AutoCAD 2010

1. Open AutoCAD 2010→ double click on its icon on desktop..

2. At [A] > new > drawing > a cad , then you must ensure that the workspace is 2D drafting and annotation is displayed..

3. Units ↵, make sure that type of length is decimal with two degree of precision i.e 0.00 with mm units. > ok .

4. Limits > 0,0 ↵ and 100,100 ↵ ..

5. Grid ← 10 ↵ to put grid of 10,10 ..

6. Snap ← 10 ↵ to put snap 0.1 ..

7. Z ↵ , A ↵ to show all drawing objects on screen ..

8. On draw panal choice Arc  or type Arc on command line . the choices is clearly defined on its icon  on draw panal the choices is draw Arc whith 3point , start center end ,start center angle ,see all options

A . for choice one click on 3-point
10,10 ↵ 20,30 ↵, 70,70↵←

B . start, center , end
40,40 ↵ , 40,10 ↵, 10,10
Note that the arc will be drawn anti-clockwise

C . start , end , radius
40,40 ↵ 40,80 ↵ 20 ↵

H . continue to draw an arcs.

AutoCAD 2010

9- circle

Click the icon  on the draw panel six choices is existing:-

A- Center , radius

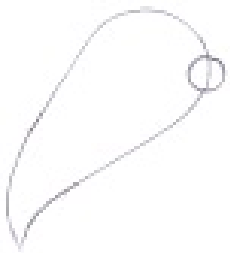
50,50 ↵ , 60 ↵

Don't forget Z ↵ ,A ↵

B- 2-point

If you know a 2 point on the perimeter of a circle then

65,50



50,50

C- 3-point if you know 3 point on the circle perimeter.

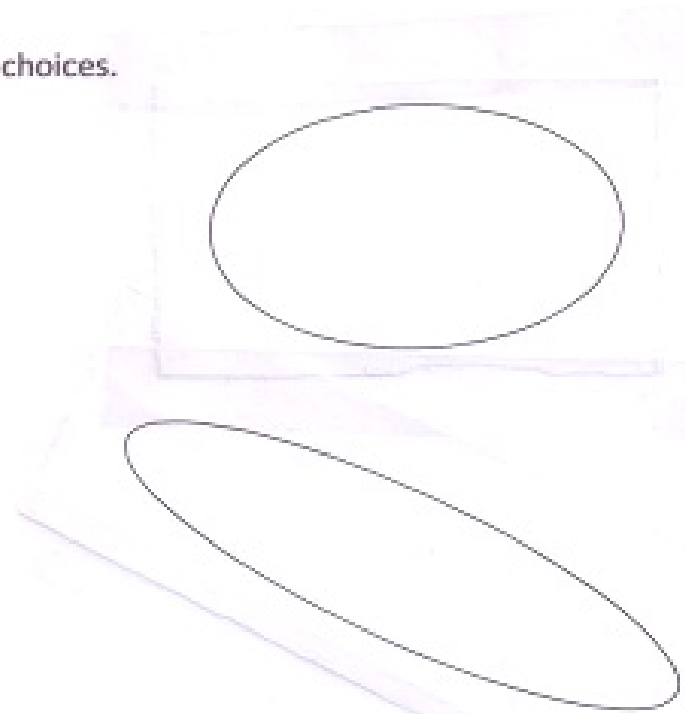
D- Tan,tan , radius

E- Tan,tan,tan

If you know 3 tangents of a circle.

10- ellipse:-

To draw ellipse you have 3 choices.



A- Center

40,40 ↵

70,10 ↵

10 ↵

B- axis , end

60,80 ↵

110,50 ↵

10 ↵

C- Elliptical arc .

you can draw ellipse with one of the two method and finally in this type of order you can specify stort point in the ellipse drawing and the end point (the path is anti clockwise).

11- spline

Creates smooth curves that pass through or near specified point , press [~] on draw panel .

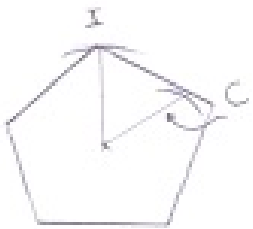
10,10 ↵ , 50,50 ↵ , 60,30 ↵

You can change shape of curve by controlling direction of tangents .

12- polygon

creates an equilateral closed polyline press  on draw panel .
Then you will be asked on number of sides (say 6) ↵

You also be asked then about the center of the polygon say 50, 50 ↵



I- Distance to vertex of polygon

c- Distance to the tangent

You will be asked about its radius 30 ↵ .

Hints:-

You can resize an object by using scale order (in modify panel) it is shown like  click on it or type scale on command line.

Then you will be asked on the base point on which the process will be done. Select the center and move the mouse slowly to show the possibilities you can either enlarge the polygon by choosing number > 1 or reducing its size by choosing number < 1 say 0.5 ↵ .

If you want to keep the original drawing choose C ↵ before you enter the number.

B- Construction line

creates a line of infinity length its icon is  or type xline on command line.

It can be used as reference line .Two point will be enough to specify its path, it can be horizontal , vertical , angle , etc ..... .

14- Ray. 

Creates a line that starts at point and continue to infinity it can be used as reference to draw another objects. You can just specify any point in the drawing and click or enter any other point .

Press ESC if you want to exit.

Hint:-

Don't forget Ctrl + Z go one step backward (undo).

Ctrl + Y go on step forward (redo).

Ctrl + A select all objects in drawing.

Ctrl + X delete them all.

Ctrl + S to save the drawing.

15- point:-

Go to utilities panel > point style > choose 

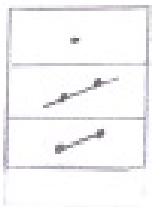
Its size is 5% and set relative to screen click any three points on the working space; this points used as reference to any objects or drawing

A- Also you can divide the length or perimeters to and equal distance draw any line on working space.
Draw > divided > 4> ↵

B- You can also use this topic to divide the length to specified segments.

Draw > line

Draw > click on arrow you will see



Multiple points

Divide

Measure

Select measure:-

Select line to measure

Specify length of segment say 10 ; if length is 100.

Then the line will be signed by points the distance between them is 10 units.

16- cloud

create a revision cloud using poly line. It is usually using to high light parts or draw an attention to it.

17- Poly line

It is connected sequence of segments created as single planar object,Press or write pline on command line

10,10 ↵ , 50,50 ↵ , A ↵ ,R ↵

20 ↵ , A ↵, 180 ↵ , direction

Cord is 90 ↵ , L ↵, 20,50 ↵, E ↵

Or:- 10,10 ↵, 50,10 ↵ , A ↵, CE ↵, 50,30 ↵, 50,50 ↵, L ↵

20,50 , c ↵

AutoCAD 2010

1- From quick access toolbar click on down arrow > show menu bar then many short cut order will appear to help you in quick access to many facilities in program

2- Format > unit > precision > ok
0.00

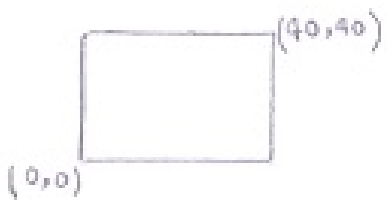
Insertion\codamm >

3- Format > drawing limits > 0,0 ↵ , 100,100 ↵

4- Grid > 10 , snap >0.1 ↵

5- From draw panel choose rectangle , when create rectangle poly line

0,0 ↵ , 40,40 ↵



Don't forget Z ↵ , A ↵

6- It is an object having 4 connected sides to explode these side(i.e .deal with them separately)
Click on the rectangle then go to explode to reconnect them as region then in draw panel go to region and select all rectangle by mouse then , the region order let you deal with a close region .and you can get its geometircal proparties by order mass prop .

In draw panel pick the object then ↵ a window contains many geometrical properties will get by exploding the rectangle you can erase aside or two and so on.

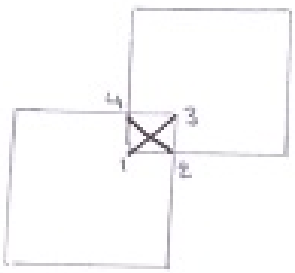
Pick any side and delete it after exploding the rectangle.

7- Draw a circle having center of 20,20 with radius 20 inside a rectangle having two end at 0,0 and 40,40 .

8- Select them all by mouse.

9- Click copy in modify panel 
Select base point as 20,20 ↵
Select 2nd point as 45,45 ↵
Or you can choose displacement such that the entered distance will take the direction of your mouse.

10- You can make a mask on a closed region using
Draw >  >



Note:-
Rectangle coordinate 0,0 , 30,30
Circle center 15,15
Radius is 15
Copy the original to 15,15 ↵

Choose 1,2,3,4 then ↵ , a mask of current screen color will cover the select region .

Also you can redraw frame by

Draw > wipe out > F > on

The difference between frames on 0 , of is that when frame on the frame will appear on drawing not like frame off.

To erase the mask select it by mouse then Ctrl + x .

11- You can color an enclosed area with gradient full

Draw > Gradient > one color > Or two choose any > select the of the six options centered > region say or not with angle 0-3,5 > upper circle Add click by mouse

12- To redo the process writ u on command line.

13- To mark an area as region make it first by boundary order.

Draw > boundary pick the upper circle center or area around ↵

14- Draw > region >pick the selection area which defined in the previous step then ↵

Write mass prop ↵ then select the above region its geometrical information will be displeased in new text window.

15- To rotate an object . 

Modify > rotate > select object > such as > specify base point by mouse down choose 0,0 Rectangle

>If you want to rotate the object only > then write the angle says -45 ←

if you want to keep the original object then before you enter the angle write enter then put the angle of rotation .

16- Mirror 

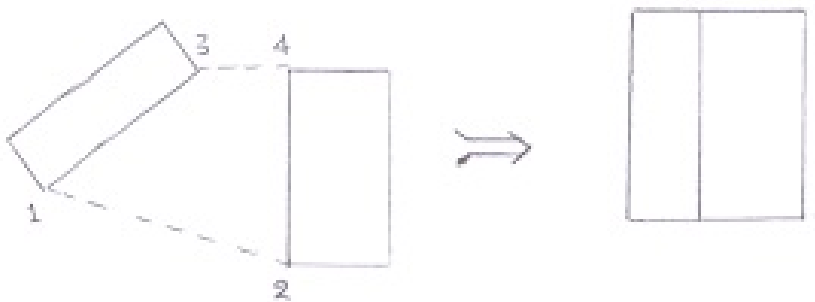
If you want to make a such like mirror pick in modify >select object

Pick all the drawing by mouse ↵

Specify them the location of mirror by mouse or absolute or relative coordinate, you will be asked if you want to keep the original objects or not.

17- Align

Aligns objects with other object in 2D,3D



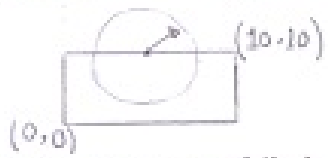
Modify > align 

Select the object you want to move you can use 1,2 or 3 points

Pick source point 1 pick 2 then the result is

18- union , intersect , subtract

Draw rectangle with 0,0 and 10,10 also draw a circle with radius of 2.5 and in the center of upper line of rectangle



Copy the object two times while keeping the original drawing in the same level. Convert circles of rectangles to region by select region in draw panel ↵ and regions all.

- In command line write union ↵, select the circle and rectangle and ← then the command lines will be deleted . and the object will be as shown

- In command line write intersect ↵, select circle and rectangle then only the command region will appear .

- In command line write subtract ↵ , select the circle firstly then ↵, select the rectangle then ↵ only a part of a circle that its region which is common with rectangle is deleted . i.e →

- If you choose the rectangle first ↵ and then select the circle the result appear as shown

This means that the first object is the region from which you subtract an area or region and the second is the deleted area or region .

19- Break

A- Choose any line , choose point either by mouse or absolute coordinate also choose the second point by same method.

1-

2-

3-

This will delete a certain portion of a line bounded by the two point this method can be applied to any continuous path such as circle , spline , arc ....

B- Break a point

Choose any draw line pick a point at which you want to break , test the result by click the object

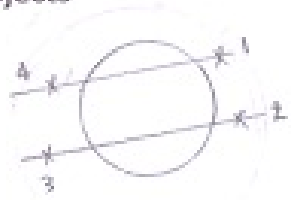
- You can use order join in command line or
  To rejoin the breaked line .
  Test the result by click the intended object .

20- Trim

Trim object to meet the edges of other objects

Draw

Trim ↵



Select the circle ↵

Select 1,2,3,4 by click the then the result is

21-Extend

You extend a line predefined boundary

Draw

extend↵

click on 1,2,3,4 the result is

22-Fillet

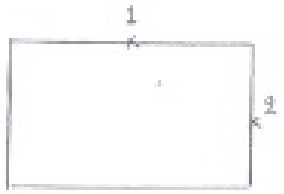
Rounds and fillet the edge of objects .

Draw rectangle with corner

0,0 and 30,30 ↵

Fillet ↵ or press  icon in modify panel

R ↵, 5 ↵, explode the rectangle and select 1,2 by click while the mouse is 1,2



The result is as shown

You can do the same procedure to other corner .

AutoCAD 2010

23- Hatch

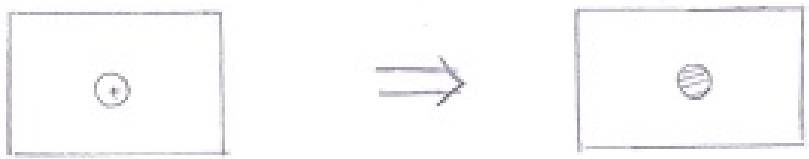
Fills an enclosed area or selected object with a hatch pattern or fill.

Press  icon in draw panel or write hatch in command line

In hatch panel choose user defined

Angle 45

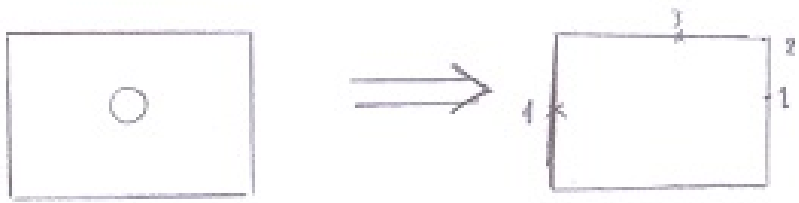
In boundaries choose pick points in the intended area



If you want to hatch all the region bounded by a line or spline or arc

Select them in a closer region .

In the procedure above choose select object instead of add pick points used above .



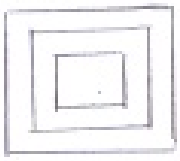
The result

Assume the angle 45
And a proper distance between lines .

24) Offset 

You can offset an objects at a specified distance or throw appoint

Draw rectangle 0,0 and 20,20 , click on offset  in modify panel or write offset in command line, you will be asked about the distance through which the object is offset write 3↵, select the object above and click inside the rectangle ,repeat the order by ↵ ,staying the same distance and click outside the rectangle the final shapes are as shown .>>>>



25) Hatch edit

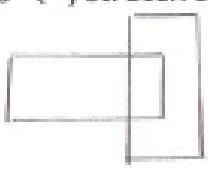
If you already hatched zone and you want to modify its properties , you can rehatch any hatching zone by click on , on modify panel or write hatch edit on command line, ↵ .....

Suppose the outer shape of the rectangle drawn in the previous step with user defined type angle 45, spacing 3 mm and you want to change the distance between lines to 7 mm and modify >hatch edit >select the hatching zone > spacing > ok . then the distance will be change..

26) Stretch

In this order you can stretch the objects crossed by a selection window , objects are partially enclosed by a crossing window .or that arc selected individually , are moved rather than stretched .

Draw rectangle 30,20 ↵, 70, 40 ↵, stretch select the front front part of rectangle .



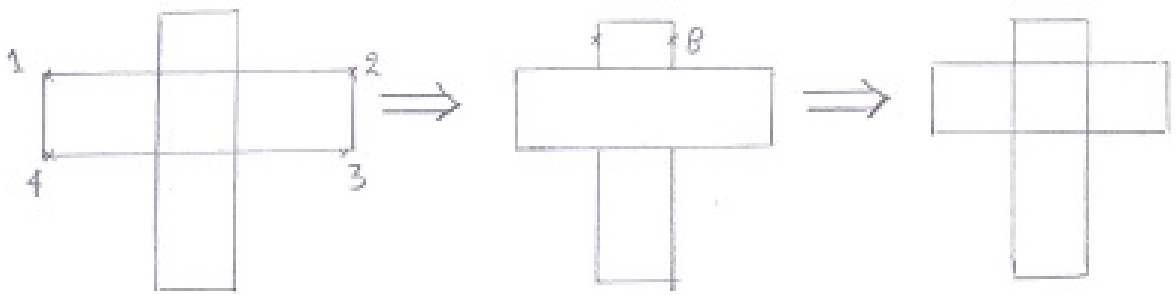
Crossing window ← , specify base point, select the lower left corner of the rectangle and move toward any direction by mouse say toward ∞-axis and click

27) Draw order

Forces selected objects to be displayed in front of all other objects.

In front of all other object

Draw two rectangle



Make amask then pick in modify panel

>>Select points on the other objects >> this will bring the vertical

Rectangle to the front even there is a mask on the horizontal rectangle in the option of this order you can not only bring the object to front but also you can send to back so on ...

Isometric drawing

The isometric snap / grid mode helps you to create 2D isometric images that represent 3D objects, by setting the isometric snap/ grid; you can easily align objects along one of three isometric planes.

- In states bar > grid display > setting > snap and grid > snap type› isometric snap> OK
- also in the same window set grid spacing to 10 , snap spacing to 0.1 > remove adaptive grid > OK
- In states bar > grid display > setting > polar tracking> put polar tracking on> set increment angle to 30^0 > OK
- As before select units and drawing limits decimal and 0.00 precision with mm units. Set drawing limits to 0,0 and 200, 200 for attached drawing highlights snap mode on and grid display also then press z ,press Enter key A, press Enter key to show all drawing limits on screen . Now you are ready to draw an isometric drawing following angles 30, 90, 150 in its two directions (i.e. forward & backward).
- Try to draw the drawing on right side, you may draw a box contains the drawing above and remove the unwanted zones.
- Use F5 the control the drawing plane.
- To draw a circle in isometric planes select the proper side that you will draw it in draw panel > axis and end > I > spacing the center and radius of the circle that will be changed to ellipse in isometric drawing, follow these instructions may help you to complete the drawing.
- In dimension order> specify the distance that you want to put the dimension on it by aligned> oblique to align the dimension in the right plane.