AUTODESK
AUTOCAD

CAD Lab

Lecture # 02

AUTODESK AUTOCAD

By: Engr Asim Ahmad Riaz

Ph.D. in Mechanical Engineering (in Progress)

B.Sc Mechanical Engineering

M.Sc in Material Engineering

Dept. of Mechanical Engineering

University of Engineering & Technology Peshawar

Setting Up Drawing Sheet & Status Bar.

Learning Objectives of this Lecture

Students get to know about the following;

- Opening, Saving & New Drawing Sheet.
- Convert 3D workspace to 2D (if it is not set by default)
- UCS icon in 2D
- Set Units & Drawing limits
- Set Dimension & Text Style
- Command Prompt window & Repetition of commands
- Status bar or Status Toggle which include;

  Snap, Grid, Ortho, Polar, Osnap, Otrack, Dyn

- AutoCad Coordinate system

  Absolute, Relative & Polar Coordinate System

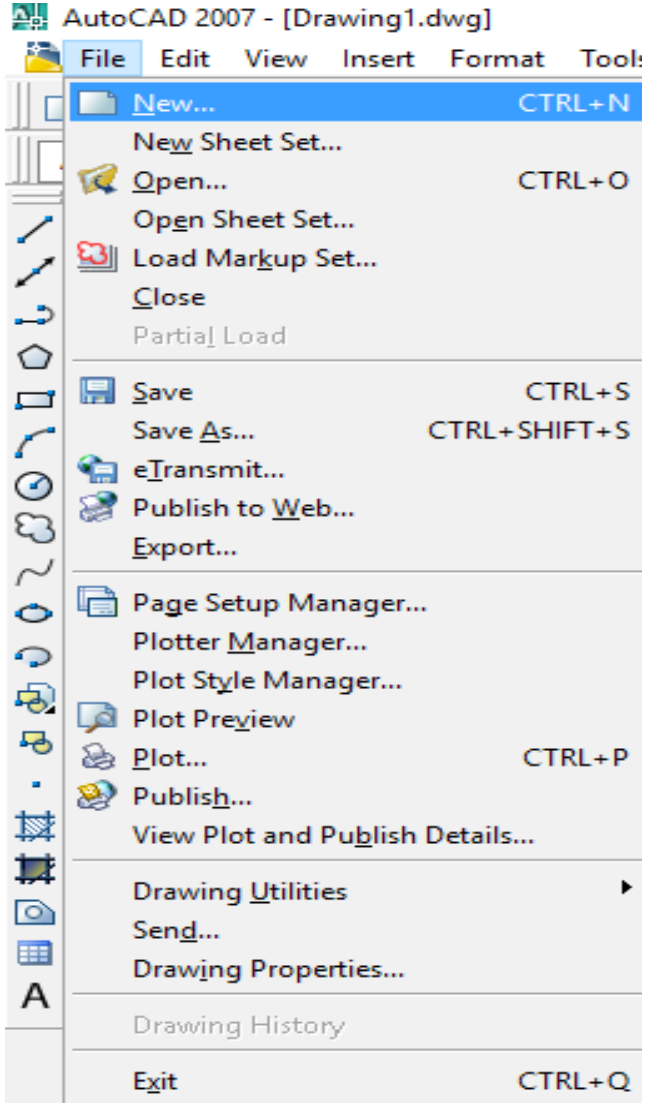
- Blue grip & size(stretch, lengthen)
- cross hair & pick box + Size
- Selection Window (From Right to Left & Left to Right)

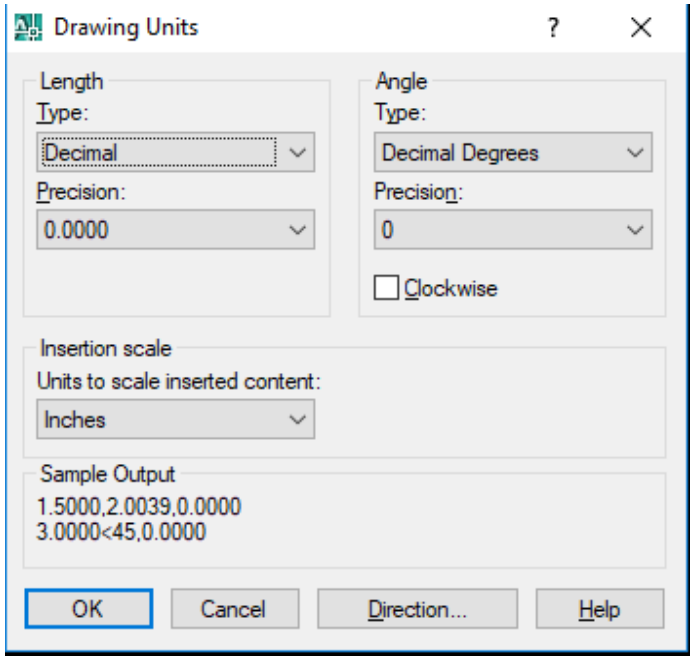
1. Setting New Sheet:

Ctrl+N or File Menu 

2. Setting Drawing Units:

Typing ‘un’ in command prompt area and then pressing enter. A dialog box appears where units can be selected.





3. Setting Drawing Limits:

For example to set the screen for A3 size (420x297),

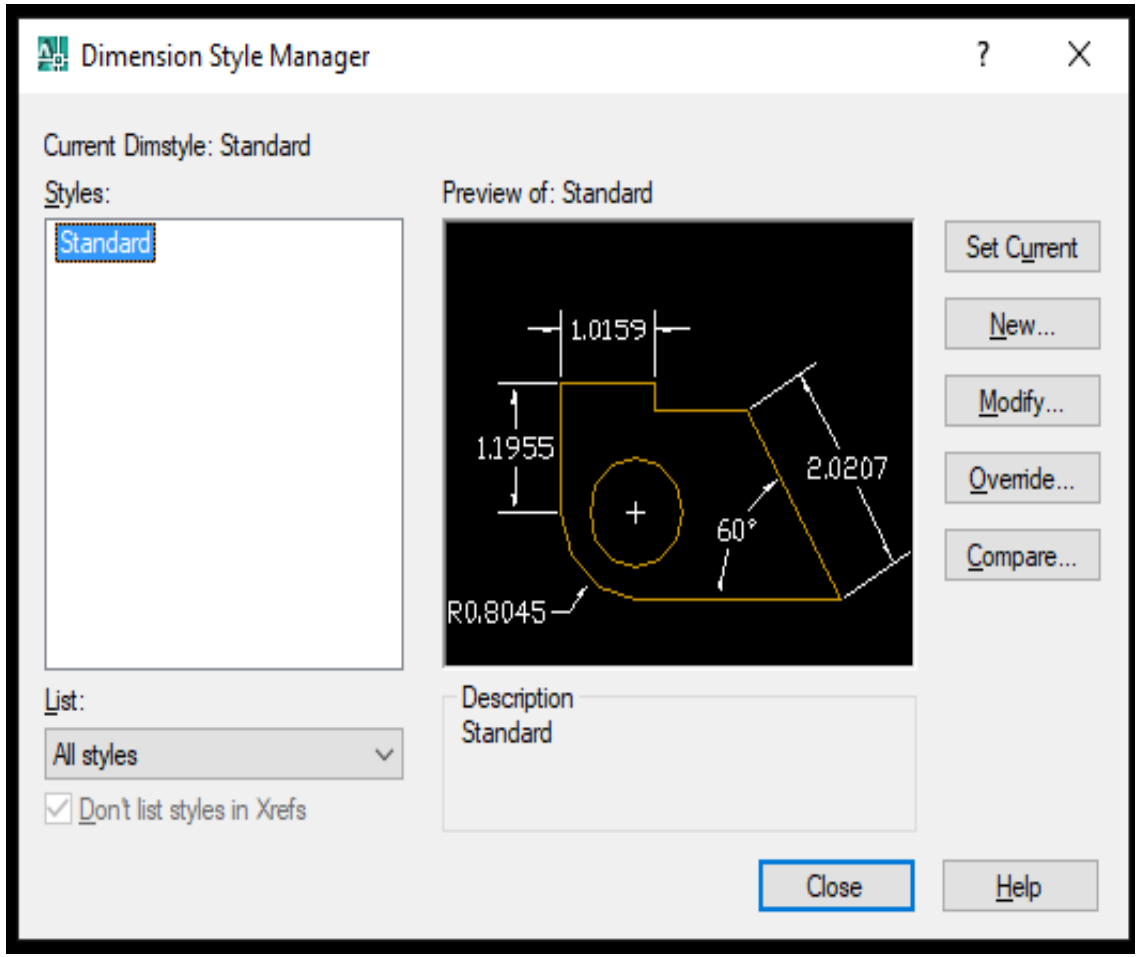
Following steps are to be carried out:

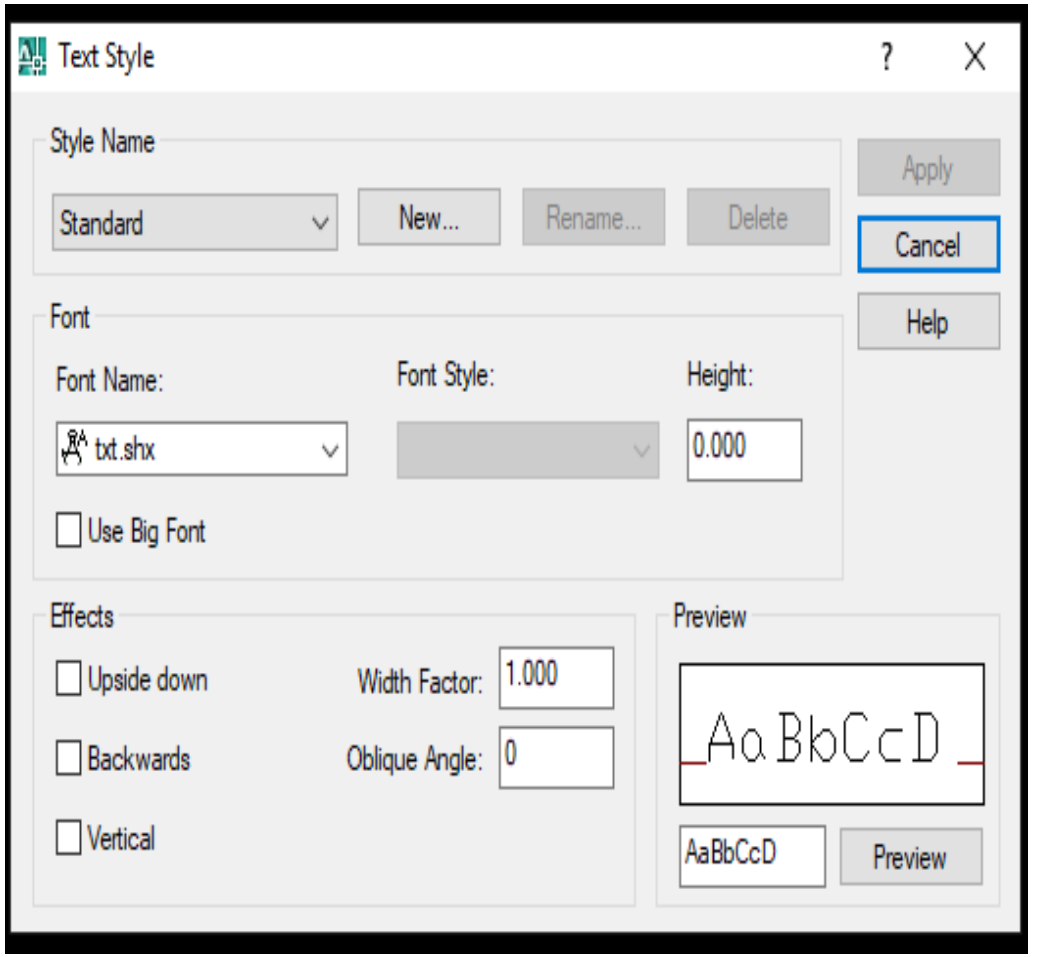
- Command: limits **[Enter]**
- ON/OFF/ lower left corner 0.000, 0.000 or current :[Enter]
- Upper right corner 12.000, 9.000 : 420,297 [Enter]

This will set the drawing screen of A3 size.

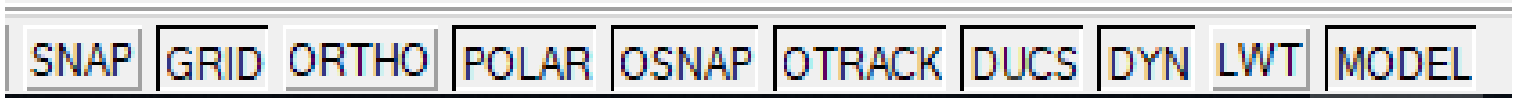
Don’t forget to apply ‘Zoom All’ command after setting drawing Limit & units

3. Setting Dimension Style (d) & Text Style (ST) :





Status Bar Options:



SNAP (F9)

Increment Snap controls the movement of the cursor. If it is off the cursor will move smoothly. If it is ON, the cursor will jump in an incremental movement. The increment spacing can be changed, at any time using TOOLS/DRAFTING SETTINGS. The default spacing is 0.250

It restricts cursor movement to specified intervals.

Command: snap

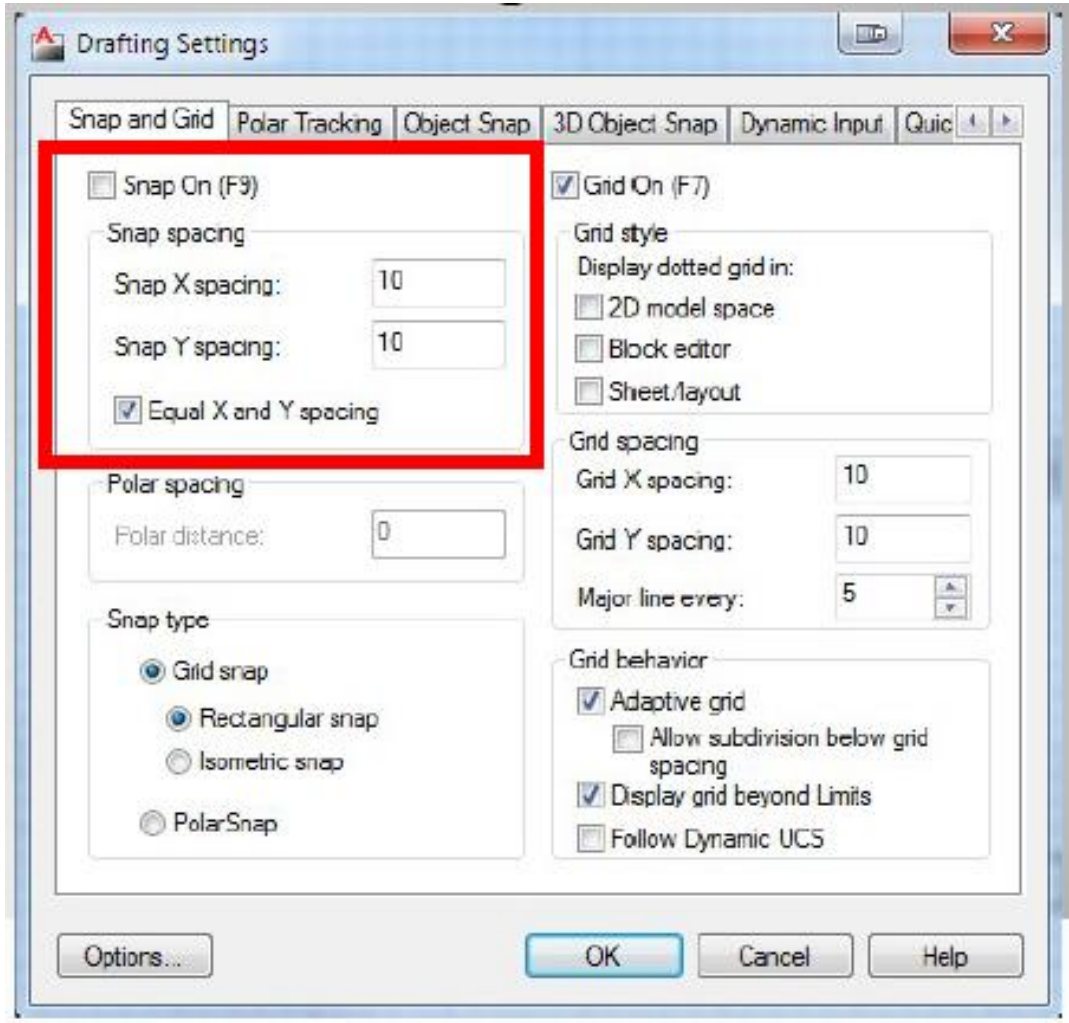
specify a distance, enter an option or press enter.

Spacing- Activates snap mode with the value you specify.

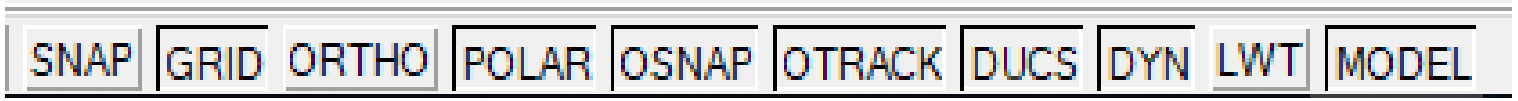
Rotate- Sets the rotation of the snap grid.

Style- format of the snap grid, standard or isometric.

It basically helps to draw the object in its required position



Status Bar Options:



GRID (F7)

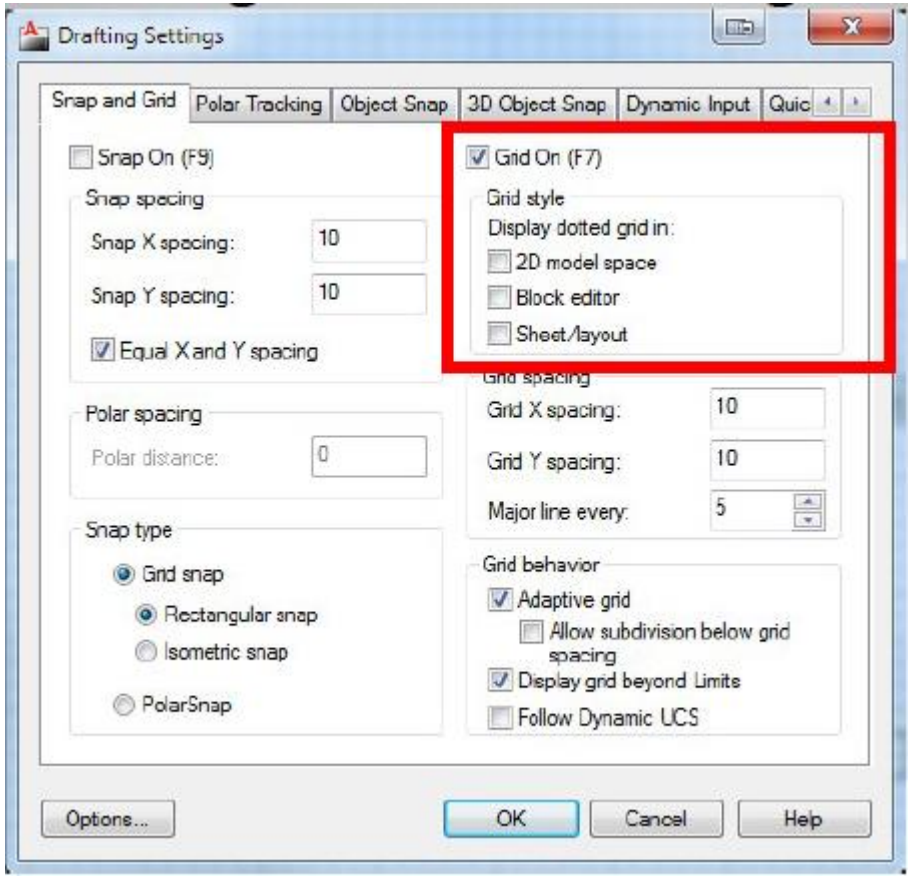
The grid is merely a visual “drawing aid”. The default spacing is 1 unit. You may change the grid spacing at any time using: TOOLS/DRAFTING SETTINGS.

It displays a dot grid in the current view port.

Command: grid Grid spacing (x) or ON/OFF/Snap/Aspect/<current>: specify a value or enter an option.

Snap- Sets the grid spacing to the current snap interval as set by the snap command.

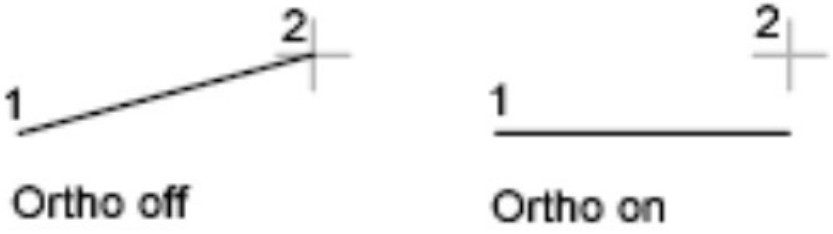
Aspect- Sets the grid to a different spacing in x & y.



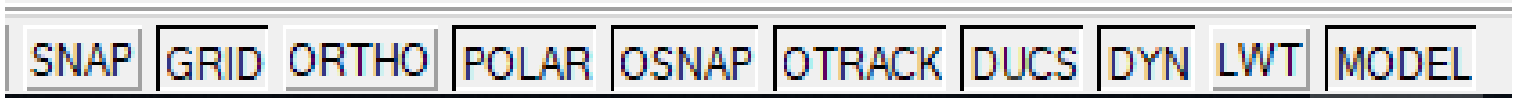
ORTHO (F8)

When ORTHO is ON, the cursor movement is restricted to horizontal or vertical.

When ORTHO is OFF, the cursor is free to move.



3. Status Bar Options:

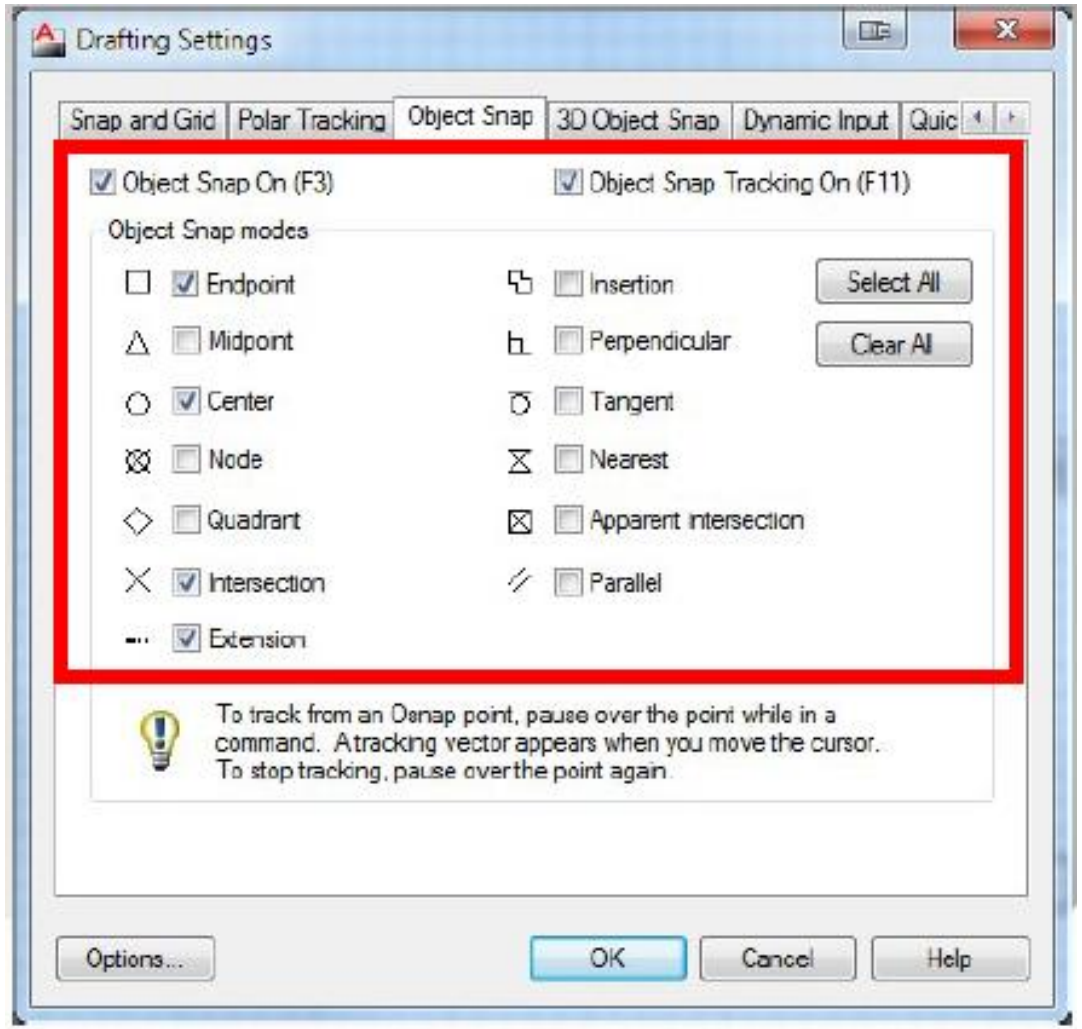


OSNAP Command: (Object Snap) (F3)

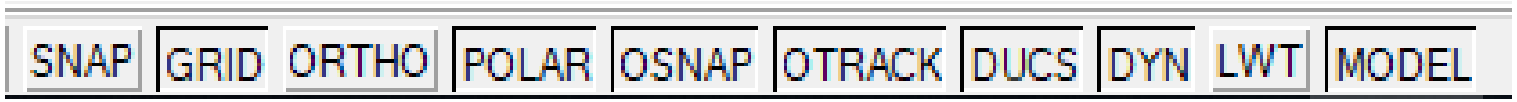
RUNNING OBJECT SNAP- specific object snaps can be set to stay active until you turn them off.

The Object Snaps (Osnaps for short) are drawing aids which are used in conjunction with other commands to help you draw accurately. Osnaps allow you to *snap* onto a specific object location when you are picking a point. For example, using Osnaps you can accurately pick the end point of a line or the center of a circle. It can be activated by clicking OSNAP option in status bar.

Shortcut Key:- OSNAP → enter , A dialogue box appears in which click the option select all and press ok.

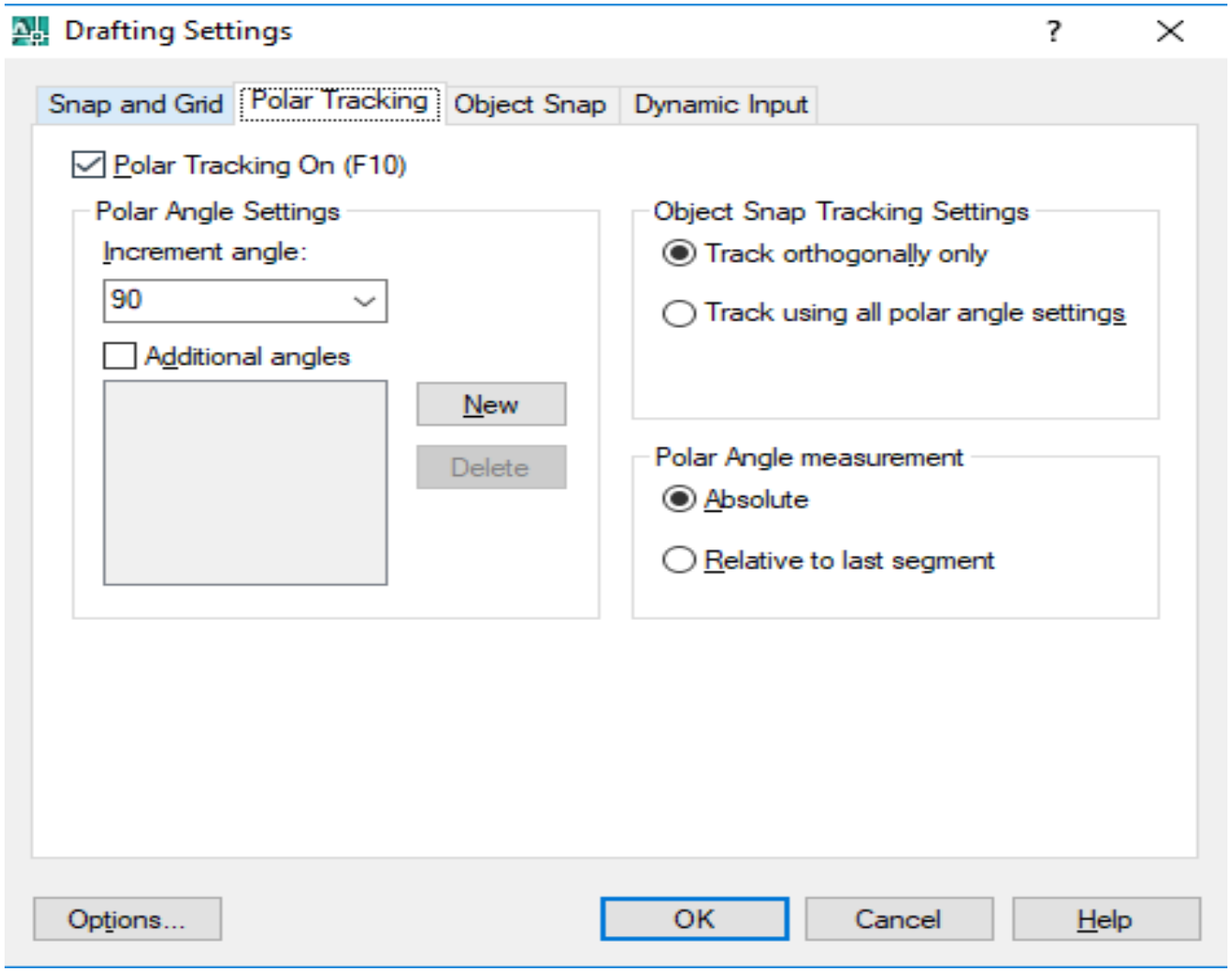


3. Status Bar Options:

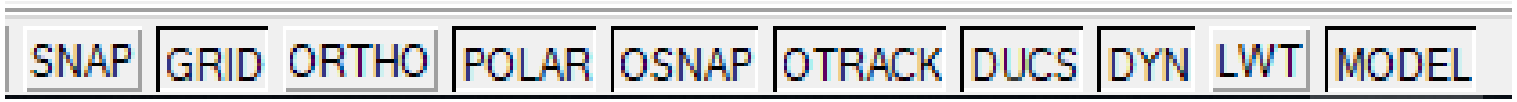


POLAR (F10)

- POLAR TRACKING creates “alignment paths” at specified angles.
- POLAR Command:- Polar tracking restricts cursor movement to specified angles. It can be activated by clicking the POLAR option in status bar.
- Allows cursor movement to the horizontal or vertical.



3. Status Bar Options:

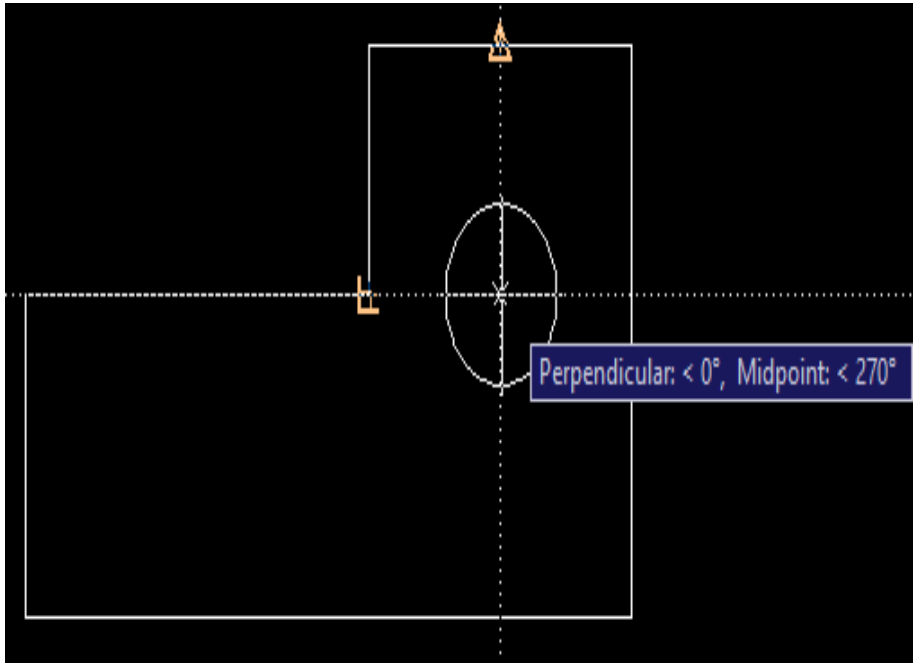


OTRACK (F11)

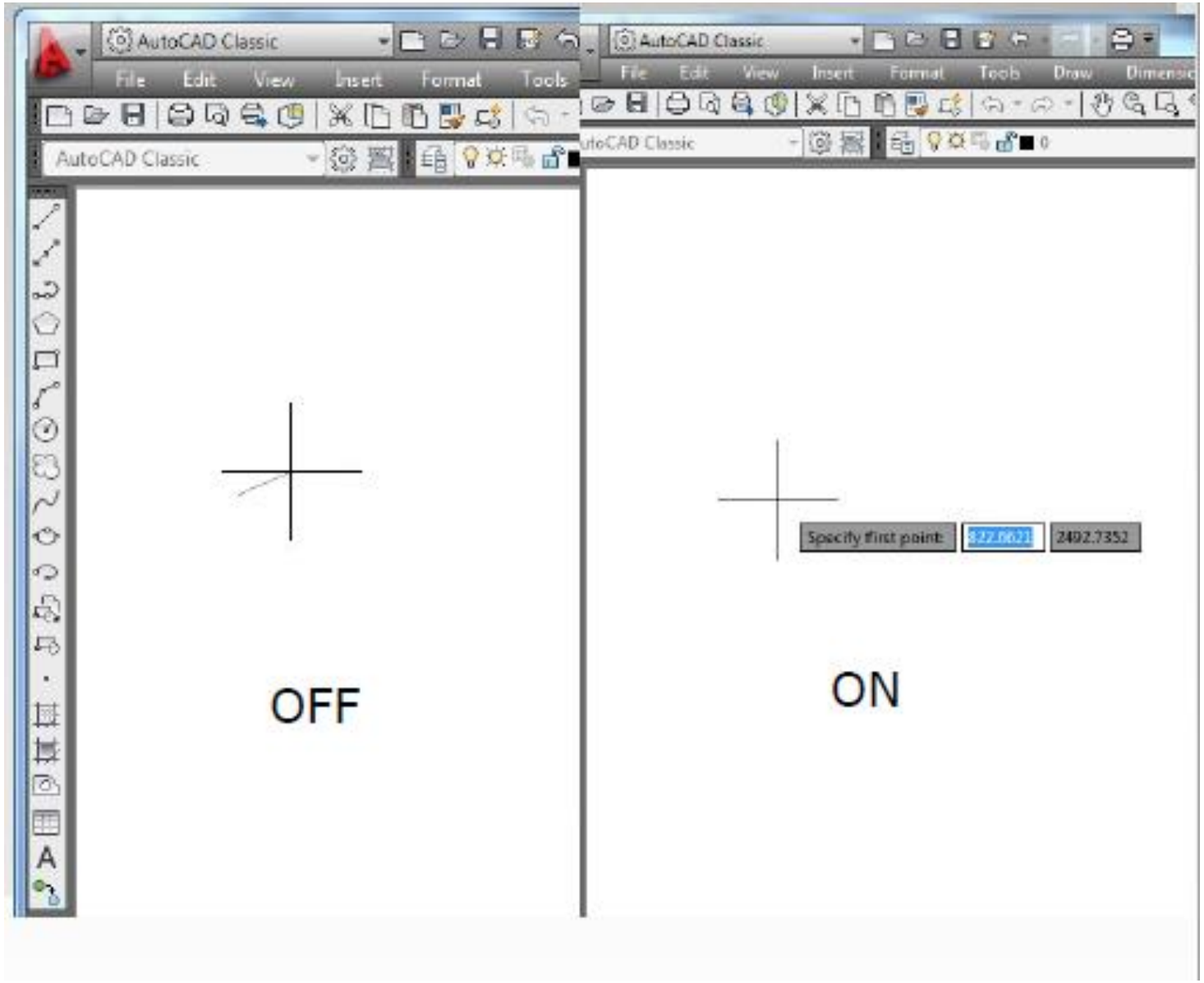
OBJECT SNAP TRACKING creates “alignment paths” at precise positions using object snap locations.

OTRACK Command:- Object Snap Tracking (OTRACK)

Works with OSNAP and POLAR to help align new points with existing locations in your drawing. OTRACK makes it easy to draw a new rectangle in line with an existing one or draw a circle to align vertically with the midpoint of a line and horizontally with an intersection. It can be activated by clicking OTRACK option in status bar.



Dynamic On/Off



AutoCAD Coordinate System

There is only 3 AutoCAD coordinates system you should know.

- **Absolute coordinates**
- **Relative coordinates**
- **Polar coordinates.**

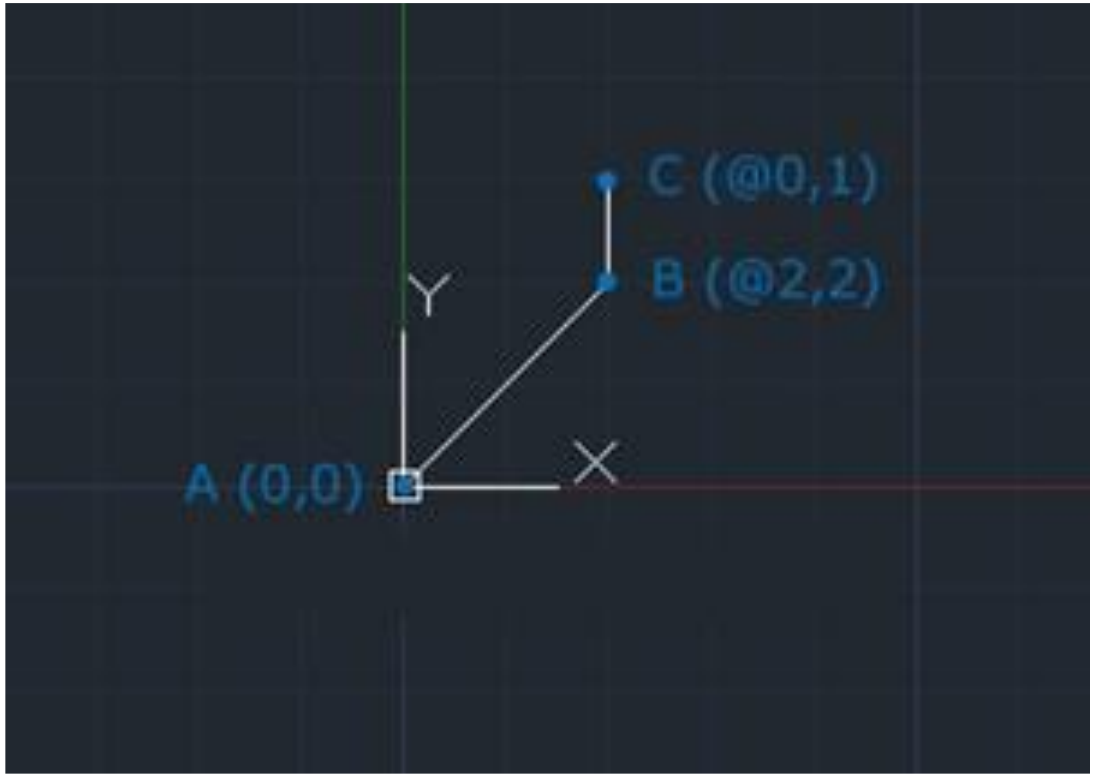
Absolute Coordinates

- All input points specify in your drawing using standard Cartesian coordinates x and y.
- Using absolute coordinate, points entered by typing x,y [Enter]

AutoCAD Coordinate System

Relative Coordinates:

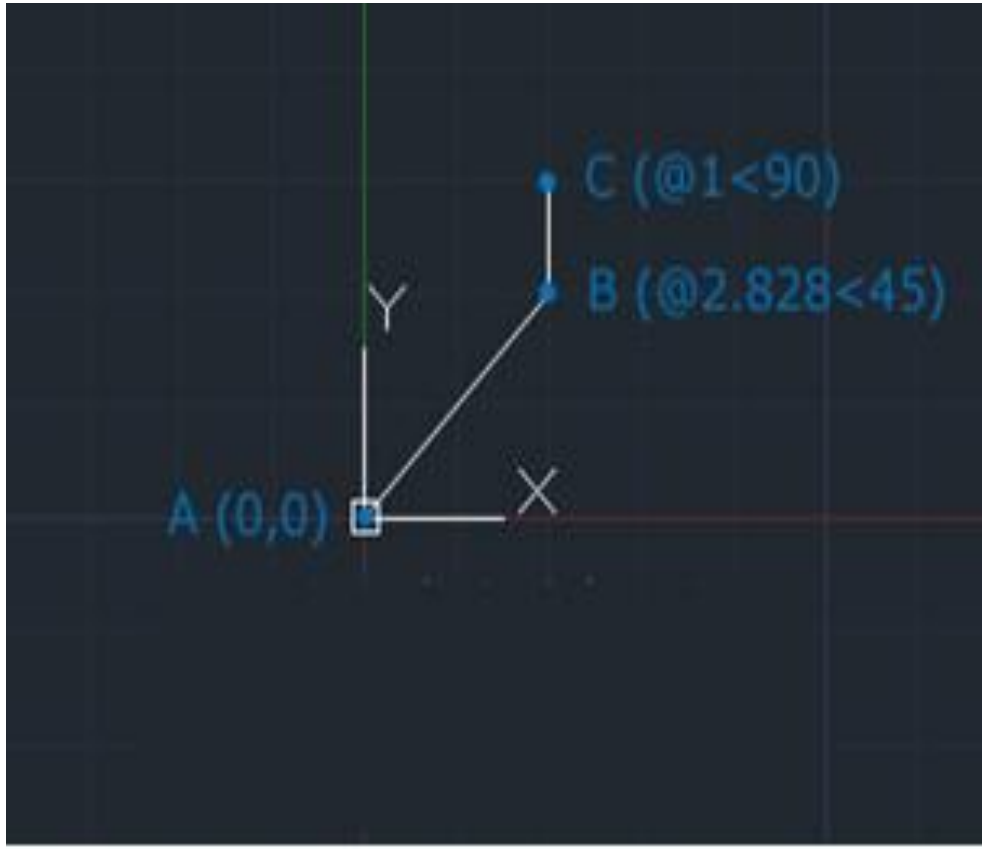
- After first points entered, your next points can be entered by specifying the next coordinate compare/relative from the first points. The relative coordinate started with symbol “@” tell AutoCAD it was a relative coordinates. Using relative coordinate, points entered by typing @x,y [Enter]



AutoCAD Coordinate System

Polar Coordinates:

Polar coordinates used when you need to draw the next points at specify angle. Polar coordinates system in AutoCAD specifies distance length at which angle. Using polar coordinate, points entered by typing @distance<angle [Enter]



- In the **ABSOLUTE** mode: Displays the location of the crosshairs/ cursor in reference to the origin. The first number represents the horizontal (x axis) and the second number represents the vertical (y axis).
- In **RELATIVE POLAR** mode: displays the distance and angle of the cursor from the last point entered.

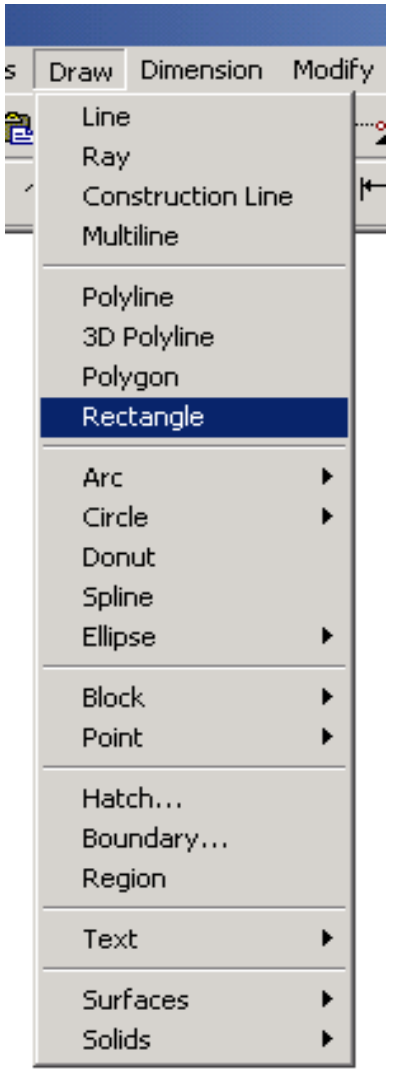
The UCS and WCS

- The AutoCAD world is 3 dimensional. However, if we want to draw a 2d object, such as a plan or a section, we will use only 2 dimensions (x and y).
- WCS (world coordinate system) is the imaginary plane that is parallel to the ground. It is the default coordinate system.
- Modifications made to the World Coordinate System (WCS) result in a User Coordinate System (UCS). It is the plane that you work on. It enables the user to draw 3 dimensional objects.
- To create a new UCS, type ucs on the command window, then say New and specify 3 points on your new UCS plane.

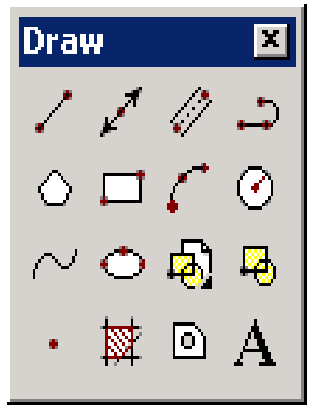
How to Enter a command

1. Choose from the pull-down menu, or
2. Click appropriate button on a toolbar, or
3. Enter command on the command line

Pull-down menu



Draw toolbar



THANKS...!

QUESTIONS ARE WELCOME ....!!!