to each layer. this list can display all the layers in the drawing or a subset of layers if a layer filter is applied. layer filter are created and applied in the filter tree view on the left side of the layer properties manager. for new drawings such as those created from the AutoCAD . dwt template. only one layer may exist in the drawing layer"0".new layers can be created by selecting the new layer button or the new layer option of the right click menu.

Steps of Create Layers:

1. Click  on the left of properties bar. The following dialog box appear.



2. Click **(New)** ,new raw adding to existing layers. we saw always there was first layer it is zero layer which created by AutoCAD Automatically when open new drawing . Appeare in new raw name of new layer we can change it to objective name to easily access to layer we need. such as wall, column, steel, ground.....
3. To determine layer color click on black square under address **(color)** in new raw color window appear select from it appropriate color.
4. To determine line style click on **(continuous)** in new raw under address **(line type)** , window appear ,select from it appropriate line type .click on **(load)** to appear more line types.
5. To determine line weight used for drawing objects click **(default)** under address **(line weight)** then select weight we need from the window that appear.
6. Repeat the operation for other layers then click(**ok**).

Layers Managements


*Select drawing layer to be activate.

1. Click on manager Layer List.
2. Select layer from it.
3. Click on drawing board .the selected layer be the active layer .note that object color and line type and line weight all must be assistant to(**By layer**).


*move drawing object from layer to another.

1. Select drawing object.
2. Click on manager Layer List to open it.
3. Select layer want to move the object to it.
4. Click on ESC twice to undo select object ,we saw change the layer color and line to color of selected layer.


*hid objects belong to determine drawing layer.

1. Click on manager Layer List to open it.
2. Click on yellow light  for layer wants to hid it by put it to off then click on enter we obtain the drawing without the selected layer.

*lock objects belong to determine layer.

1. Click on manager Layer List to open it.
2. Click on lock button  for layer wants to lock it then click enter ,the layer is locked. (the locked layer it is the layer that cant change or modified to it unless we open it by click the lock button again.

*change color of drawing layer.

1. Click on  properties bar, the dialog box appear for control layers and lines types.
2. Click on color ,color control box appear.
3. Select appropriate color.
4. Click ok in two open boxes to close them we saw all the objects belong to the layer their color are change to new color.

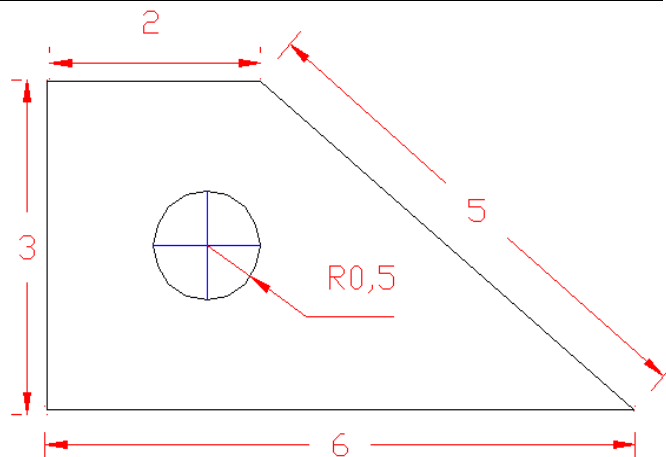
Example – 1:Create the following layers:

<i>Layer Name</i>	<i>Color</i>	<i>Line Type</i>	<i>Line Weight</i>
0	White	Continuous	Default
Border	cyan	Continuous	0.50mm
Center	Magenta	Center	0.20mm
Dimensions	blue	Continuous	0.20mm
Hidden	green	Hidden	0.30mm
Notes	Magenta	Continuous	0.30mm
Objects	red	Continuous	0.40mm
Phantom	yellow	Phantom	0.50mm

<i>Layer Name</i>	<i>State</i>	<i>Color</i>	<i>Line Type</i>	<i>Line Weight</i>
0	Frozen	White	Continuous	Default
Border	On	cyan	Continuous	0.50mm
Center	On	yellow	Center	0.20mm
Dimensions	On	green	Continuous	0.20mm
Hidden	On	yellow	Hidden	0.30mm
Objects	On	red	Continuous	0.60mm
Phantom	On	Blue	Phantom	0.50mm
Text	Frozen	Magenta	Continuous	0.30mm

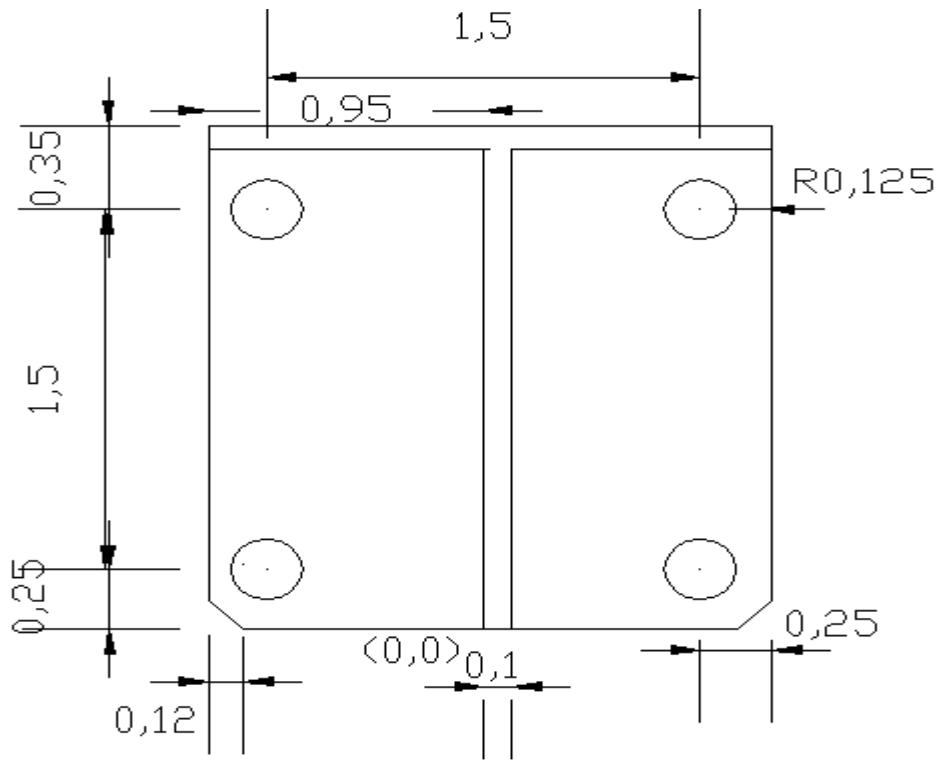
Example – 2. Setup the layers shown in the following table, then create the slide shown in figure.

<i>Layer Name</i>	<i>Color</i>	<i>Line Type</i>	<i>Line Weight</i>
Objects	White	Continuous	0.40mm
Center	blue	Center2	0.20mm
Dims	red	Continuous	Default



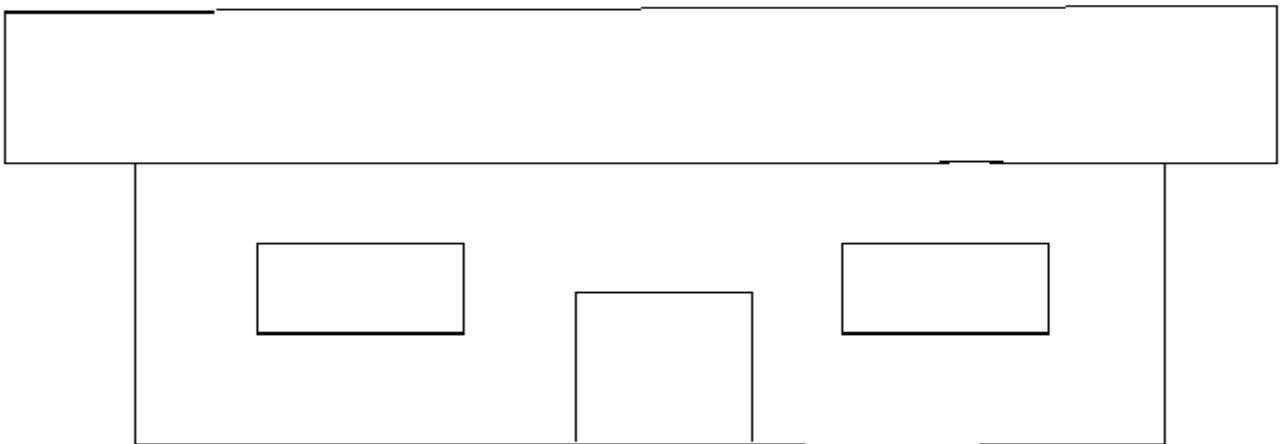
- **Hide layer Dims.**
- **Lock layer center.**
- **Change layer objects color from white to green.**

Example – 3. Create the mounting bracket drawing shown below. Place the bracket on layer objects. then dimension the bracket on a layer named dimensions.



Example – 4. Setup the layers shown in the following table, then create the house shown in figure.

<i>Layer Name</i>	<i>Color</i>	<i>Line Type</i>	<i>Line Weight</i>
Walls	White	Continuous	0.40mm
Windows	blue	Center2	0.20mm
Door	red	Continuous	Default

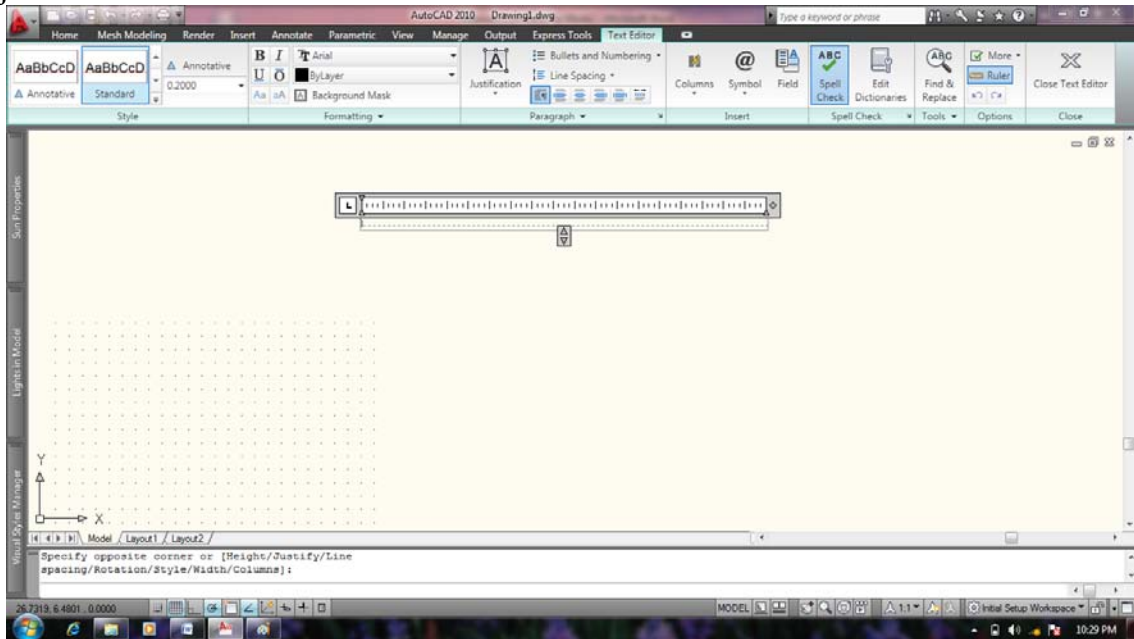


- **Hide layer windows.**
- **Lock layer door.**
- **Change layer walls color from white to yellow.**

Text

AutoCAD supplies two different types of text objects:

1. The Dtext command inserts one or more lines of text as single line objects. The Dtext command enables you to display AutoCAD text dynamically in the drawing as you type it. It also allows you to justify, or align, the text in several ways, including left, right, and center justification.
2. The Mtext Command treats one or more paragraphs of text as single objects. The Mtext command creates a multiple line object called Mtext. AutoCAD uses a text editor to create Mtext objects.



Access the command by:

1. **Command Line** : *Mtext*
2. **Menu Bar** : **Draw** ⇨ *text*
3. **Draw Bar** : 

Command: *text*

Specify start point of text or [justify / style]:

Specify height <default height>:

Specify rotation angle of text < 0 >:

Enter text:

Dimensions

AutoCAD dimensioning is semi automatic ,when you invoke a command to create a linear dimension ,AutoCAD only requires that you Pick an object or specify the extension line origins ,and pick the location of the dimension line .AutoCAD then measures the feature and draws the extension line ,arrow heads ,and dimension text.

- **Linear dimensions:** are those with horizontal, vertical, or aligned dimension lines. a dimension line is the part of the dimension that typically contains arrowheads at each of its ends.

Command: *dim linear*

Specify first extension line origin or <select object>:

Select object to dimension:

- **Dimensioning Round Features:** use radius dimensions for features such as fillets and rounds.

Command: *dim Diameter*

Select arc or circle:

Select object to dimension:

- **Dimensioning Angles:** Dimension the angles.

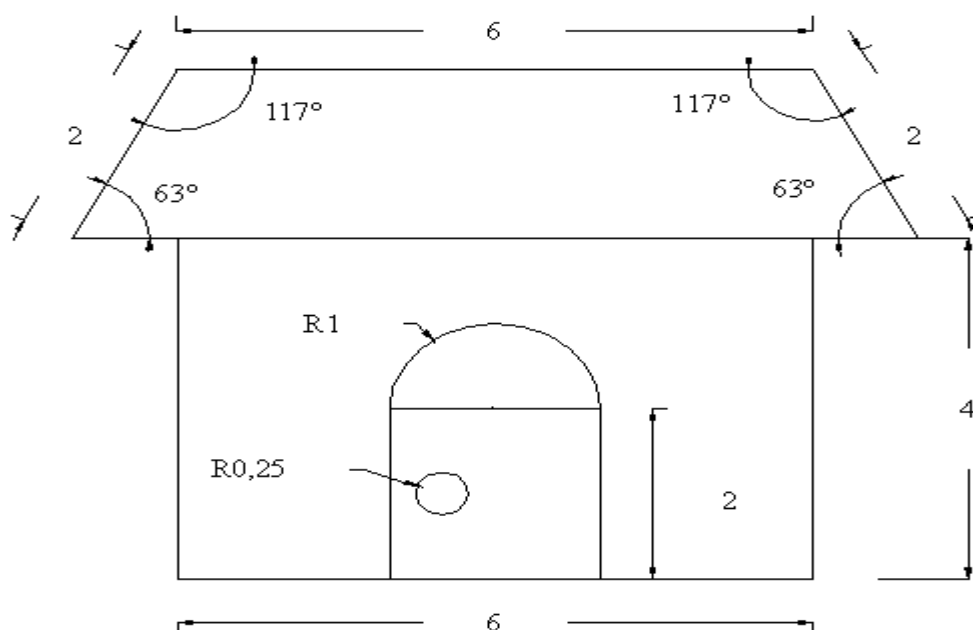
Command: *dim Angular*

Select arc, line or (specify vertex):

Specify second angle end point:

Specify dimension arc line location or [Mtext ,text, angle]:

Example: add dimensions to the following figure:

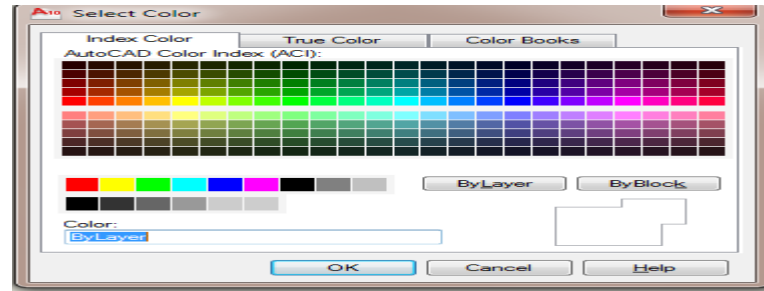


Assigning Colors

AutoCAD offers a command named color that allows you to set the color for subsequently drawn objects, regardless of the current layer. therefore , you can control the color of each object individually.

To access the command by:

1. **Command Line Window:** *Color or Col*
2. **Tool Bar:** *format* ⇒ *color*
3. **layer properties manager:** ByLayer

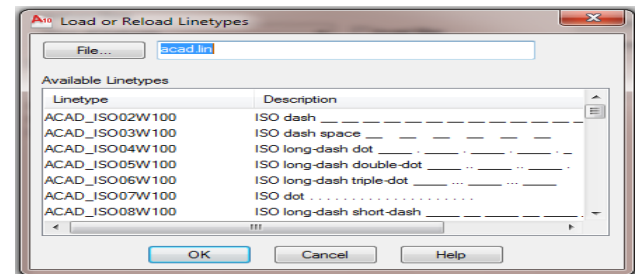


Assigning Line types

Various types of lines are used in drafting to show different elements of a drawing. by convention, for example, hidden lines(those that would not be visible if you were looking at the actual object) are shown as dashed or broken lines. Center Lines(imaginary lines that mark the exact center of an object or feature) are shown by a series of long and short line segments.

To access the command by:

1. **Command line Window:** *line type or l type or lf*
2. **tool bar:** *format* ⇒ *line type*
3. **layer properties manager:** ByLayer

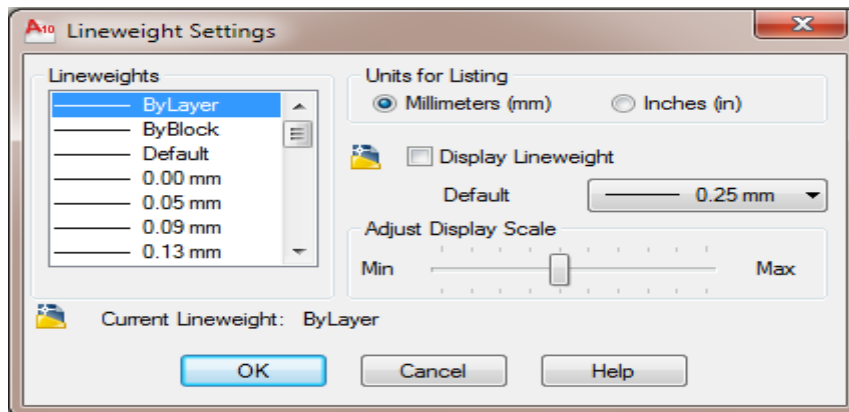


Setting Line weights

Line weights are important in technical drawing. for example, object lines should be thicker so they stand out more than dimensions. normally , object lines are thick ,hidden lines and text are of medium thickness, and center lines, dimensions, and hatch lines are thin.

To access the command by:

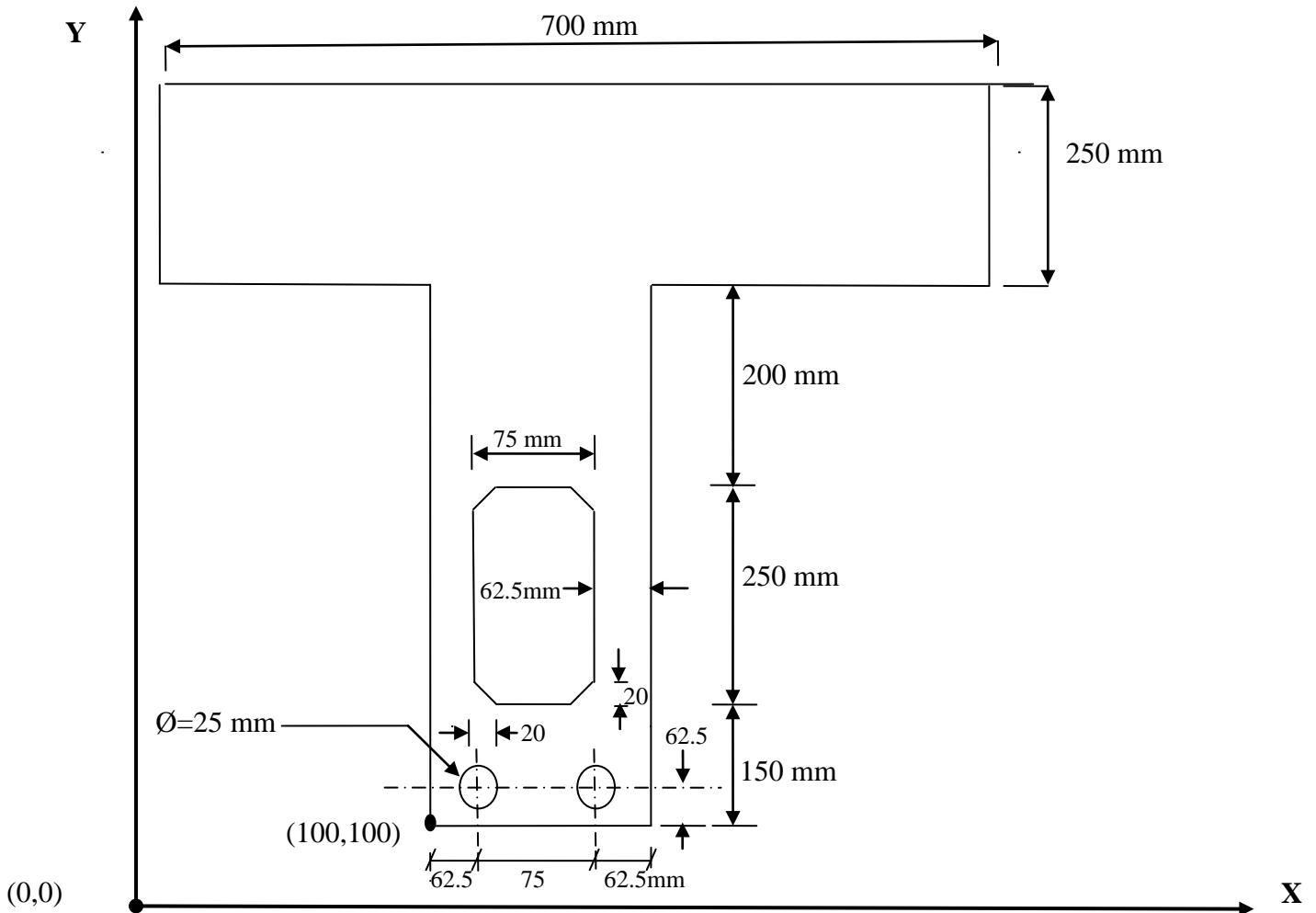
1. **Command line Window:** *Lweight or lw*
2. **Tool Bar:** *format* ⇒ *line weight*
3. **layer properties manager** ByLayer



Exams Questions

Q: using AutoCAD program draw the following figure on board its sides(1000×1000mm) ,if you know the lower left side of figure is far 100 mm horizontally and 100 vertically, from original point. apply:

1. Absolute Coordinate System.
2. Relative Polar Coordinate System.



I. Solve using Absolute Coordinate System

Command: Line (enter)
 Specify first point: 100,100
 Specify next point: 300,100
 : 300,700
 : 550,700
 : 550,950
 : -150,950
 : -150,700
 : 100,700

Command: Rectangle
 Specify first corner point: C
 Specify first distance chamfer: 20
 Specify second distance chamfer: 20
 Specify first corner point: 162.5,250
 Specify second corner point: 237.5,500

Command: Circle
 Specify center point of circle: 162.5,162.5
 Specify radius of circle: 12.5

Command: Circle
 Specify center point of circle: 237.5,162.5
 Specify radius of circle: 12.5

1. Solve using Relative Coordinate System

Command: Line (enter)
Specify first point:100,100
Specify next point:@700,0
 :**@0,250**
 :**@-250,0**
 :**@0,600**
 :**@-200,0**
 :**@0,-600**
 :**@-250,0**
 :**@0,-250**

Command: Rectangle
Specify first corner point: C
Specify first distance chamfer:20
Specify second distance chamfer:20
Specify first corner point:412.5,550
Specify second corner point::@75,250

Command: Circle
Specify center point of circle:412.5,887.5
Specify radius of circle: 12.5

Command: Circle
Specify center point of circle:487.5,887.5
Specify radius of circle: 12.5

2.Solve using Relative Polar Coordinate System

Command: Line (enter)
Specify first point:100,100
Specify next point: @700<0
 :**@250<90**
 :**@250<180**
 :**@600<90**
 :**@200<180**
 :**@600<270**
 :**@250<180**
 :**@250<270**

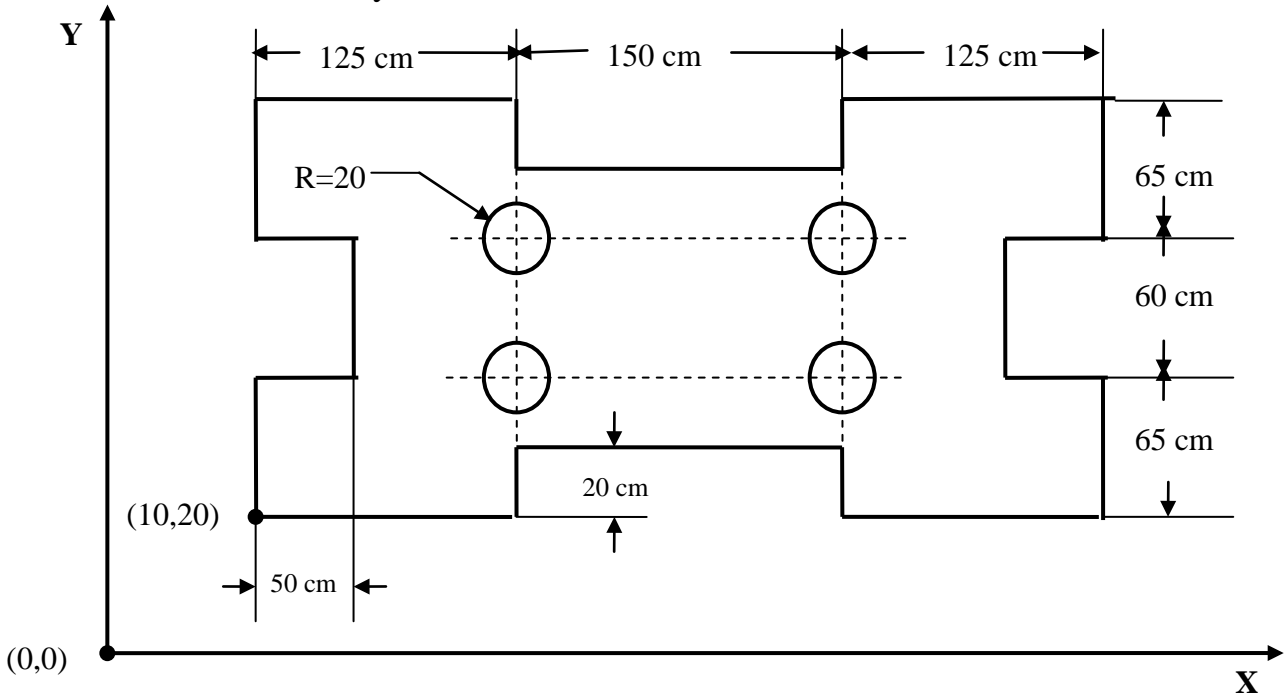
Command: Rectangle
Specify first corner point: C
Specify first distance chamfer:20
Specify second distance chamfer:20
Specify first corner point:412.5,550
Specify second corner point::@261<73.30

Command: Circle
Specify center point of circle:412.5,887.5
Specify radius of circle: 12.5

Command: Circle
Specify center point of circle:487.5,887.5
Specify radius of circle: 12.5

Q: using AutoCAD program draw the following figure on board its sides(500×500cm) ,if you know the lower left side of figure is far 10 mm horizontally and 20 vertically, from original point. Apply:

1. Absolute Coordinate System
2. Relative Polar Coordinate System



1. Solve using Absolute Coordinate System

Command: Line (enter)
Specify first point:10,20
Specify next point: 135,20
 135,40
 285,40
 285,20
 410,20
 410,85
 360,85
 360,145
 410,145
 410,210
 285,210
 285,190
 135,190
 135,210
 10,210
 10,145
 60,145

60,85
 10,85*
 10,20
Command: Circle
Specify center point of circle:135,85
Specify radius of circle: 20

Command: Circle
Specify center point of circle:285,85
Specify radius of circle: 20

Command: Circle
Specify center point of circle:135,145
Specify radius of circle: 20

Command: Circle
Specify center point of circle:285,145
Specify radius of circle: 20

2. Solve using Relative Polar Coordinate System

Command: Line (enter)

Specify first point:10,20

Specify next point:@125,0

@20<90

@150<0

@20<270

@125<0

@65<90

@50<180

@60<90

@50<0

@65<90

@125<180

@20<270

@150<180

@20<90

@125<180

@65<270

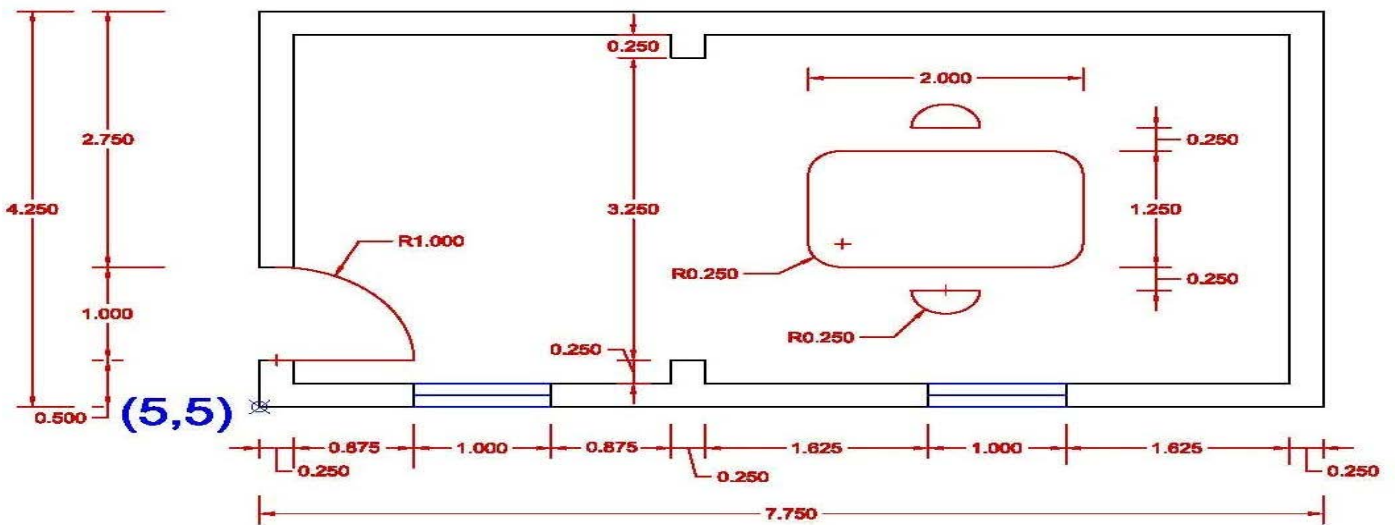
@50<0

@60<270

@50<180

@65<270

Q: using AutoCAD program draw the following figure on board its sides(20×20m) ,if you know the lower left side of figure is far(5m) horizontally and (5m) vertically, from original point. Apply: Relative Polar Coordinate System.



Solve using Relative Polar Coordinate System.

(Draw walls)

Command: Line

Specify first point:5,5

Specify next point:@7.750<0

:@4.250<90

:@7.750<180

:@2.750<270

@0.250<0

@2.500<90

@2.750<0

@0.250<270

@0.250 <0

@0.250<90

@4.250<0

@3.750<270

@4.250<180

@0.250<90

@0.250<180

@0.250<270

@2.750<180

@0.250<90

@0.250<180

@0.500<270

(draw left window)

Command: Line

Specify first point:6.125,5.125

Specify next point:@1<0

Command: Line

Specify first point:6.125,5

Specify next point:@0.250<90

Command: Line

Specify first point:7.125,5

Specify next point:@0.250<90

(draw right window)

Command: Line

Specify first point:9.875,5.125

Specify next point:@1<0

Command: Line

Specify first point:10.875,5

Specify next point:@0.250<90

Command: Line

Specify first point: 9.875,5

Specify next point:@0.250<90

(draw table)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:8.875,6.5

Specify other corner point: @2.358<32

(draw under chair)

Command: Line

Specify first point: 9. 625,6.250

Specify next point:@0.5<0

Command: arc

Specify start point:9.625,6.250

Specify center point:9.875,6.250

Specify the angle:180

(draw upper chair)

Command: Line

Specify first point: 9. 625,8

Specify next point:@0.5<0

Command: arc

Specify start point:10.125,8

Specify center point:9.875,8

Specify the angle:180

(draw the door)

Command: Line

Specify first point: 5.250,5.500

Specify next point:@0.875<0

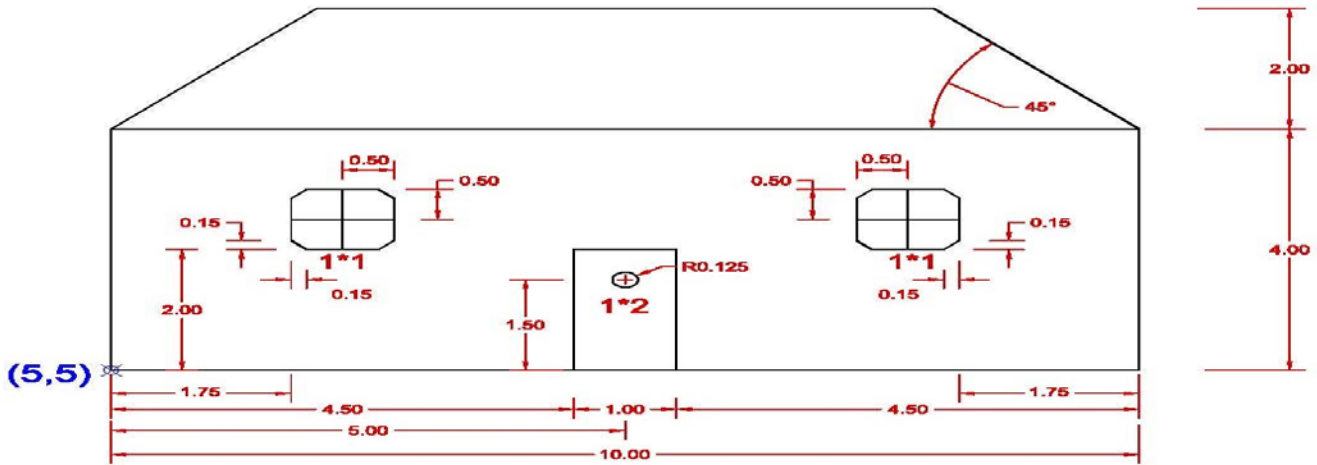
Command: arc

Specify start point:6.125,5.5

Specify center point:5.250,5.5

Specify the angle:90

Q: using AutoCAD program draw the following figure on board its sides(20×20m) ,if you know the lower left side of figure is far(5m) horizontally and (5m) vertically, from original point. Apply: Absolute Coordinate System.



Solve using Absolute Coordinate System

(draw walls)

Command:Line (enter)

Specify first Point:5,5

Specify next Point:15,5

15,9

13,11

7,11

5,9

5,5 or c

(draw upper line)

Command: Line(enter)

Specify first Point :5,9

Specify nextt Point 15,9

(draw the door)

Command:Line (enter)

Specify first Point :9,5,5

Specify next Point: 9,5,7

10,5,7

10,5,5

(draw the switch of door)

Command:Circle (enter)

Specify center point:10,6,5

Specify the radius:0.125

(draw left window)

Command:Rectangle (enter)

Command:Chamfer (enter)

Specify first chamfer distance for rectangle:0.15

Specify second chamfer distance for rectangle:0.15

Specify first corner point:6.75,7

Specify other cornerpoint:7.75,8

(draw horizontal line)

Command:Line (enter)

Specify first point:6.75,7.5

Specify next Point:7.75,7.5

(draw vertical line)

Command:Line(enter)

Specify first point:7.250,7

Specify next Point:7.250,8

(draw right window)

Command:Rectangle (enter)

Command:Chamfer

Specify first chamfer distance for rectangle :0.15

Specify second chamfer distance for rectangle: 0.15

Specify first corner point: 12.250,7

Specify other cornerpoint: 13.250,8

(draw horizontal line)

Command:Line (enter)

Specify first point :12.250,7.5

Specify next Point: 13.250,7.5

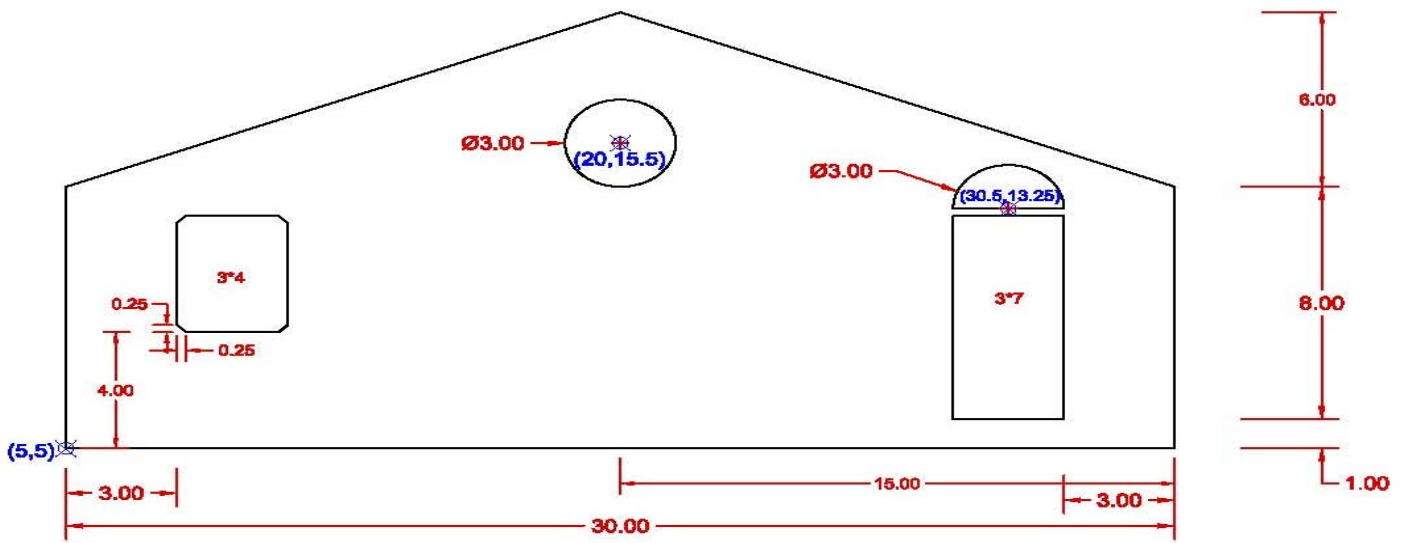
(draw vertical line)

Command:Line (enter)

Specify first point :12.750,7

Specify next Point :12.750,8

Q- using AutoCAD program, list steps execute the following figure in board its sides (20x20 ft)
Apply: Relative Coordinate System.



Solve using Relative Coordinate System

(draw hose line)

Command:Line (enter)

Specify first point :5,5

Specify next Point :@30,0

:@0,9

:@-15,6

:@-15,-6

:@0,-8

(draw left window)

Command:Rectangle (enter)

Command:Chamfer

Specify first chamfer distance for rectangle :0.25

Specify second chamfer distance for rectangle: 0.25

Specify first corner point: 8,9

Specify other cornerpoint:@3,4

(draw the center window)

Command:Circle (enter)

Specify center point:20,15.5

Specify the radius:1.5

(draw the door)

Command:Rectangle (enter)

Specify first corner point: 29,6

Specify other cornerpoint:@3,7

(draw arc line)

Command:Line (enter)

Specify first point :29,13.250

Specify next Point :@3,0

(draw arc)

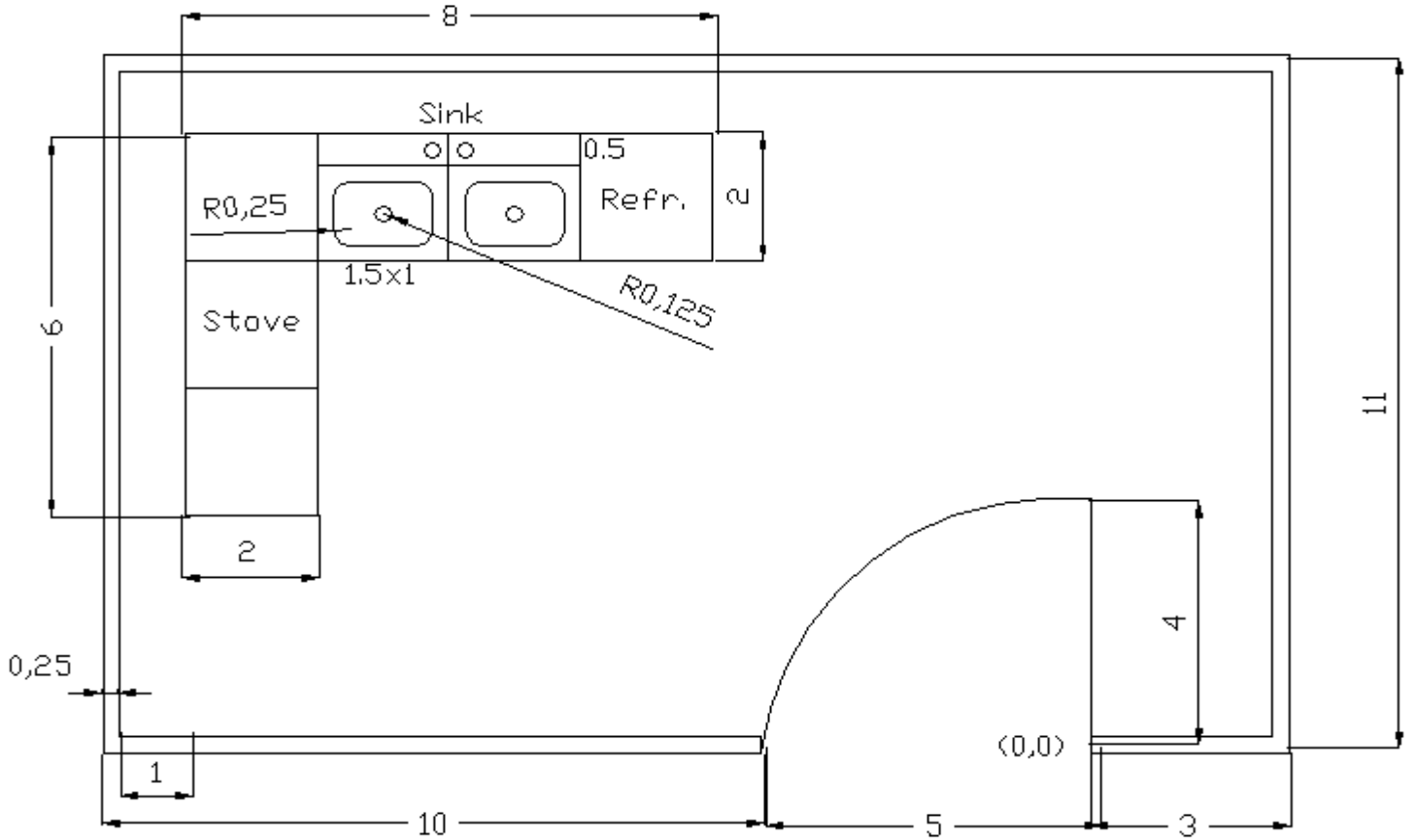
Command: arc

Specify start point:32,13.250

Specify center point:30.5,13.250

Specify the length:3

Q-. Using AutoCAD Program, draw the Kitchen floor plan on board its sides (20 x20 ft), Apply Absolute Coordinate System.



Solve using Absolute Coordinate System

(draw Wall lines)

Command:Line (enter)

Specify first point :0,0

Specify next Point :3,0

:3,11

:-15,11

:-15,0

:-5,0

:-5,0.250

:-14.750,0.250

:-14.750,10.750

:2.750,10.750

:2.750,0.250

:0,0.250

:0,0 or c

(draw the Sink)

Command: rectangle

Specify first corner point:-14.250,4.250

Specify other corner point: -12.250,6.250

Command: rectangle

Specify first corner point:-14.250,4.250

Specify other corner point: -12.250,8.250

Command: rectangle

Specify first corner point:-14.250,8.250

Specify other corner point: -12.250,10.250

Command: rectangle

Specify first corner point:-12.250,8.250

Specify other corner point: -10.250,10.250

Command: rectangle

Specify first corner point:-10.250,8.250

Specify other corner point: -8.250,10.250

Command: rectangle

Specify first corner point:-8.250,8.250

Specify other corner point: -6.250,10.250

Command:Line (enter)

Specify first point :-12.250,9.750

Specify next Point :-8.250,9.750

(draw left sink)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:-12,8.5

Specify other corner point: -10.5,9.5

Command :Circle

Specify the center Point: -11.250,9

Specify the radius:0.125

Command :Circle

Specify the center Point: -10.5,10

Specify the radius:0.125

(draw right sink)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:-10,8.5

Specify other corner point: -8.5,9.5

Command :Circle

Specify the center Point: -9.250,9

Specify the radius:0.125

Command :Circle

Specify the center Point: -10,10

Specify the radius:0.125

(draw the door)

Command:Line (enter)

Specify first point :0,0

Specify next Point :0,4

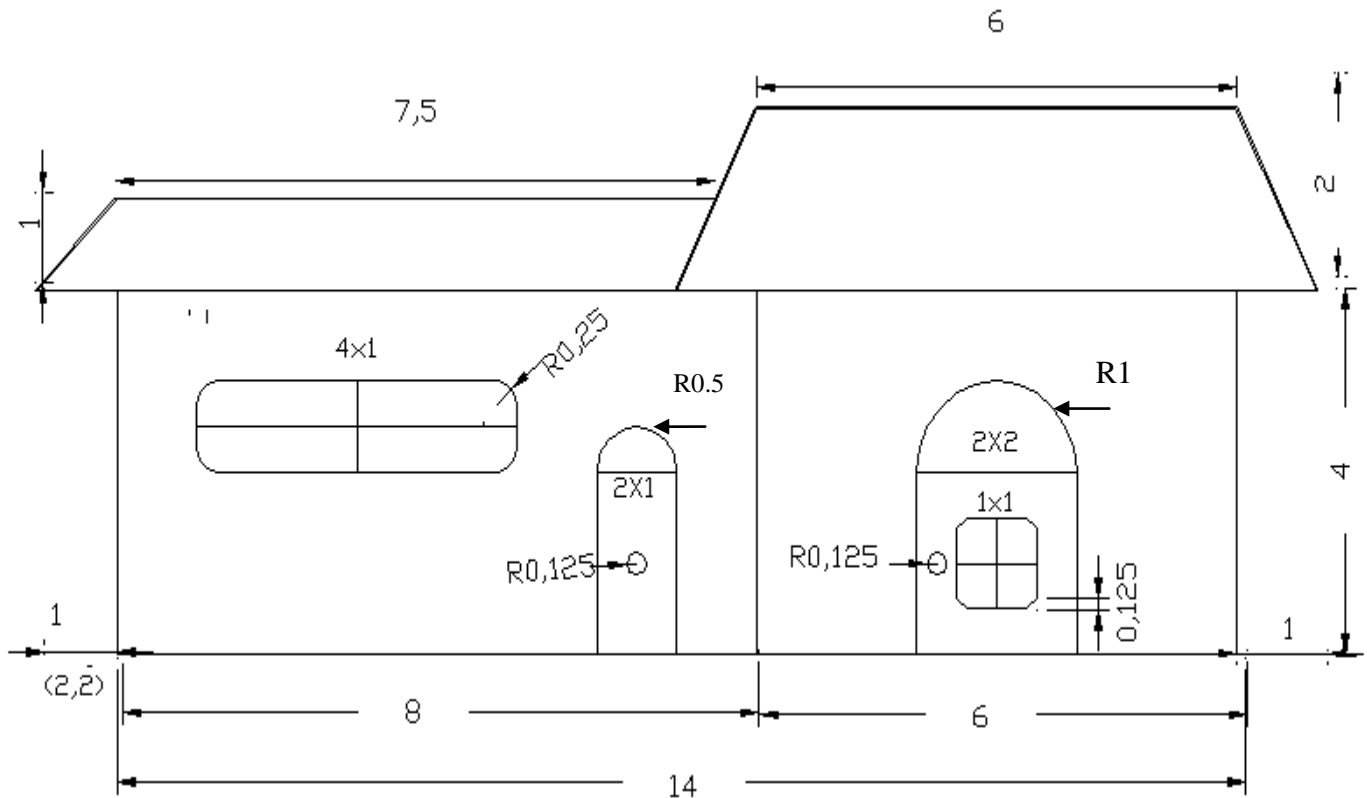
Command: arc

Specify 1^s point of arc:0,4

Specify end point:-5,0

Specify angle: 90

Q- Using AutoCAD Program, Draw the house on board its sides (20 x10m), Apply Relative Polar Coordinate System.



Solve using Relative Polar Coordinate System

(draw hose wall)

Command:Line (enter)

Specify first point :2,2

Specify next Point :@14.560<15.945

Command:Line (enter)

Specify first point :10,2

Specify next Point :@4<90

Command:Line (enter)

Specify first point :16,6

Specify next Point :@1<0

:@2.236<117

:@6<180

:@2.236<243

Command:Line (enter)

Specify first point :1,6

Specify next Point :@1.414<45

:@7.5<0

(draw window)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:3,4

Specify other corner point: @4.123<14.036

Command:Line (enter)

Specify first point :3,4.5

Specify next Point :@4<0

Command:Line (enter)

Specify first point :5,4

Specify next Point :@1<90

(draw the left door)

Command: rectangle

Specify first corner point:8,2

Specify other corner point: @2.236<63.434

Command :Circle

Specify the center Point: 8.5,3

Specify the radius:0.125

Command: arc

Specify 1^s point of arc:9,4

Specify center point:8.5,4

Specify angle: 180

(draw the right door)

Command: rectangle

Specify first corner point:12,2

Specify other corner point: @2.828<45

Command:Rectangle (enter)

Command:Chamfer

Specify first chamfer distance for rectangle :0.25

Specify second chamfer distance for rectangle: 0.25

Specify first corner point: 12.5,2.5

Specify other corner point:@1.414,45

Command:Line (enter)

Specify first point :12.5,3

Specify next Point :@1<0

Command:Line (enter)

Specify first point :13,2.5

Specify next Point :@1<90

Command :Circle

Specify the center Point: 12.250,3

Specify the radius:0.125

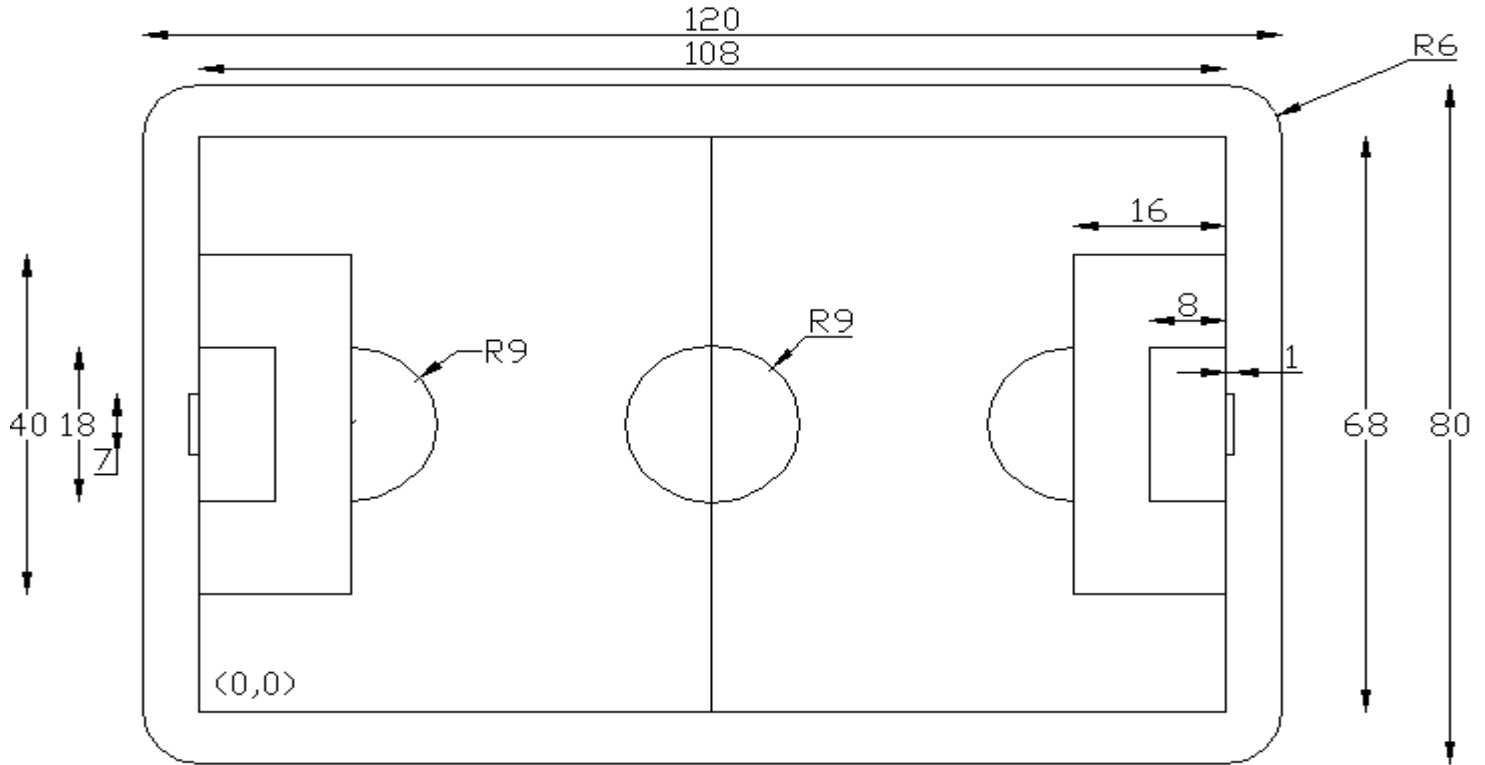
Command: arc

Specify 1^s point of arc:14,4

Specify center point:13,4

Specify angle: 180

Q- Using AutoCAD Program, Create the play ground on board its sides (150 x100 m), Apply Absolute Coordinate System.



Solve using Absolute Coordinate System

(draw left side)

Command: rectangle

Specify first corner point:0,0

Specify other corner point: 108,68

Command: rectangle

Command: fillet

Specify radius of fillet: 6

Specify first corner point:-6,-6

Specify other corner point: 114,74

Command: rectangle

Specify first corner point:-1,3.5

Specify other corner point: 0,37.5

Command: rectangle

Specify first corner point:0,25

Specify other corner point: 8,43

Command: rectangle

Specify first corner point:0,14

Specify other corner point: 16,54

Command: arc

Specify 1st point of arc:16,25

Specify center point:16,34

Specify angle: 180

(draw right side)

Command: rectangle

Specify first corner point:108,30.5

Specify other corner point: 109,37.5

Command: rectangle

Specify first corner point:100,25

Specify other corner point: 108,43

Command: rectangle

Specify first corner point:92,14

Specify other corner point: 108,54

Command: arc

Specify 1st point of arc:92,43

Specify center point:92,34

Specify angle: 180

(draw the center)

Command :Circle

Specify the center Point: 54,34

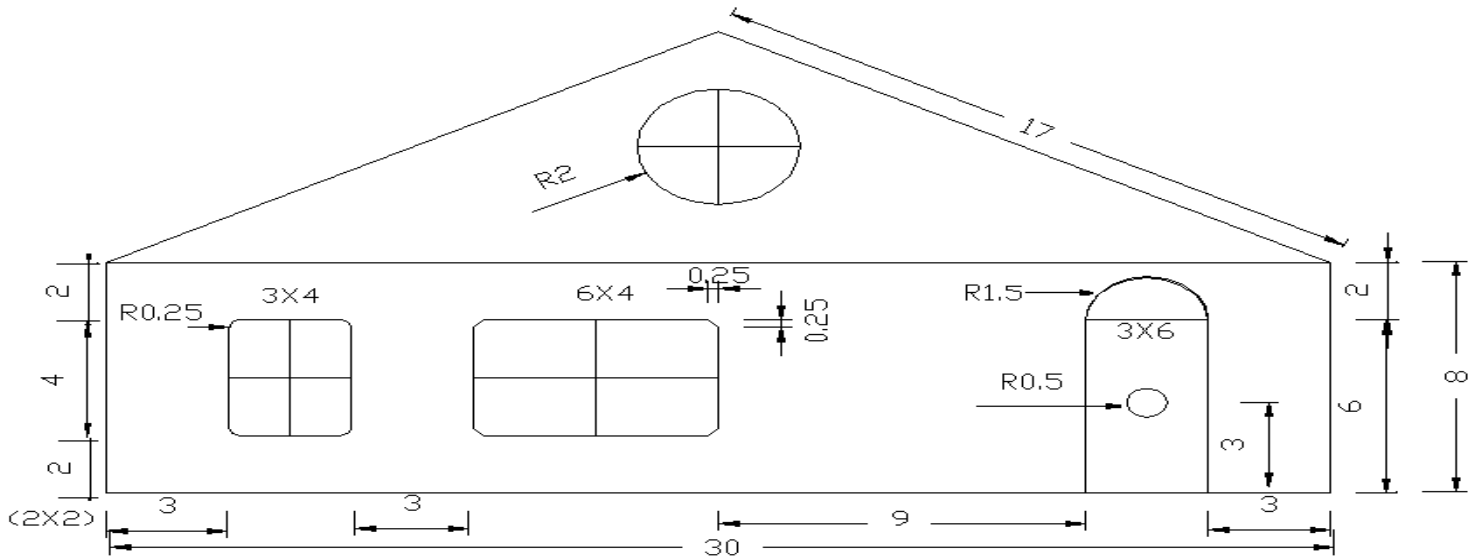
Specify the radius:9

Command:Line (enter)

Specify first point :54,0

Specify next Point :54,68

Q- Using AutoCAD Program, draw the simple house on board its sides (40 x20ft), if you know the lower left side of figure is far (2x2) from original point. Apply Relative Polar Coordinate System.



Solve using Relative Polar Coordinate System

(draw the walls)

Command: rectangle

Specify first corner point:2,2

Specify other corner point: @31.048<14.931

Command:Line (enter)

Specify first point :32,10

Specify next Point :@17<152

Specify next Point :@17<208

(draw the left window)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:5,4

Specify other corner point: @5<53.130

Command:Line (enter)

Specify first point :5,6

Specify next Point :@3<0

Command:Line (enter)

Specify first point :6.5,4

Specify next Point :@4<90

(draw the right window)

Command:Rectangle (enter)

Command:Chamfer

Specify first chamfer distance for rectangle :0.25

Specify second chamfer distance for rectangle: 0.25

Specify first corner point: 11,4

Specify other cornerpoint:@7.211<33.690

Command:Line (enter)

Specify first point :11,6

Specify next Point :@6<0

Command:Line (enter)

Specify first point :14,4

Specify next Point :@4<90

(draw the door)

Command: rectangle

Specify first corner point:26,2

Specify other corner point: @6.708<63.434

Command :Circle

Specify the center Point: 72.5,5

Specify the radius:0.5

Command: arc

Specify 1st point of arc:29,8

Specify center point:27.5,8

Specify angle: 180

(draw the upper window)

Command :Circle

Specify the center Point: 17,14

Specify the radius:2

Command:Line (enter)

Specify first point :15,14

Specify next Point :@4<0

Command:Line (enter)

Specify first point :17,12

Specify next Point :@4<90

Solve using Relative Coordinate System

(draw the walls)

Command: rectangle

Specify first corner point:2,2

Specify other corner point: @30,8

Command:Line (enter)

Specify first point :32,10

Specify next Point :@-15,8

Specify next Point :@-15,-8

(draw the left window)

Command: rectangle

Command: fillet

Specify radius of fillet: 0.250

Specify first corner point:5,4

Specify other corner point: @3,4

Command:Line (enter)

Specify first point :5,6

Specify next Point :@3,0

Command:Line (enter)

Specify first point :6.5,4

Specify next Point :@0,4

(draw the right window)

Command:Rectangle (enter)

Command:Chamfer

Specify first chamfer distance for rectangle :0.25

Specify second chamfer distance for rectangle: 0.25

Specify first corner point: 11,4

Specify other cornerpoint:@6,4

Command:Line (enter)

Specify first point :11,6

Specify next Point :@6,0

Command:Line (enter)

Specify first point :14,4

Specify next Point :@0,4

(draw the door)

Command: rectangle

Specify first corner point:26,2

Specify other corner point: @3,6

Command :Circle

Specify the center Point: 72.5,5

Specify the radius:0.5

Command: arc

Specify 1^s point of arc:29,8

Specify center point:27.5,8

Specify angle: 180

(draw the upper window)

Command :Circle

Specify the center Point: 17,14

Specify the radius:2

Command:Line (enter)

Specify first point :15,14

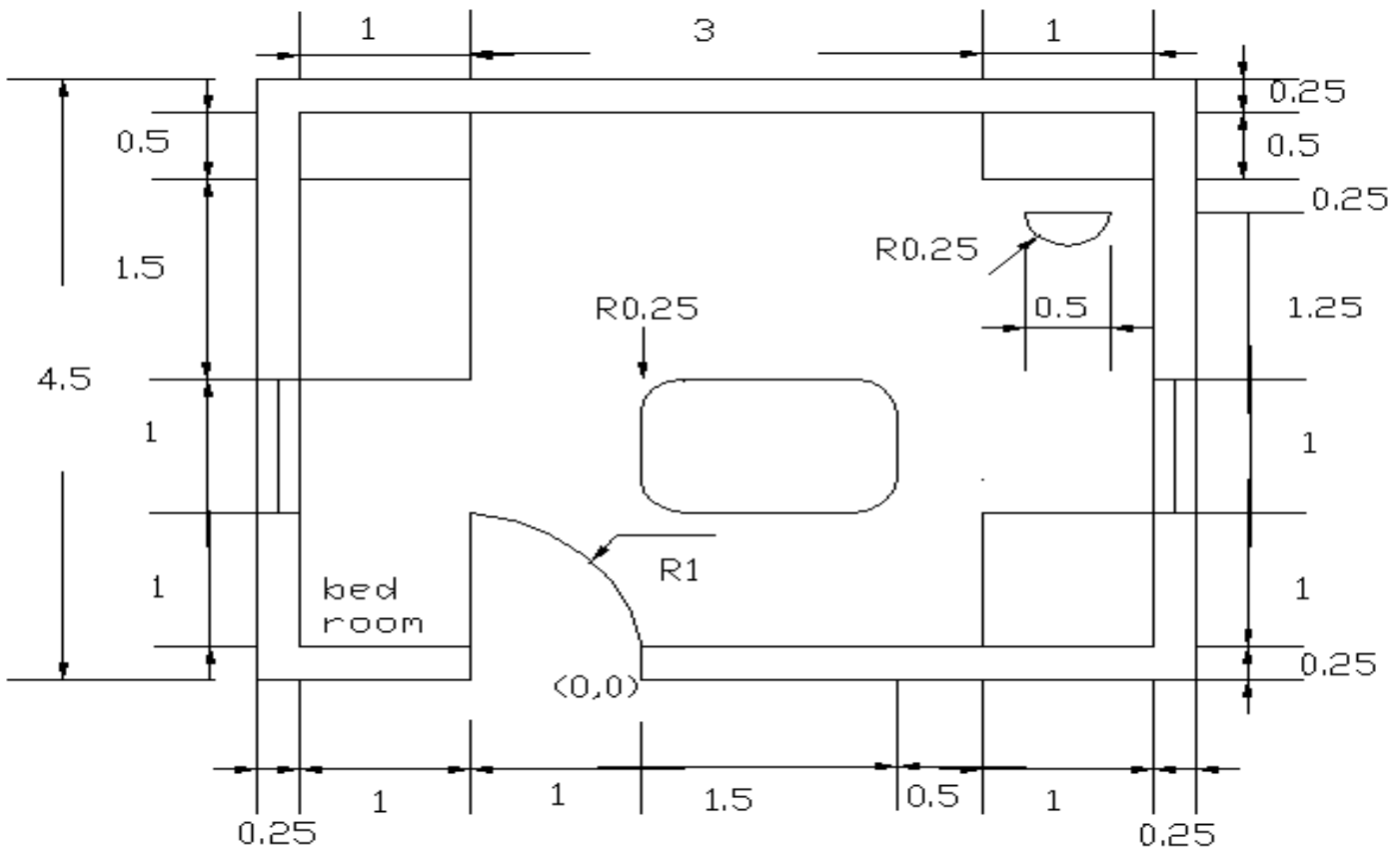
Specify next Point :@4,0

Command:Line (enter)

Specify first point :17,12

Specify next Point :@0,4

Q- Using AutoCAD Program, Draw the bed room floor plane on board its' sides are (6x6m).
 Note that the figure starts from original point (0, 0). Apply: **Absolute Coordinate System**.



Solve using Absolute Coordinate System

(Draw walls)

Command: Line (enter)
 Specify first point :0,0
 Specify next Point : 3.250,0
 :3.250,4.5
 :-2.250,4.5
 :-2.250,0
 :-1,0
 :-1,0.250
 :-2,0.250
 :-2,4.250
 :3,4.250
 :3,0.250
 :0,0.250
 :C

(Draw tables)

Command: rectangle
 Specify first corner point: 2,0.250
 Specify other corner point: 3,1.250

Command: rectangle
 Specify first corner point: 2,3.750
 Specify other corner point: 3,4.250

Command: rectangle
 Command: fillet
 Specify radius of fillet: 0.250
 Specify first corner point: 0,1.250
 Specify other corner point: 1.5,2.250

(Draw bed)

Command: rectangle
 Specify first corner point: -2,3.750
 Specify other corner point: -1,4.250

Command: rectangle
 Specify first corner point: -2,2.250
 Specify other corner point: -1,2.250

(Draw right window)

Command: Line (enter)
 Specify first point : 3.250,1.250
 Specify next Point : 3,1.250

Command: Line (enter)
 Specify first point : 3.250,2.250
 Specify next Point : 3,2.250

Command:Line (enter)
Specify first point : 3.125,1.250
Specify next Point : 3.125,2.250

(Draw left window)

Command:Line (enter)
Specify first point : -2,1.250
Specify next Point : -2.250,1.250

Command:Line (enter)
Specify first point : -2,2.250
Specify next Point : -2.250,2.250

Command:Line (enter)
Specify first point : -2.125,1.250
Specify next Point : -2.125,2.250

(Draw door)

Command:Line (enter)
Specify first point : -1,0.25
Specify next Point : -1,1.25

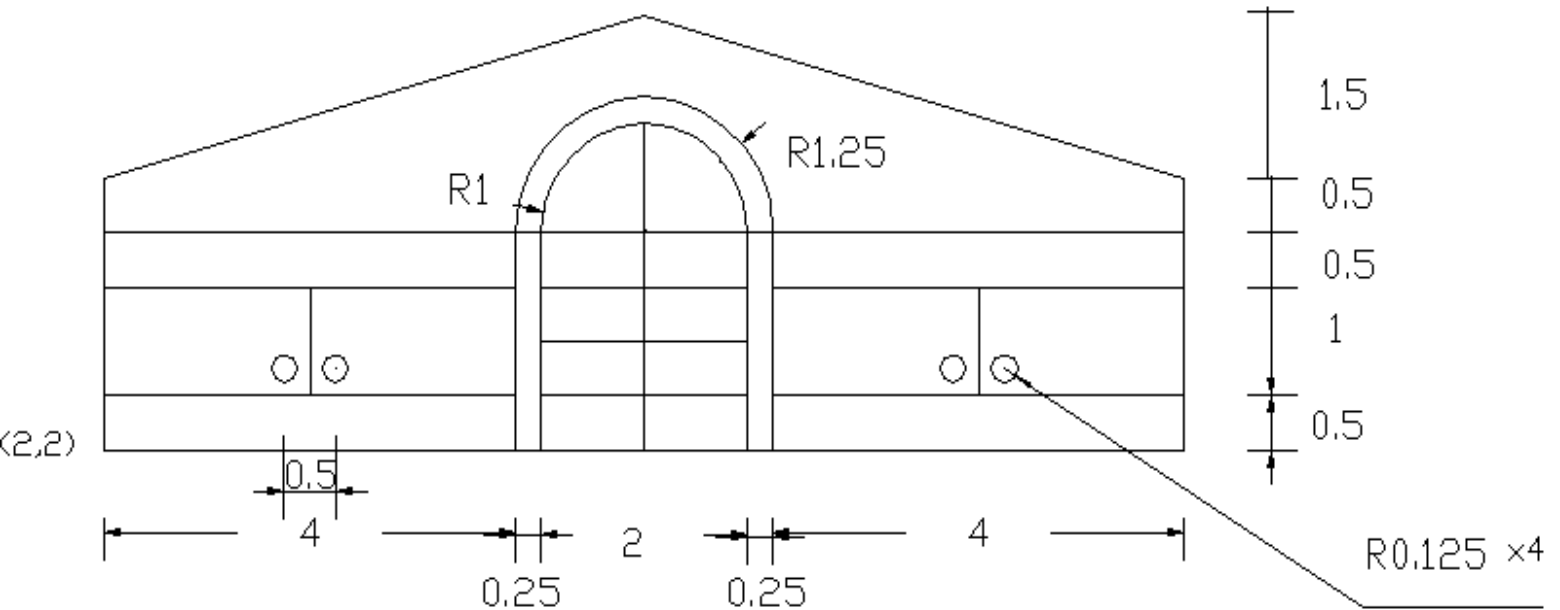
Command: arc
Specify 1^s point of arc: 0,0.250
Specify center point: -1,1.250
Specify angle: 90

(Draw chair)

Command:Line (enter)
Specify first point : 2.250,3.5
Specify next Point : 2.750,3.5

Command: arc
Specify 1^s point of arc: 2.250,3.5
Specify center point: 2.5,3.250
Specify end point: 2.750,3.5

Q-Using AutoCAD Program, draw the flowing figure on board its' sides are (13,5m).Apply :Relative Polar Coordinate System.



Solve using Relative Polar Coordinate System

(draw left side)

Command: rectangle

Specify first corner point: 2,2

Specify other corner point: @4.03<7.125

Command: rectangle

Specify first corner point: 2,2.5

Specify other corner point: @4.123<14.036

Command: rectangle

Specify first corner point: 2,3.5

Specify other corner point: @4.03<7.125

Command :Circle

Specify the center Point: 3.750,2.750

Specify the radius:0.125

Command:Line (enter)

Specify first point : 4,2.5

Specify next Point : @1<90

Command :Circle

Specify the center Point: 4.250,2.750

Specify the radius:0.125

(draw right side)

Command: rectangle

Specify first corner point: 8.5,2

Specify other corner point: @4.03<7.125

Command: rectangle

Specify first corner point: 8.5,2.5

Specify other corner point: @4.123<14.036

Command: rectangle

Specify first corner point:8.5,3.5

Specify other corner point: @4.03<7.125

Command :Circle

Specify the center Point: 10.250,2.750

Specify the radius:0.125

Command:Line (enter)

Specify first point : 10.5,2.5

Specify next Point : @1<90

Command :Circle

Specify the center Point: 10.750,2.750

Specify the radius:0.125

(draw the door)

Command: rectangle

Specify first corner point: 6,2

Specify other corner point: @2.015<82.87

Command: rectangle

Specify first corner point: 6.250,2

Specify other corner point: @2.828<45

Command: rectangle

Specify first corner point: 8.250,2

Specify other corner point: @2.015<82.87

Command:Line (enter)

Specify first point : 6.250,2.5

Specify next Point : @2<0

Command:Line (enter)

Specify first point : 6.250,3

Specify next Point : @2<0

Command:Line (enter)

Specify first point : 6.250,3.5

Specify next Point : @2<0

Command:Line (enter)

Specify first point : 6.250,4

Specify next Point : @2<0

Command:Line (enter)

Specify first point : 7.250,2

Specify next Point : @3<90

Command: arc

Specify 1st point of arc: 6.250,4

Specify center point: 7.250,5

Specify end point:8.250,4

Command: arc

Specify 1st point of arc: 6,4

Specify center point: 7.250,5.250

Specify end point:8.5,4

(draw upper side)

Command:Line (enter)

Specify first point : 2,4

Specify next Point : @0.5<90

Specify next Point : @5.46<15.94

:@5.46<344.06

:@0.5<270

Draw stove

Command: Rec

Specify first corner point:0.250,0.250

Specify other corner Point: @5.6565<45

Command : C

Specify center point for circle:1,1

Specify radius of circle:0.25

Command : C

Specify center point for circle:3.5,1

Specify radius of circle:0.25

Command : C

Specify center point for circle:1,3.5

Specify radius of circle:0.25

Command : C

Specify center point for circle:3.5,3.5

Specify radius of circle:0.25

Draw sink

Command: Rec

Specify first corner point:4.250,0.250

Specify other corner Point: @8.944<26.565

Command: Rec

Specify first corner point or []:F

Specify fillet radius for rectangles:0.5

Specify first corner point:4.5,0.5

Specify other corner Point: @8.276<25.016

Command : C

Specify center point for circle:8.25,2.25

Specify radius of circle:0.25

Draw left window

Command: Line

Specify first point :0,8.25

Specify next Point : @0.25<0

Command: Line

Specify first point :0,10.25

Specify next Point : @0.25<0

Command: Line

Specify first point :0.125,8.25

Specify next Point : @2<90

Draw right window

Command: Line

Specify first point :12.25,8.25

Specify next Point :@0.25<0

Command: Line

Specify first point :12.25,10.25

Specify next Point :@0.25<0

Command: Line

Specify first point :12.125,8.25

Specify next Point :@2<90

Draw table

Command: Rec

Specify first corner point: 2.250,8.250

Specify other corner Point: @8.246<14.03

Draw left down chair

Command: Line

Specify first point :3.25,7.25

Specify next Point :@2<0

Command: arc

Specify 1st point:3.25,7.25

Specify center point:4.25,7.25

Specify included angle:180

Draw right down chair

Command: Line

Specify first point :7.25,7.25

Specify next Point :@2<0

Command: arc

Specify first point of arc:7.25, 7.25

Specify second point of arc:8.25,6.25

Specify end point: 9.25, 7.25

Draw left up chair

Command: Line

Specify first point :3.25,11.25

Specify next Point :@2<0

Command: arc

Specify 1st point of arc:3.25,11.25

Specify center point of arc:2.25,11.25

Specify end point: 1.25,11.25

Draw right up chair

Command: Line

Specify first point :7.25,11.25

Specify next Point :@2<0

Command: arc

Specify 1st point:9.25,11.25

Specify center point:8.25,11.25

Specify length of chord: 2

Draw door

Command: Line

Specify first point :4.25,18.5

Specify next Point :@4<270

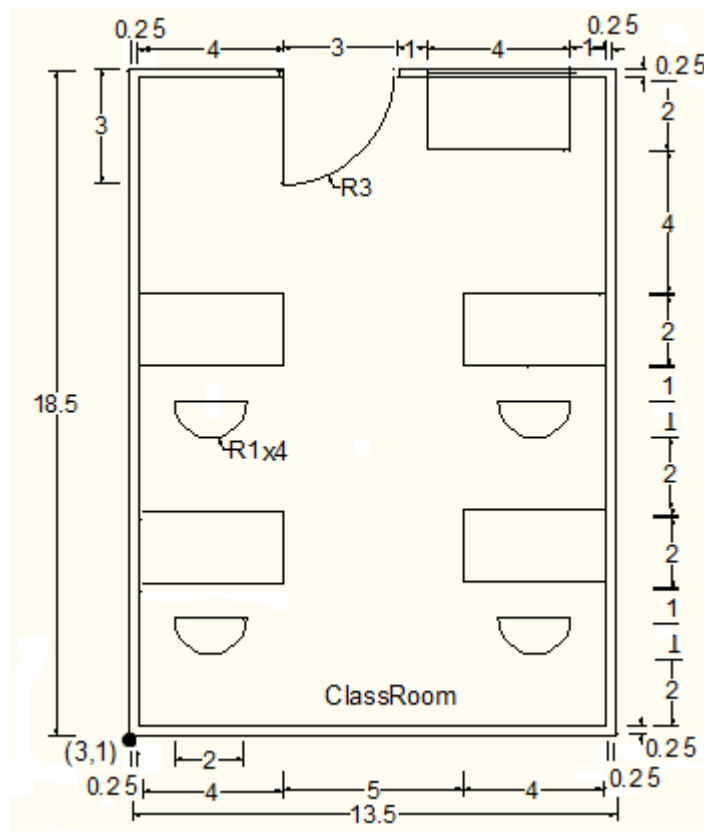
Command: arc

Specify 1st point:4.25,14.5

Specify center point:4.25,18.5

Specify included angle:90

Q:Draw the floor plan of Classroom on board its' sides are (20,20ft),note that the figure faraway horizontality and 1ft vertically from original point (0,0).**Using Relative Coordinate System.**



Solve using Relative Coordinate System

Draw walls

Command: Line

Specify first point :3,1

Specify next Point :@13.5,0

Specify next Point :@0,18.5

Specify next Point :@-6.250,0

Specify next Point :@0,-0.25

Specify next Point :@6,0

Specify next Point :@0,-18

Specify next Point :@-13,0

Specify next Point :@0,18

Specify next Point :@4, 0

Specify next Point :@0,0.25

Specify next Point :@-4.25,0

Specify next Point :@0,-18.5

Draw left down table

Command: Rec

Specify first corner point:3.250,5.250

Specify other corner Point:@4,2

Draw right down table

Command: Rec

Specify first corner point:12.25,5.25

Specify other corner Point:@4,2

Draw left up table

Command: Rec

Specify first corner point:3.250,11.25

Specify other corner Point:@4,2

Draw right up table

Command: Rec

Specify first corner point:12.25,11.25

Specify other corner Point:@4,2

Draw left down chair

Command: Line

Specify first point :4.25,4.25

Specify next Point :@2,0

Command: arc

Specify first point of arc:4.25, 4.25

Specify second point of arc:5.25,3.25

Specify end point: 6.25, 4.25

Draw right down chair

Command: Line

Specify first point :13.25,4.25

Specify next Point :@2,0

Command: arc

Specify 1st point of arc:13.25,4.25

Specify center point of arc:14.25,4.25

Specify end point: 15.25,4.25

Draw left up chair

Command: Line

Specify first point :4.25,10.25

Specify next Point :@2,0

Command: arc

Specify 1st point:4.25,10.25

Specify center point:5.25,10.25

Specify included angle:180

Draw right up chair

Command: Line

Specify first point :13.25,10.25

Specify next Point :@2,0

Command: arc

Specify 1st point:13.25,10.25

Specify center point:14.25,10.25

Specify length of chord: 2

Draw board

Command: Rec

Specify first corner point:11.25,17.25

Specify other corner Point:@4,2

Draw window

Command: Line

Specify first point :11.25,19.25

Specify next Point :@0,0.25

Command: Line

Specify first point :15.25,19.25

Specify next Point :@0,0.25

Command: Line

Specify first point :11.25,19.25

Specify next Point :@4,0

Draw door

Command: Line

Specify first point :7.25,19.5

Specify next Point :@0,-3

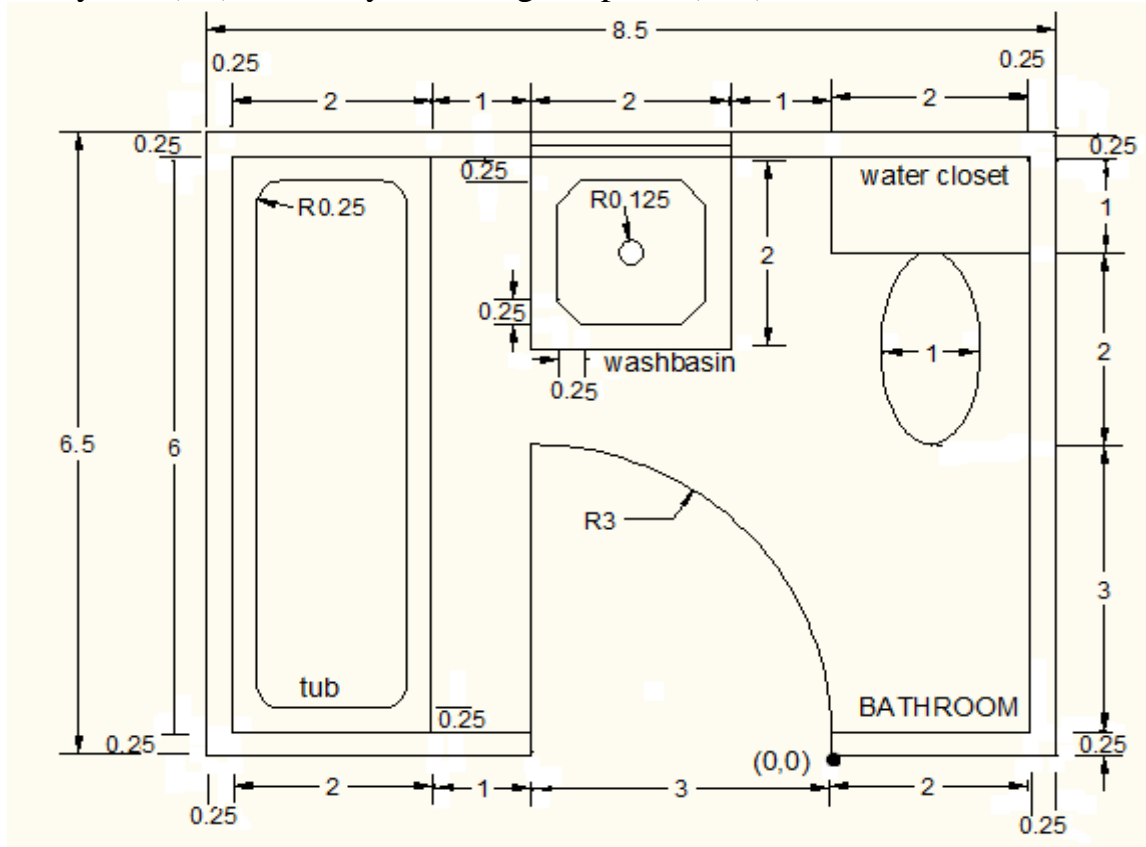
Command: arc

Specify 1st point:7.25,16.5

Specify center point:7.25,19.5

Specify included angle:90

Q: Draw the Bath floor plan on board its' sides are (12, 8ft), note that the figure faraway (1ft) horizontally and (1ft) vertically from original point (0, 0).



Solve using Relative Polar Coordinate System

Draw walls

Command: Line

Specify first Point :0,0

Specify next Point :@2.25<0

Specify next Point :@6.5<90

Specify next Point :@8.5<180

Specify next Point :@6.5<270

Specify next Point :@3.25<0

Specify next Point :@0.25<90

Specify next Point :@3<180

Specify next Point :@6<90

Specify next Point :@8<0

Specify next Point :@6<270

Specify next Point :@2<180

Specify next Point :@0.25<270 or C

Draw Tub

Command: Rec

Specify first corner point:-6,0.25

Specify other corner Point:@6.324<71.565

Command: Rec

Specify first corner point or []:F

Specify fillet radius for rectangles:0.25

Specify first corner point:-5.750,0.25

Specify other corner Point: @5.700<74.744

Draw Water closet

Command: Rec

Specify first corner point: 0,5.25

Specify other corner Point: @2.236<26.565

Command : ellipse

Specify axis end point of ellipse or []: 1,5.25

Specify other end point of axis: 1,3.25

Specify distance to other axis or [Rotation]: 0.5

Draw Washbasin

Command: Rec

Specify first corner point: -3,4.25

Specify other corner Point: @2.828<45

Command: Rectangle (enter)

Command: Chamfer

Specify first chamfer distance for rectangle : 0.25

Specify second chamfer distance for rectangle: 0.25

Specify first corner point: -2.750,4.5

Specify other cornerpoint: @2.121<45

Draw window

Command: Line

Specify first Point :-3,6.25

Specify next Point : @0.25<90

Command: Line

Specify first Point :-1,6.25

Specify next Point : @0.25<90

Command: Line

Specify first Point :-3,6.375

Specify next Point : @2<0

Draw door

Command: Line

Specify first point :-3,0.25

Specify next Point : @3<90

Command: arc

Specify 1st point: 0,0.25

Specify center point: -3,0.25

Specify included angle: 90

Solve using Relative Coordinate System

Draw walls

Command: Line

Specify first point :0,0

Specify next Point :@2.25,0

Specify next Point :@0,6.5

Specify next Point :@-8.5,0

Specify next Point :@0,-6.5

Specify next Point :@3.25,0

Specify next Point :@0,0.25

Specify next Point :@-3,0

Specify next Point :@0,6

Specify next Point :@8, 0

Specify next Point :@0,-6

Specify next Point :@-2.0

Specify next Point :@0,-0.25 or c

Draw tub

Command: Rec

Specify first corner point:-6,0.250

Specify other corner Point:@2,6

Command: Rec

Specify first corner point or []:F

Specify fillet radius for rectangles:0.25

Specify first corner point:-5.750,0.5

Specify other corner Point:@1.5,5.5

Draw water closet

Command: Rec

Specify first corner point:0,5.25

Specify other corner Point:@2,1

Command : ellipse

Specify axis end point of ellipse:1,5.25

Specify other end point of axis:1,3.25

Specify distance to other axis or :0.5

Draw wash basin

Command: Rec

Specify first corner point:-3,4.25

Specify other corner Point:@2,2

Command: Rec

Specify first corner point :C

Specify first chamfer distance for rectangles:0.25

Specify second chamfer distance for rectangles:0.25

Specify first corner point:-2.75,4.5

Specify other corner Point:@1.5,1.5

Command : C

Specify center point for circle:-2,5.25

Specify radius of circle:0.125

Draw window

Command: Line

Specify first point :-3,6.25

Specify next Point :@0,0.25

Command: Line

Specify first point :-1,6.25

Specify next Point :@0,0.25

Command: Line

Specify first point :-3,6.375

Specify next Point :@2,0

Draw door

Command: Line

Specify first point :-3,0.25

Specify next Point :@0,3

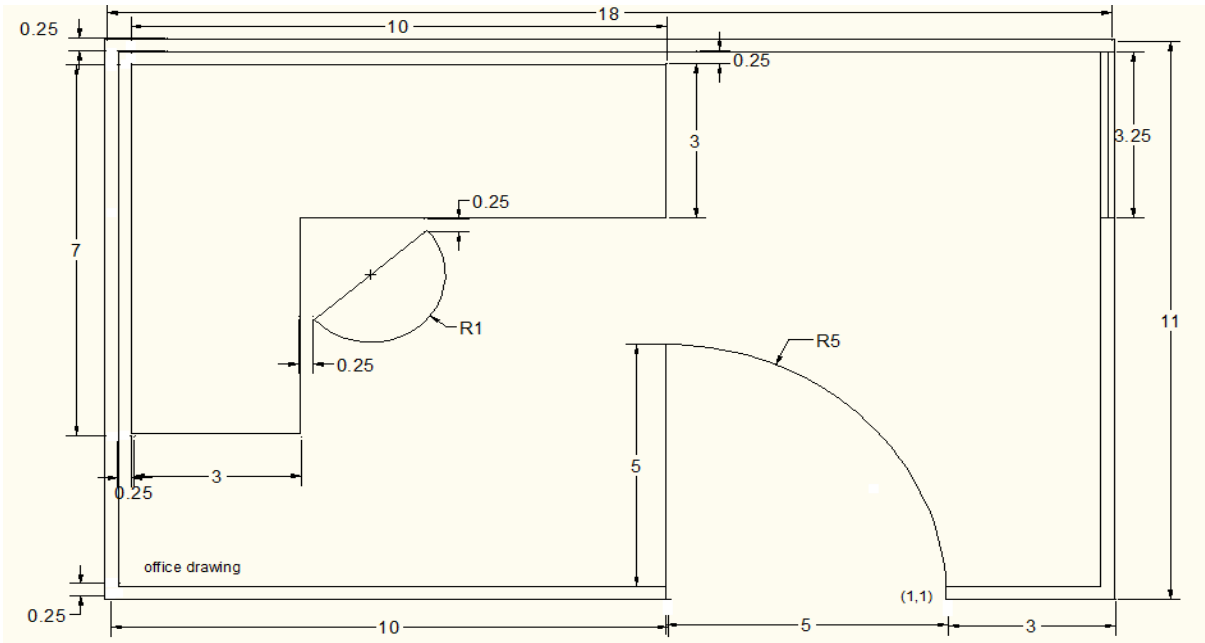
Command: arc

Specify 1st point:0,0.25

Specify center point:-3,0.25

Specify included angle:90

Q: Draw the office floor plan on board its' sides are (12,8ft), note that the figure faraway (1ft) horizontality and (1ft) vertically from original point (0,0). Using Absolute Coordinate System.



Solve using Absolute Coordinate System

Draw walls

- Command: Line
- Specify first Point :1,1
- Specify next Point :4,1
- Specify next Point :4,12
- Specify next Point :-14,12
- Specify next Point :-14,1
- Specify next Point :-4,1
- Specify next Point :-4,1.25
- Specify next Point :-13.750,1.25
- Specify next Point :-13.750,11.750
- Specify next Point :3.750,11.750
- Specify next Point :3.750,1.25
- Specify next Point :1,1.25
- Specify next Point :1,1 or c

Draw table

- Command: Line
- Specify first Point :-13.5,3.5
- Specify next Point :-10.5,3.5
- Specify next Point :-10.5,7.5
- Specify next Point :-4,7.5
- Specify next Point :-4,11.5
- Specify next Point :-13.5,11.5
- Specify next Point :-13.5,3.5 or c

Draw window

Command: Line

Specify first Point :3.750,8.5

Specify next Point :4,8.5

Command: Line

Specify first Point :3.750,11.750

Specify next Point :4,11.750

Command: Line

Specify first Point :3.875,8.5

Specify next Point :3.875,11.750

Draw door

Command: Line

Specify first point :-4,1.25

Specify next Point :-4,6.25

Command: arc

Specify 1st point:1,1.25

Specify center point:-4,1.25

Specify included angle:90

Draw chair

Command: Line

Specify first point :-10.25,5.5

Specify next Point :-8.25,7.25

Command: arc

Specify 1st point:-10.25,5.5

Specify center point:-9.25,6.5

Specify included angle:180

Q. What is the expected result from execute following commands in AutoCAD Program?

Command: rectangle
Command: fillet
Specify radius of fillet: 0.1
Specify first corner point:0,0
Specify other corner point: @1,1

Command:Rectangle (enter)
Specify first corner point: 0.250,0.250
Specify other cornerpoint:@0.5,0.5

Command:Rectangle (enter)
Specify first corner point: 0.250, - 0.5
Specify other cornerpoint:@0.5,0.5

Command:Rectangle (enter)
Specify first corner point: 1,0.250
Specify other cornerpoint:@0.5,0.5

Command:Rectangle (enter)
Specify first corner point: 0.250,1
Specify other cornerpoint:@0.5,0.5

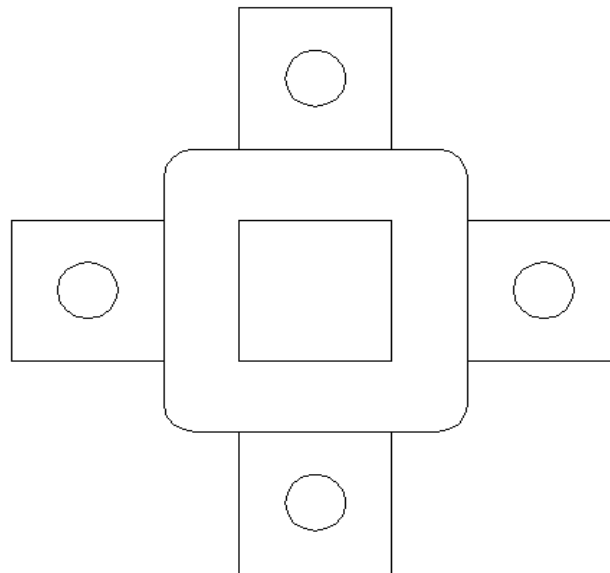
Command:Rectangle (enter)
Specify first corner point: -0.5,0.250
Specify other cornerpoint:@0.5,0.5

Command :Circle
Specify the center Point: 0.5,-0.250
Specify the radius:0.1

Command :Circle
Specify the center Point: 1.250,0.5
Specify the radius:0.1

Command :Circle
Specify the center Point: 0.5,1.250
Specify the radius:0.1

Command :Circle
Specify the center Point:- 0.250,0.5
Specify the radius:0.1



Q-What is the expected result from execute following commands in AutoCAD Program?

Command:Rectangle (enter)
Specify first corner point: 5,3
Specify other cornerpoint:@5,5

Command:Line (enter)
Specify first point :7.5,3
Specify next Point :@2.5,2.5
:@-2.5,2.5
:@-2.5,2.5
:@-2.5,-2.5
:@2.5,-2.5

Command:Line (enter)
Specify first point :5,3
Specify next Point :@1.250,1.250

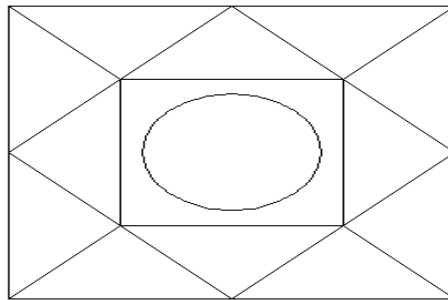
Command:Line (enter)
Specify first point :10,3
Specify next Point :@-1.250,1.250

Command:Line (enter)
Specify first point :10,8
Specify next Point :@-1.250,-1.250

Command:Line (enter)
Specify first point :5,8
Specify next Point :@1.250,-1.250

Command:Rectangle (enter)
Specify first corner point:
6.250,4.250
Specify other cornerpoint:@2.5,2.5

Command :Circle
Specify the center Point:7.5,5.5
Specify the radius:1



Q: What is the expected result from execute following commands in AutoCAD Program?

Command:Rectangle
Specify first corner point: 0,0
Specify other cornerpoint:@90,70

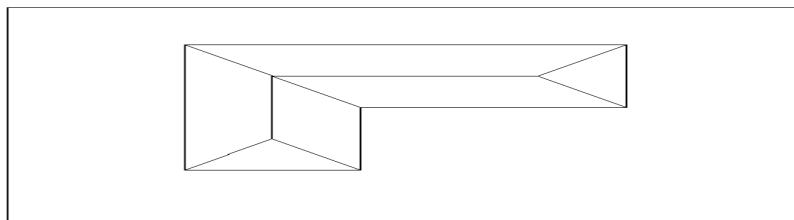
Command: Line
Specify first Point :20,18
Specify next Point :@ 20,0
:@0,20
:@30,0
:@0,20
:@-50,0
:Close

Command: Line
Specify first Point:20,18
Specify next Point:@ 10,10
:@10,-10

Command: Line
Specify first Point:70,38
Specify next Specify:@ -10,10
:@10,10

Command: Line
Specify first Point:30,28
Specify next Point:@ 0, 20
:@30,0

Command: Line
Specify first Point:40,38
Specify next Point:@-20,20



Q-What is the expected result from execute following commands in AutoCAD Program?

Command: Line

Specify first Point :2,2

Specify next Point :@ 2,-2

:@2,2

:@2,-2

:@2,2

:@-2,2

:@2,2

:@-2,2

:@-2,-2

:@-2,2

:@-2,-2

:@2,-2

:Close

Command: arc

Specify 1st point of arc:2,2

Specify center point:3,1

Specify end point: 4,0

Command: arc

Specify 1st point of arc:8,0

Specify center point:9,1

Specify end point: 10,2

Command: arc

Specify 1st point arc:10,6

Specify center point:9,7

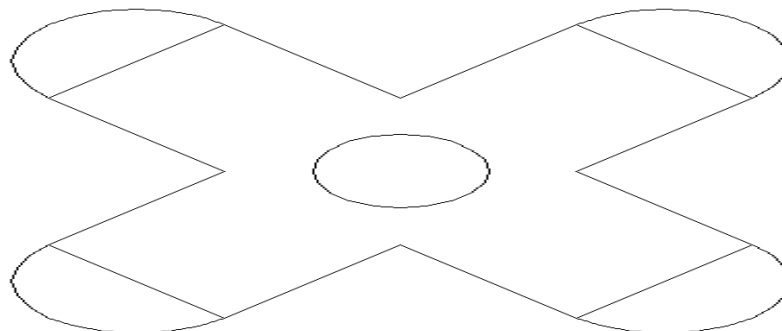
Specify end point: 8,8

Command: arc

Specify 1st point of arc:4,8

Specify center point:3,7

Specify end point: 2,6



Q: what is the result expected from executing the following Program on AutoCAD application.

Command :Line
Specify First Point: 100,100
Specify Next Point:100,0
Key board: Esc

Command :Line
Specify First Point: 0,100
Specify Next Point:@100,0
 :**@-100,-100**
 :**@100,0**
 :**@-100,100**
 :**@0,-100**

Key board: Esc

Command :Line
Specify First Point: 25,50
Specify Next Point:@35.355<45
 :**@35.355<315**
 :**@ 35.355<225**
 :**@35.355<135**

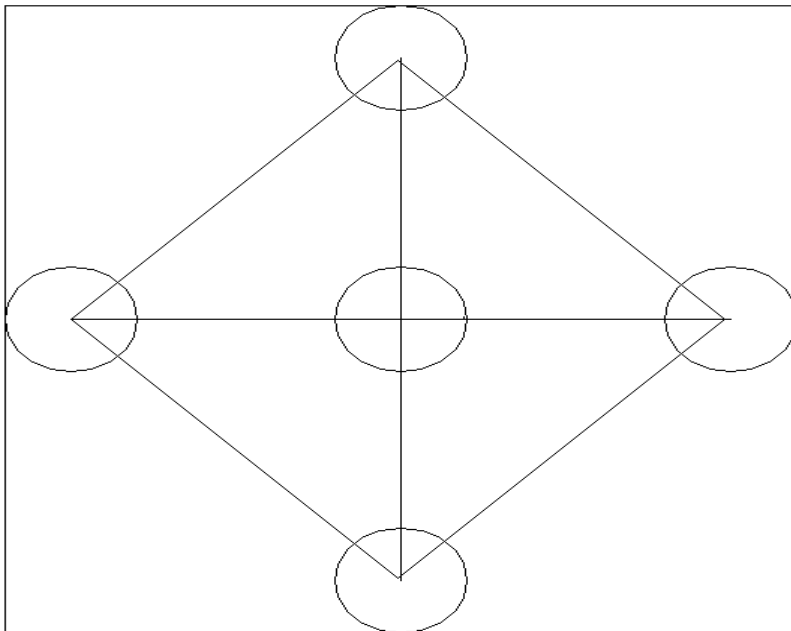
Key board: Esc

Command :Circle
Specify the center Point: 25,50
Specify the radius:10
Key board: Esc

Command :Circle
Specify the center Point: 50,25
Specify the radius:10
Key board: Esc

Command :Circle
Specify the center Point:75, 50
Specify the radius:10
Key board: Esc

Command :Circle
Specify the center Point: 50,75
Specify the radius:10



Q: what is the result expected from executing the following Program on AutoCAD application.

Command: Line
Specify first Point:0,0
Specify next Point:@100,0
 :@0,50
 :@ -25,0
 :@0,100
 :@ -50,0
 :@0, -100
 :@ -25,0
 :@0, -50
 :Close

Command: Line
Specify first Point:0,40
Specify next Point:@100,0
 :Close

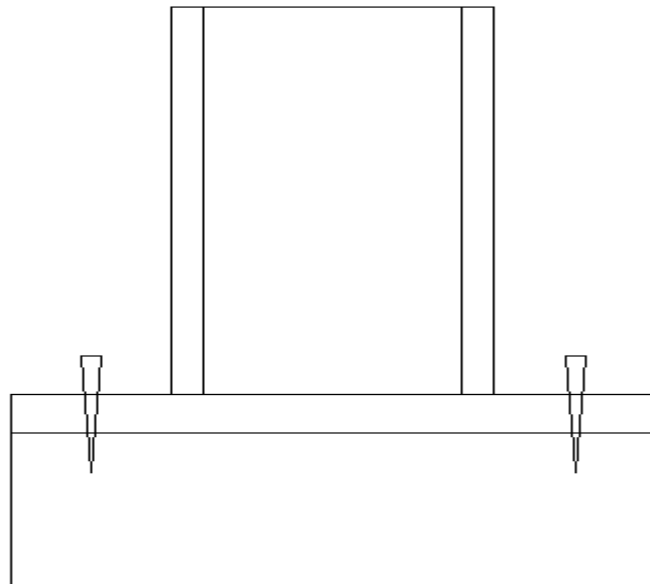
Command: Line
Specify first Point:25,50
Specify next Point:@50,0
 :Close

Command: Line
Specify first Point:30,150
Specify next Point:@0, -100
 :Close

Command: Line
Specify first Point:70,150
Specify next Point:@0, -100
 :Close

Command: Line
Specify first Point:11,60
Specify next Point:@3,0
 :@ -1.5, -30
 :@ -1.5,30
 :Close

Command: Line
Specify first Point:89,60
Specify next Point:@ -3,0
 :@1.5, -30
 :@1.5,30
 :Close



Q: what is the result expected from executing the following Program on AutoCAD application.

Command: Line
Specify first Point:0, 0
Specify next Point:@ 0,-500
 :**@300,0**
 :**@0,350**
 :**@2400,1200**
 :**@0,200**
 :**Close**

Command: Line
Specify first Point:0,0
Specify next Point:@ 300,0
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**@0,200**
 :**@300,0**
 :**Close**

Command:Rectangle (enter)
Specify first corner point: 40,-40
Specify other cornerpoint:260,-460

Command:Rectangle (enter)
Specify first corner point: 50,-50
Specify other cornerpoint:250,-450

Command :Circle
Specify the center Point: 60,-60
Specify the radius:10

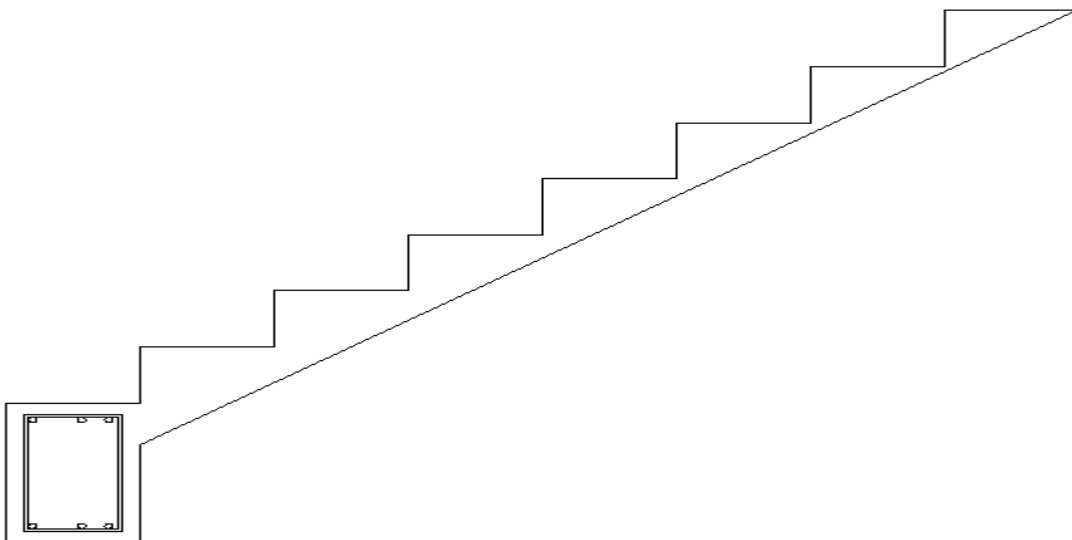
Command :Circle
Specify the center Point: 170,-60
Specify the radius:10

Command :Circle
Specify the center Point: 230,-60
Specify the radius:10

Command :Circle
Specify the center Point: 60,-440
Specify the radius:10

Command :Circle
Specify the center Point: 170,-440
Specify the radius:10

Command :Circle
Specify the center Point: 230,-440
Specify the radius:10



Q-What is the expected result from execute following commands in AutoCAD Program? (Put all the necessary coordinates on the resulting shape).

Command: Line (enter)
Specify first point: 0, 0
Specify next point: @12<0
Specify next point: @2<90
Specify next point: @12<0
Specify next point: @2<270
Specify next point: @12<0
Specify next point: @6<90
Specify next point: @6<180
Specify next point: @6<90
Specify next point: @6<0
Specify next point: @6<90
Specify next point: @12<180
Specify next point: @2<270
Specify next point: @12<180
Specify next point: @2<90
Specify next point: @12<180
Specify next point: @6<270
Specify next point: @6<0

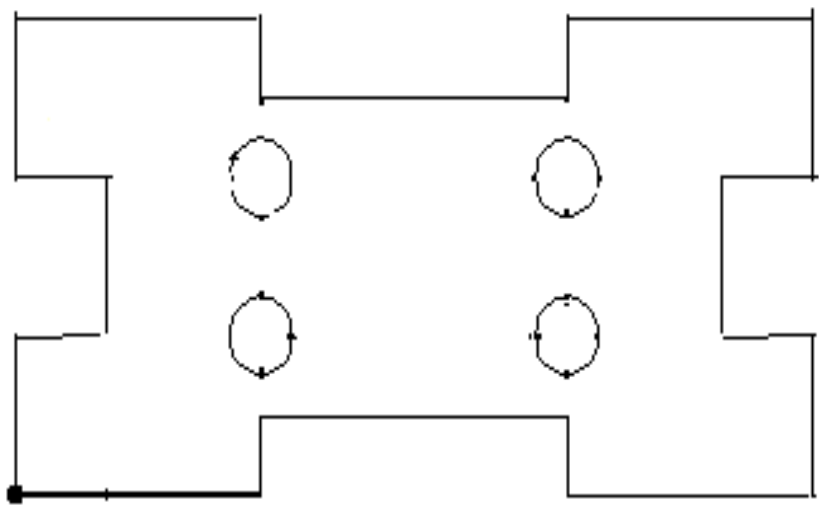
Specify next point: @6<270
Specify next point: @6<180
Specify next point: @6<270

Command: Circle (enter)
Specify center point of circle: 12, 6
Specify radius of circle: 2

Command: Circle (enter)
Specify center point of circle: 24, 6
Specify radius of circle: 2

Command: Circle (enter)
Specify center point of circle: 12, 12
Specify radius of circle: 2

Command: Circle (enter)
Specify center point of circle: 24, 12
Specify radius of circle: 2



Q: what is the expected result from execute following code on AutoCAD Program?

Command:Rectangle (enter)
Specify first corner point: 0,0
Specify other cornerpoint:@4,0.5

Command:Rectangle (enter)
Specify first corner point: 0,0.5
Specify other cornerpoint:@4,0.75

Command: Line
Specify first Point:1, 3.5
Specify next Point:@ 0,-1.750
Specify next Point:@ 2,0
Specify next Point:@ 0,1.750

Command: Line
Specify first Point:0, 1.250
Specify next Point:@ 0,2.250

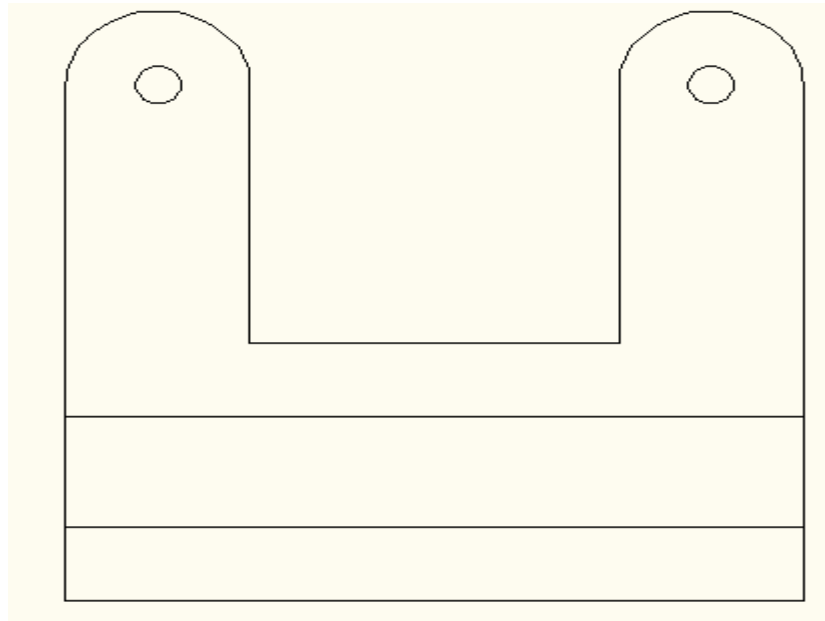
Command: Line
Specify first Point:4, 1.250
Specify next Point:@ 0,2.250

Command: arc
Specify first poin:0,3.5
Specify second point:0.5,4
Specify end point: 1,3.5

Command: arc
Specify first poin:4,3.5
Specify second point:3.5,4
Specify end point: 3,3.5

Command : C
Specify center point for circle:0.5,3.5
Specify radius of circle:0.125

Command : C
Specify center point for circle:3.5,3.5
Specify radius of circle:0.125



Q: what is the expected result from execute following code on AutoCAD Program?

Command: Rec
Specify first corner point:0,0
Specify other corner Point:@4,4

Command: Rec
Specify first corner point:0,4
Specify other corner Point:@4,1

Command : C
Specify center point for circle:0.5,0.5
Specify radius of circle:0.250

Command : C
Specify center point for circle:3.5,0.5
Specify radius of circle:0.250

Command : C
Specify center point for circle:0.5,3.5
Specify radius of circle:0.250

Command : C
Specify center point for circle:3.5,3.5
Specify radius of circle:0.250

Command: Line
Specify first point :0,5
Specify next Point :@4,0
Specify next Point:@0,1
Specify next Point:@-1.5,0
Specify next Point :@0,12
Specify next Point:@1.5,0
Specify next Point:@0,1
Specify next Point:@-4,0
Specify next Point:@0,-1
Specify next Point:@1.5,0
Specify next Point:@0,-12
Specify next Point:@-1.5,0
Specify next Point:@0,-1

