AutoCAD 2010 BASICS

1- INTRODUCTION

AutoCAD is one of the leading software programs in the field of design and engineering drawing. The program is well known for its extensive tools, comprehensiveness and ability to handle the solution of all engineering issues easily and in addition to the working team's continuous development and improvement. AutoCAD is one of the most important graphics and engineering programs with 2D and 3D dimensions.

1-2 HOW TO START AUTOCAD 2010

There are two ways to start AutoCAD 2010:

1- While installing AutoCAD 2010, the installation program will create a shortcut on your desktop, Figure (1-1). To start AutoCAD, simply double-click this icon.

Fig. (1-1): Shortcut icon on the desktop.

2- From the **Windows** taskbar click **Start/All Programs/Autodesk/ AutoCAD2010/AutoCAD2010**.

The AutoCAD window opens with a new empty drawing file named ***Drawing1.dwg***. which will look like as shown in Figure (1-2), including the

following elements from the top to the bottom:

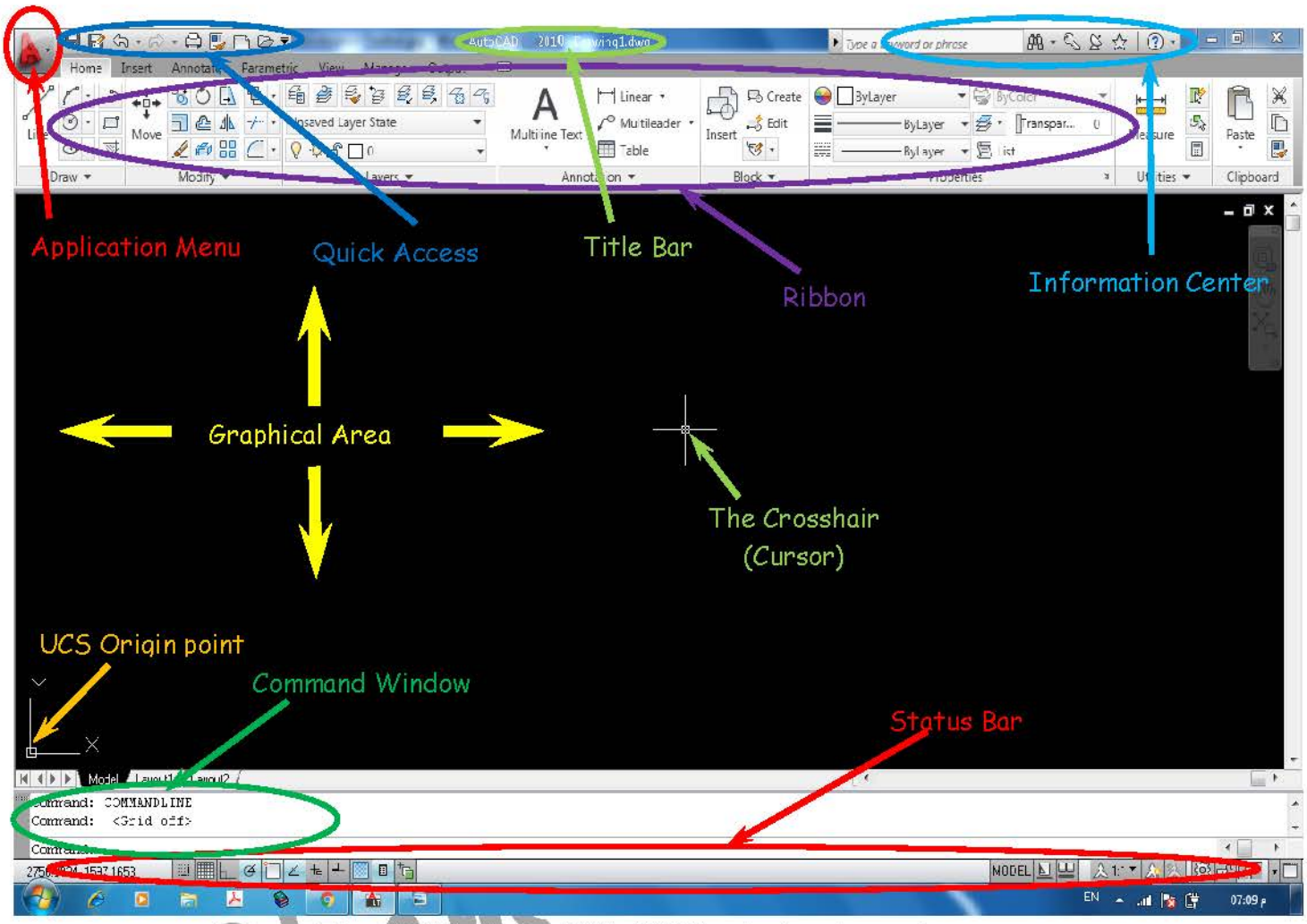


Fig. (1-2): AutoCAD 2010 window layout.

1) **Application Menu:** Click on the Application Menu, to open the following menu, Figure (1-3). Using this menu, you can, from top to bottom:

- ❖ Create a new fi le.
- ❖ Open an existing fi le.
- ❖ Save the current fi le.
- ❖ Save the current fi le under a new name (Save As) and/or in a different folder.
- ❖ Export the current fi le to a different fi le format.

- Print the current fi le.
- Publish the current fi le.
- Send the current fi le to transmit or email.
- Use all the functions related to your drawing.
- Close the current fi le.
- Exit AutoCAD.

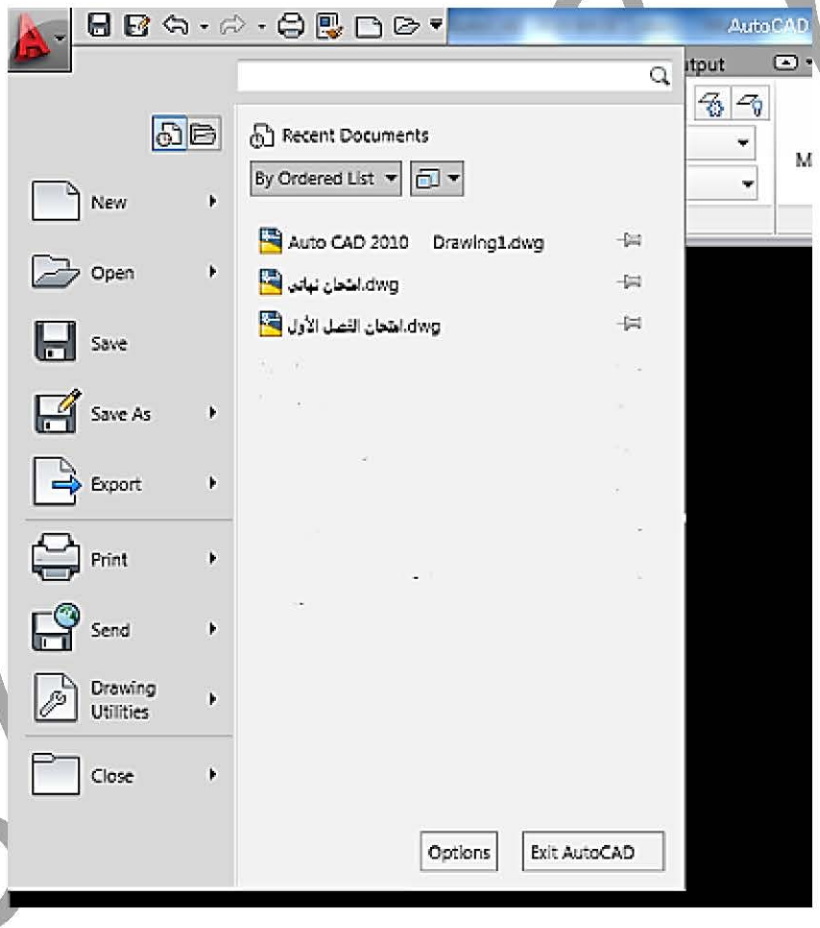


Fig. (1-3): Application menu.

2) Quick Access Toolbar: Is a small toolbar including some most needed commands such as:

- Create a new fi le.
- Open an existing fi le.
- Save the current fi le.

- ❖ Save As the current fi le in new name or format.
- ❖ Undo and redo.
- ❖ Print the current fi le.
- ❖ Any other customized command.

3) **Title Bar:** Is showing the name of the current drawing. For first time opening AutoCAD, the defaults name will be (Drawing1.dwg) and can be changed by using (Save As) command.

4) **Information Center:** The information center gives you the opportunity to type in keywords that will enable AutoCAD to search both online and offline resources and provide you with a list of related help topics.

5) **Ribbons** consist of two parts tabs and panels. For example, the **Home** tab consists of eight panels: **Draw**, **Modify**, **Layers**, **Annotation**, **Block**, **Properties**, **Utilities**, and **Clipboard**, Figure (1-4).

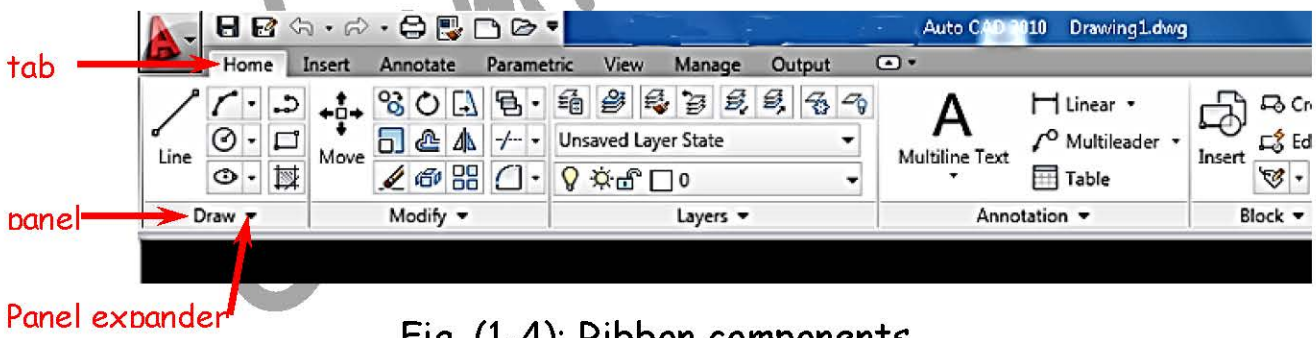


Fig. (1-4): Ribbon components.

In each tab you will see different panels. Some panels (such as the **Draw** panel) have a small triangle near the title, which indicates that there are more buttons available appear when you click on it. Some panel buttons may have a small triangle just to the right, which means there are additional options. If you hold your cursor over any button

for one second, a small help screen appears. However, if you hold your cursor over the button for three seconds, you will see an extended help screen.

6) **Graphical Area:** Is the area where you do your drawing.

7) **The crosshairs:** Using to specify points in the (X,Y) plane.

8) **Command Window:** This window shows the currently activated command and its implementation steps. The upper part of it shows the commands history, which can show the all work by pressing F2 key in the keyboard.

9) **Status Bar:** The status bar contains the coordinates of the crosshairs at the left side of it and many functions (such as object snap) that will help in drawing for more precisely.

1-3 HOW TO ACTIVATE COMMANDS

There are three methods can be used to activate the commands in AutoCAD: or

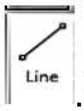
1) Type the desired command name at the command window. All AutoCAD commands can be typed in at the command line, such as (line) and press enter key or space bar key on the keyboard or right click on the pointing device (Mouse).

   Command : **Line** ↵

2) Type the abbreviation of the command name at the command window. Many commands also have one or two letter aliases that can also be typed as shortcuts to the commands, such as (l) and press enter key

or space bar key on the keyboard or right click on the pointing device (Mouse).

Command : **L** ↵

3) Press the command icon on the ribbon panel, such as 

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1-4 HOW TO SPECIFY POINTS IN AUTOCAD

Points are defined (and saved) in AutoCAD using the Cartesian coordinate system. To specify any point in our drawing we can used one of the following ways.

1) **ABSOLUTE COORDINATES (CARTESIAN):** The coordinates is the format of (±**X**,±**Y**). So the first and most traditional way of specifying points in AutoCAD is to type the coordinates whenever you are asked to do so, by typing X,Y. Absolute Cartesian coordinates specify a point's exact distance from the origin point of the coordinate system (UCS), which is represented as (0, 0), Figure (1-5).

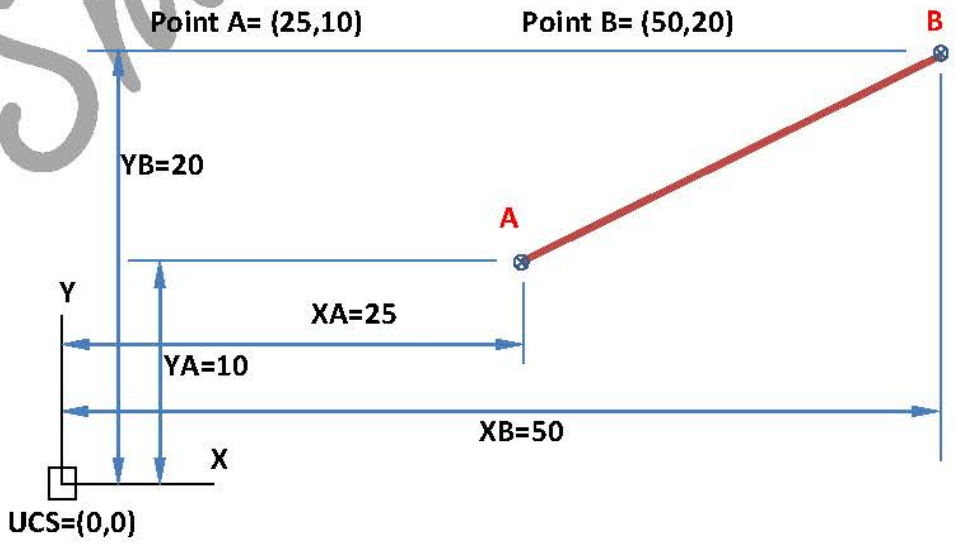

Fig. (1-5): Absolute coordinate (Cartesian) method,(x,y).

2) RELATIVE COORDINATES: The coordinates is the format of (@ ±ΔX,±ΔY). So the second way of specifying points in AutoCAD is to type the coordinates of the point's at un exact distance from the last point that was entered which is represented as (0, 0), Figure (1-6).

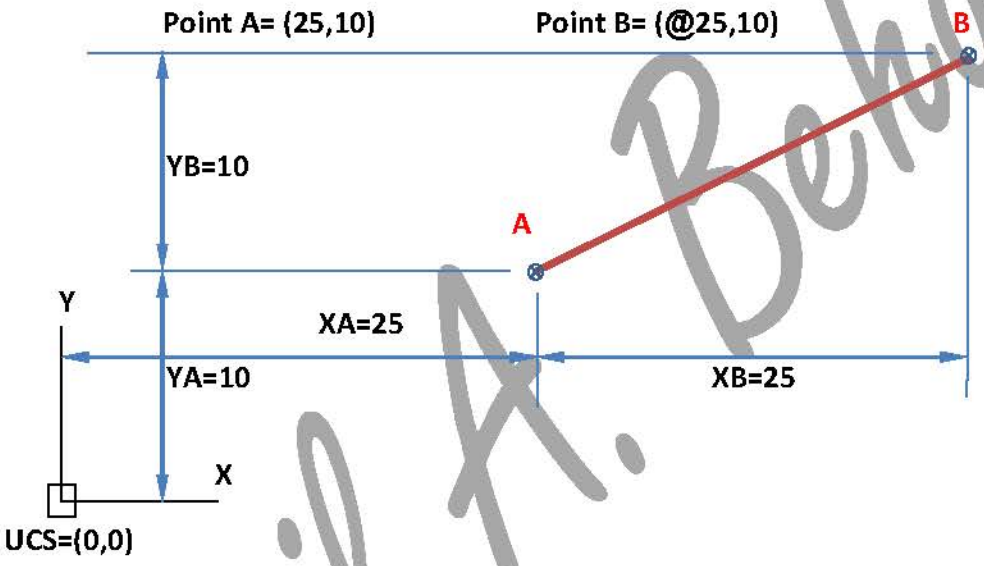

Fig. (1-6): Relative coordinates method, (@±x,±y).

Note: Use positive sign for x coordinate at the right side of the last point (0,0) and negative sign for left side of it. Also Use positive sign for y coordinate at the upper side of the last point (0,0) and negative sign for lower side of it.

3) POLAR DISTANCE: Specify a point's exact location by a distance and angle from the last point that was entered. The format of the point is (@ L < ±Θ°) where Θ is the rotation angle of the line from east direction, Figure (1-7).

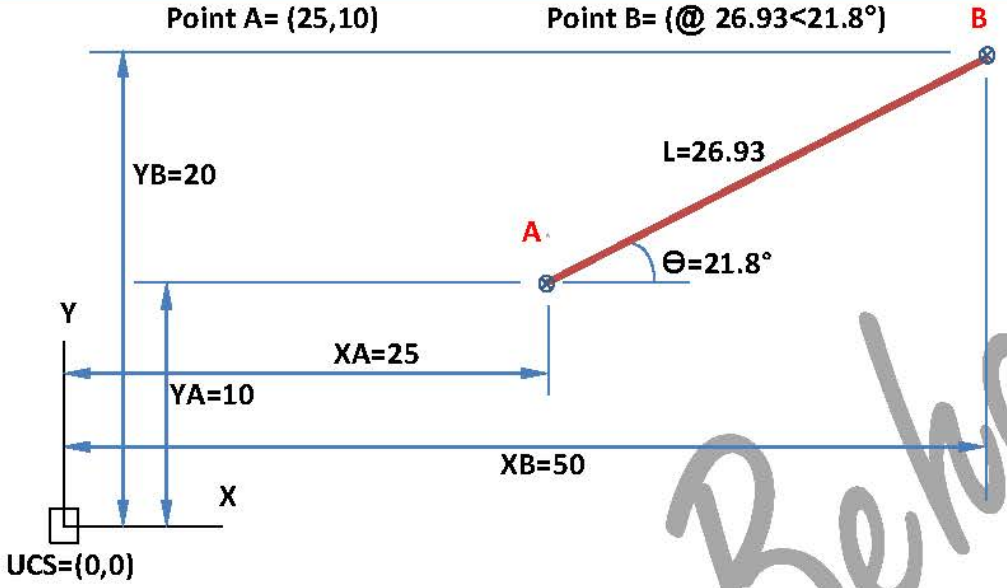

Fig. (1-7): Polar distance method, (@ L< ±Θ°).

Note: The distance is always positive and the positive angle is measured starting from the positive X axis, (at the right side of origin point as zero angle) and counterclockwise (*CCW*) and negative angle is measured starting from the positive X axis, (at the right side of origin point as zero angle) and clockwise (*CW*), Figure (1-8).

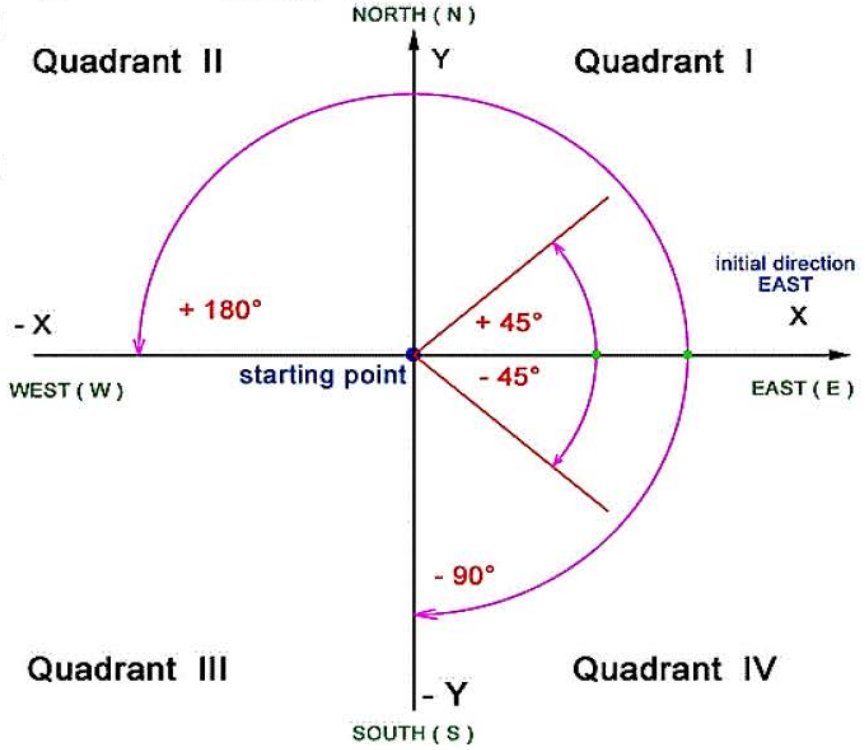

Fig. (1-8): Coordinates system and angle direction.

1-5 CROSSHAIR SHAPE IN AutoCAD

Crosshair (Cursor) shapes changed in AutoCAD's graphical area into three different shapes, and each shape means that dissimilar situations:

1) **Standard Crosshair:** When the cursor is in the form of two intersecting lines and square at the intersection center ( ). This cursor shape will appears when you start AutoCAD for the first time or when there is no any command activated.
2) **Point specifying Crosshair:** When the cursor is in the form of only two crossed lines ( ). This shape means that you must specify a point in the screen or in an existing drawing when there is an activated command.
3) **Object selection Crosshair**: When the cursor is in the form of a square only ( ). This shape means that you must select an object in an existing drawing when there is an activated command.

1-6 IMPORTANT REMARKS

- Left mouse button used to pick or select objects in three ways:
  - **a)** Direct single click on an object.
  - **b)** Single click on graphical area and dragging the mouse to the left direction to open a green tangency area touching the object or objects should be selected and another click at the opposite angle, Figure (1-10).

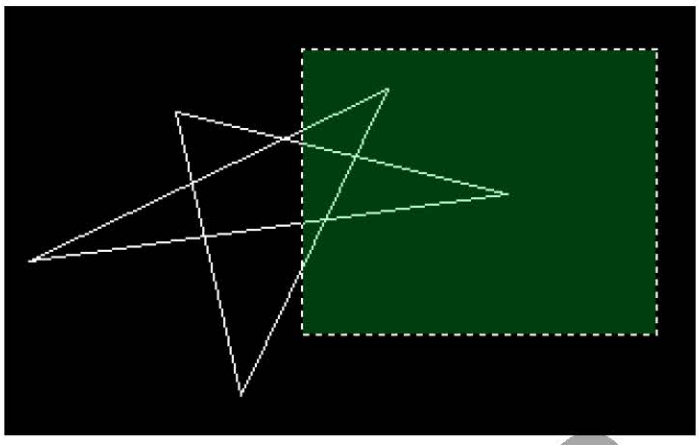

Fig. (1-10): Tangency area (green window).

c) Single click on graphical area and dragging the mouse to the right direction to open a blue containment area containing the object or objects should be selected and another click at the opposite angle, Figure (1-11).

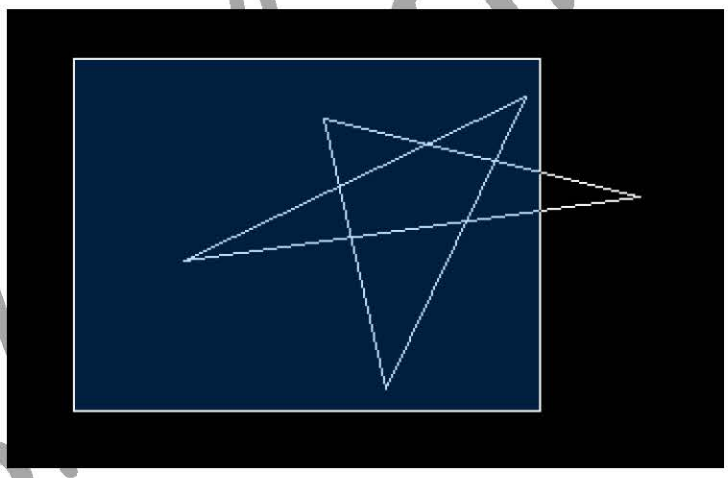

Fig. (1-11): Containment area (blue window).

- Right mouse button used to enter a command, offers a drop-down menu, or access shortcut menus.
- The mouse wheel has zooming functions, zoom in on your drawing by moving the wheel forward and zoom out of your drawing by moving the wheel backward. Zoom to the edges of your drawing by double-

clicking the wheel.

- The mouse wheel has pan function, move through the drawing by pressing the wheel and holding it and then moving the mouse in any direction, you want.
- Press ESC key on keyboard to deselect an object or to cancel any activated command.
- To repeat the last AutoCAD command, press **Enter** or **Spacebar** key on keyboard.
- Blank command line means that there is no activated command.
- Reverses the last action to undo the last command by typing **Undo** or U at the command window or click the undo icon on the Quick Access toolbar. You may need to click it a few times to undo all previous commands.

- Reverses the effects of a single UNDO command to redo the last undo command by typing REDO at the command window or click the redo icon on the Quick Access toolbar. REDO must immediately follow the U or UNDO command.

1-7 FUNCTIONS KEYS AND ACCELERATOR KEYS

The functions keys (F1-F12) available at the top of the keyboard can be used to obtaining some important functions facilitating the work on AutoCAD. These functions are shown in the Table (1-1) below. In addition,

the other options can be used to accelerate drawing on AutoCAD are shown in Table (1-2).

Tab. (1-1): Functions Keys in AutoCAD.

Option	Description
F1	Displays Help.
F2	Toggles Text Window.
F3	Toggles OSNAP.
F4	Toggles TABMODE.
F5	Toggles ISOPLANE.
F6	Toggles UCSDETECT (Not available in AutoCAD LT).
F7	Toggles GRIDMODE.
F8	Toggles ORTHOMODE.
F9	Toggles SNAPMODE.
F10	Toggles Polar Tracking.
F11	Toggles Object Snap Tracking.
F12	Toggles Dynamic Input.

Tab. (1-2): Acceleration Keys in AutoCAD.

Option	Description
CTRL+J	Repeats last command.
CTRL+L	Toggles Ortho mode.
CTRL+M	Repeats Last Command.
CTRL+N	Creates a new drawing.
CTRL+O	Opens existing drawing.
CTRL+P	Prints current drawing.
CTRL+R	Cycles layout viewport.
CTRL+S	Saves current drawing.
CTRL+SHIFT+S	Brings up the Save As dailog box.
CTRL+T	Toggles Table1 mode.
CTRL+V	Pastes data from Clipboard.
CTRL+SHIFT+V	Pastes data from Clipboard as Block.
CTRL+X	Cuts objects to Clipboard.
CTRL+Y	Cancels the preceding Undo action.
CTRL+Z	Reverses last action.
CTRL+[	Cancels current Command.
CTRL+PAGE UP	Moves to the next layout tab to the left of the current tab.
CTRL+PAGE DOWN	Moves to the next layout tab to the right of the current tab.