

# LESSON 1

## LEARNING OBJECTIVES

*After completing this lesson, you will be able to:*

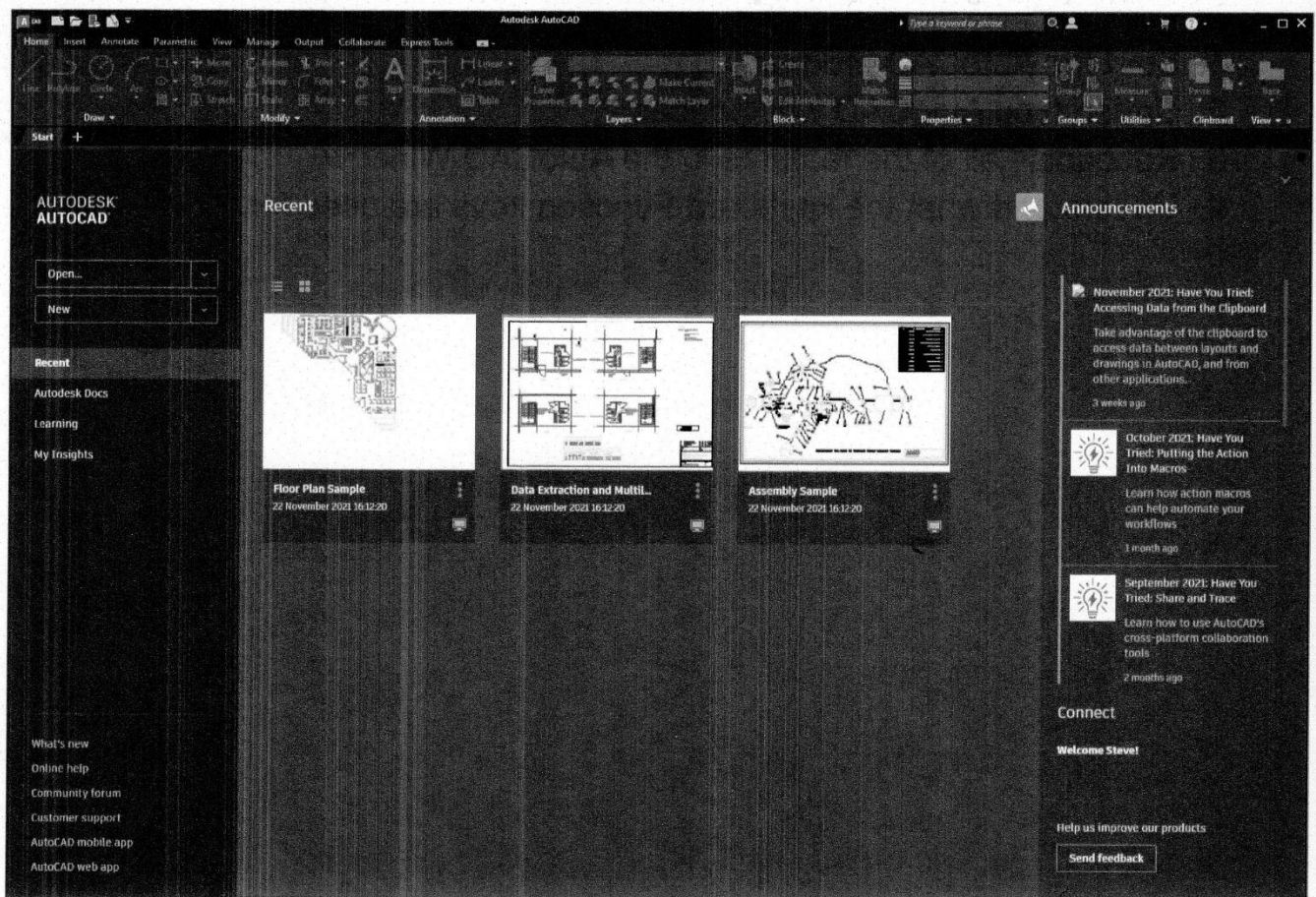
1. Start the AutoCAD program.
2. Understand AutoCAD workspaces.
3. Recognize all of the features in the AutoCAD Window.
4. Understand what the keyboard Function keys are used for.

# Starting AutoCAD

To **Start AutoCAD** use one of the two methods below. *(Be patient it may take a few minutes to load. It is a large program.)*

1. Select **Start / AutoCAD 2023** (folder) / **AutoCAD 2023**  
or  
Double click on the **AutoCAD 2023** desktop shortcut icon.
2. The “**Start**” page should appear.

**Note: Your computer should be connected to the internet.**



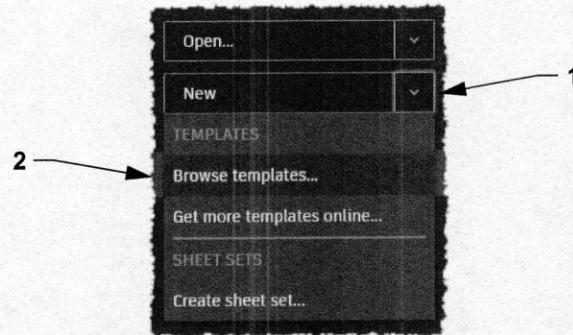
The left-hand panel contains the **Open** drop-down list where you can open an existing drawing file, sheet set, or explore sample drawing files that come pre-loaded. It also contains the **New** drop-down list where you can start a new drawing file using a recent drawing template, browse for existing templates, or get more templates online.

The center panel contains thumbnails of recently opened drawing files. There are three examples of recently opened drawing files shown in the **Recent** panel above.

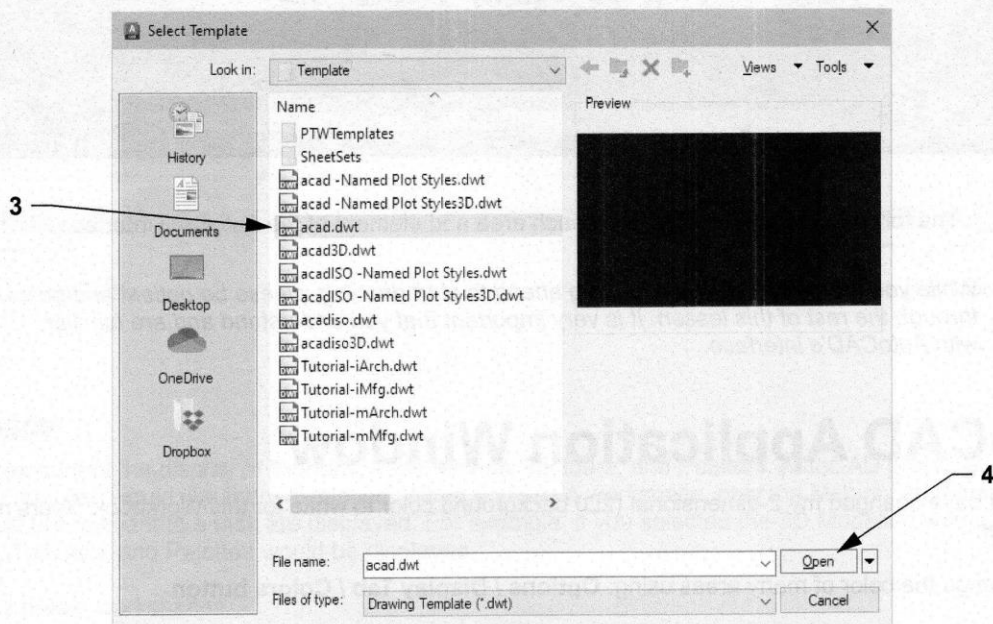
The right-hand panel contains announcements for product updates, surveys you can take part in, and helpful tips and suggestions on using AutoCAD.

You can start a new drawing by selecting the **New** drop-down list and then selecting **Browse templates...**

1. Select the **New** drop-down list.
2. Select **Browse templates...**



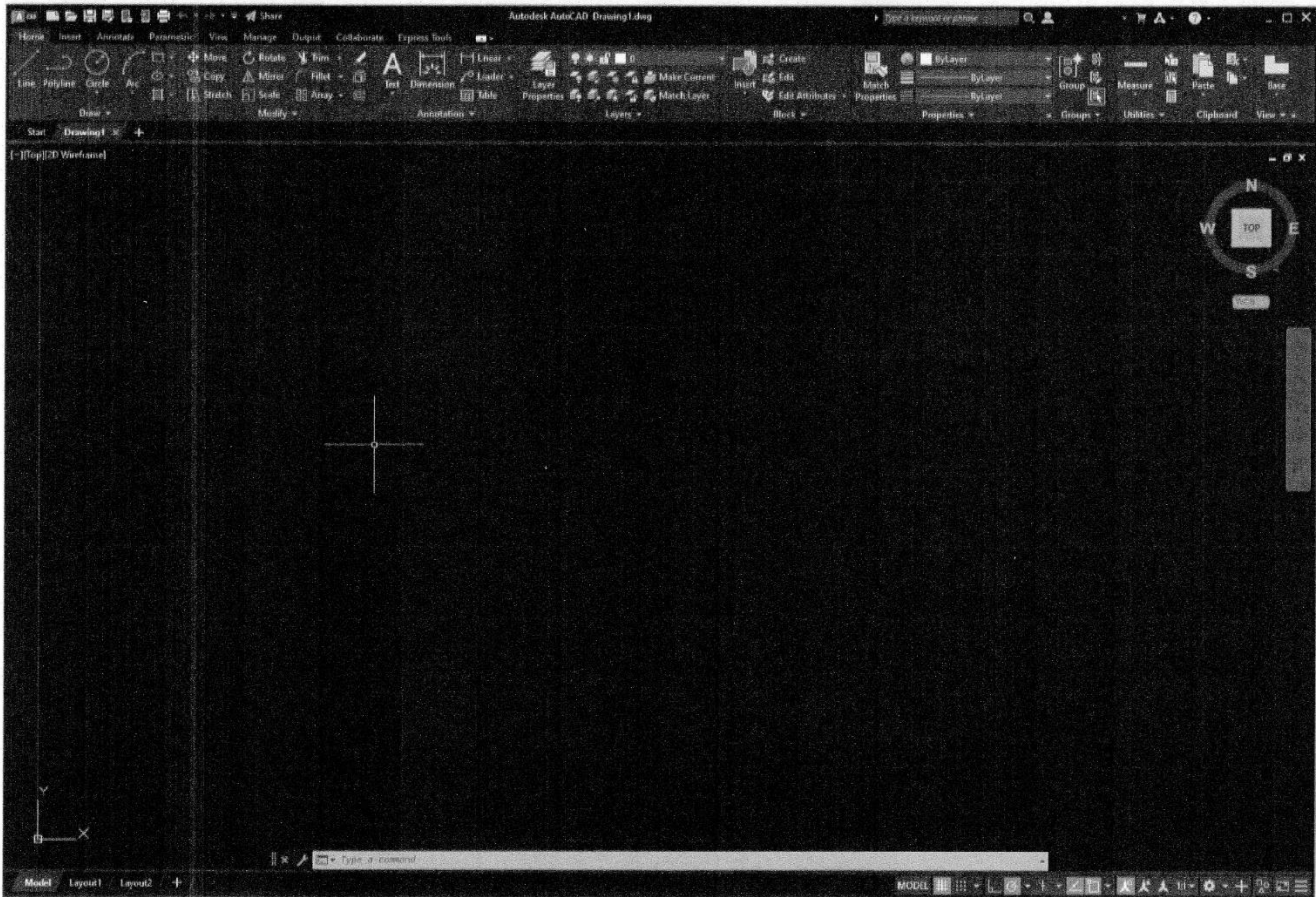
3. In the **Select Template** dialog box, select a drawing template file.
4. Select **Open**.

**Note:**

- The drawing template **acad.dwt** is for inch measurements.  
The drawing template **acadiso.dwt** is for metric measurements.



**Note:** If your screen does not appear as shown below, go to the **Intro** section of this Workbook and follow the steps for configuring AutoCAD to match the Workbook configuration.



The following section will describe each area and element of the AutoCAD interface.

*While you probably would like to jump ahead to start drawing, please be patient and go through the rest of this lesson. It is very important that you understand and are familiar with AutoCAD's interface.*

## AutoCAD Application Window

**Important:** I have changed my 2-dimensional (2D) background color to white for this Workbook. Yours may be another color.

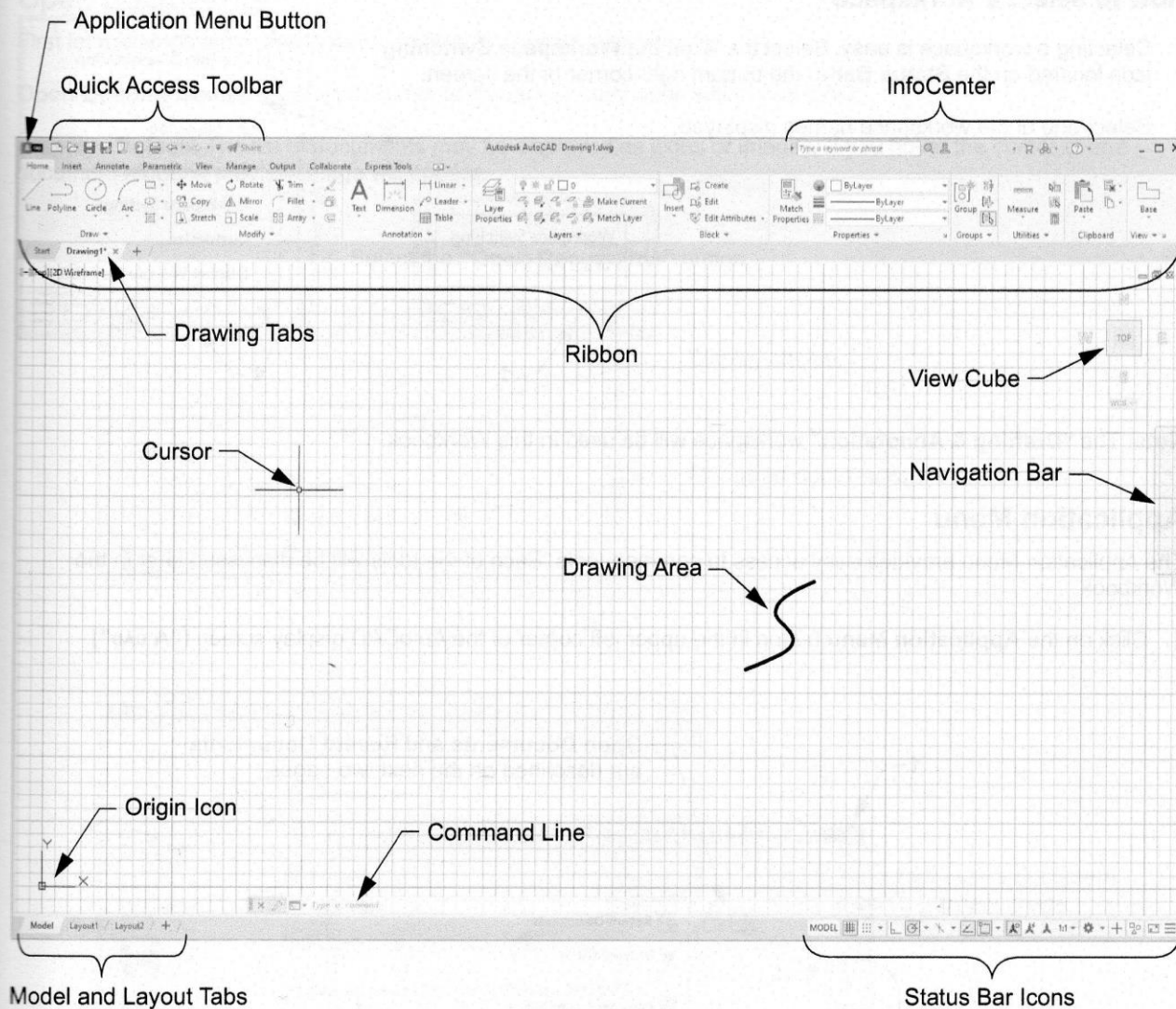
You may change the color of many areas using: **Options / Display Tab / Colors button**

AutoCAD comes with Dark and Light Color themes. I have changed to the Light theme, this is just for clarity. You may choose the Light theme.

You may change the Color theme by using: **Options / Display Tab / Color theme**

If the remainder of your screen does not appear as shown on the next page, go to the **Intro** section of this Workbook and follow the steps for configuring AutoCAD to match the Workbook configuration.

The following pages discuss the elements of the AutoCAD interface and application window, providing an introduction to workspaces, documents, display options, and various features, terms, options, and ways to find and use different commands.



## Workspace

**Workspaces** control the display of Ribbons, Tabs, Menus, Toolbars, and Palettes. AutoCAD gives you the option of deciding how you would like them displayed. When you use a workspace, only the Menus, Toolbars, and Palettes that are relevant to a task are displayed. For example, if you selected the 3D Modeling workspace, only 3D Menus, Toolbars, and Palettes would be displayed.

There are 3 preset workspaces.

### Drafting & Annotation (shown above)

This workspace is the default display. It displays the necessary Ribbons, Tabs, Menus, Toolbars, and Palettes for 2D drafting. We will be using this workspace for all lessons within this Workbook.

### 3D Basics

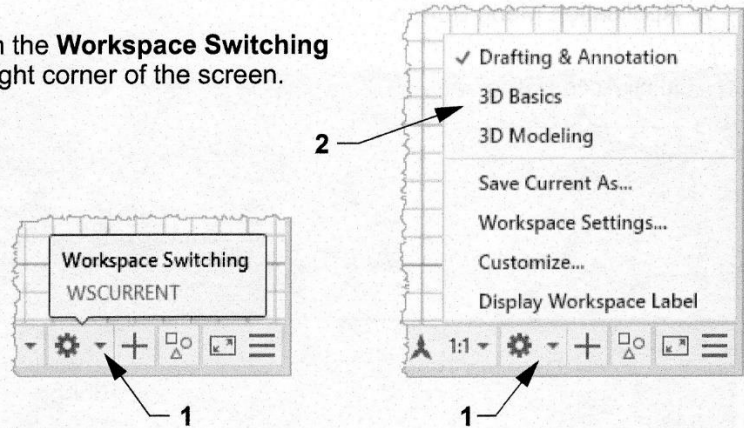
This 3D Basics workspace provides a simple workspace with the most basic tools for creating and visualizing 3D models.

### 3D Modeling

The 3D Modeling workspace provides access to the vast array of 3D tools in AutoCAD. (For more on 3D modeling, see the *Advanced AutoCAD®* and *AutoCAD® 3D Modeling Exercise Workbooks*.)

### How to select a workspace

1. Selecting a workspace is easy. Select the ▼ on the **Workspace Switching** icon located on the **Status Bar** at the bottom right corner of the screen.
2. Select one of the workspace names displayed.

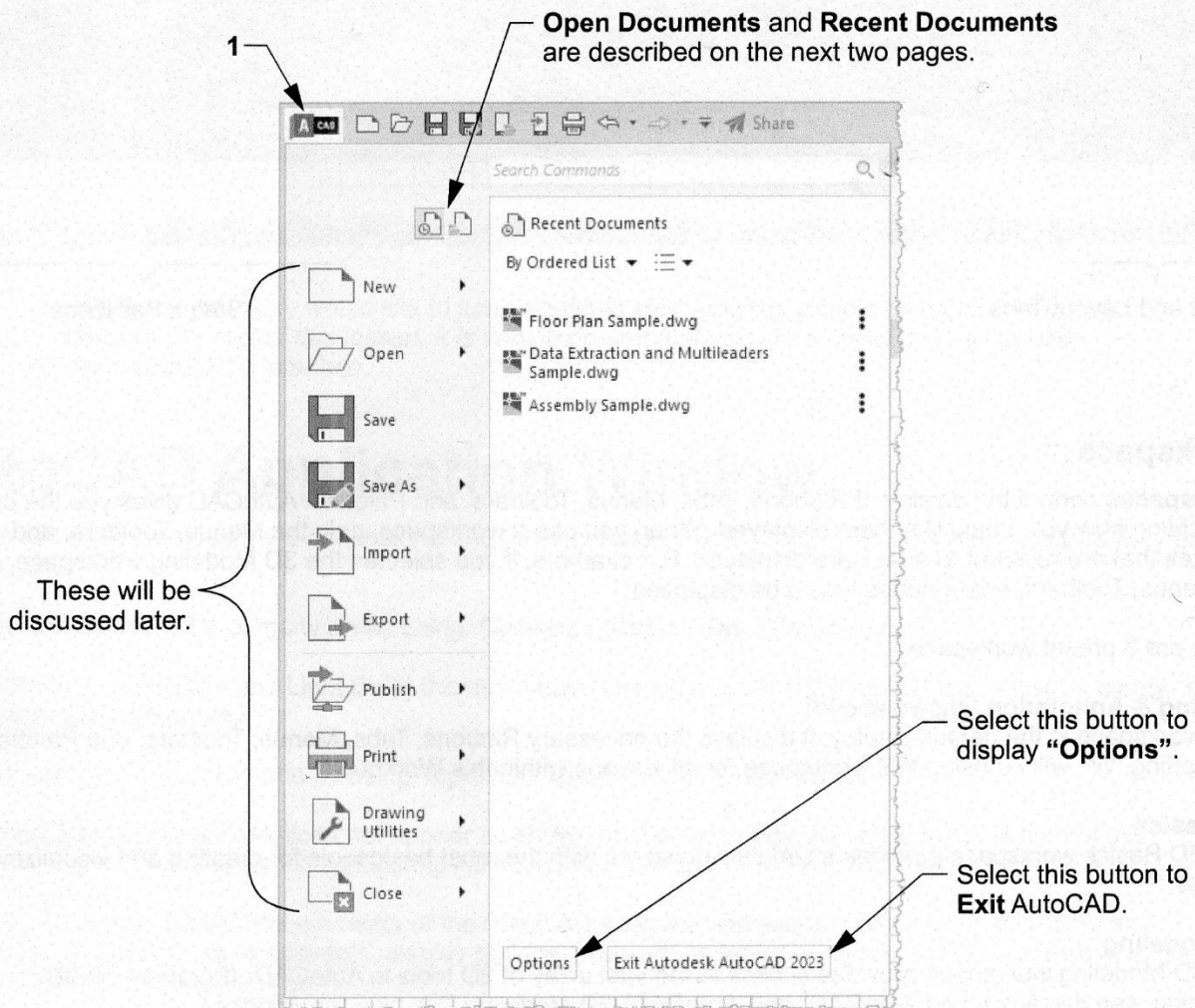


**Note:** The “Drafting & Annotation” workspace will be used in this Workbook.

### Application Menu

The Application Menu provides easy access to common tools. Each of the tools will be discussed later in the Workbook.

1. Click on the **Application Menu** button in the upper left corner of the AutoCAD display screen (“A CAD”).



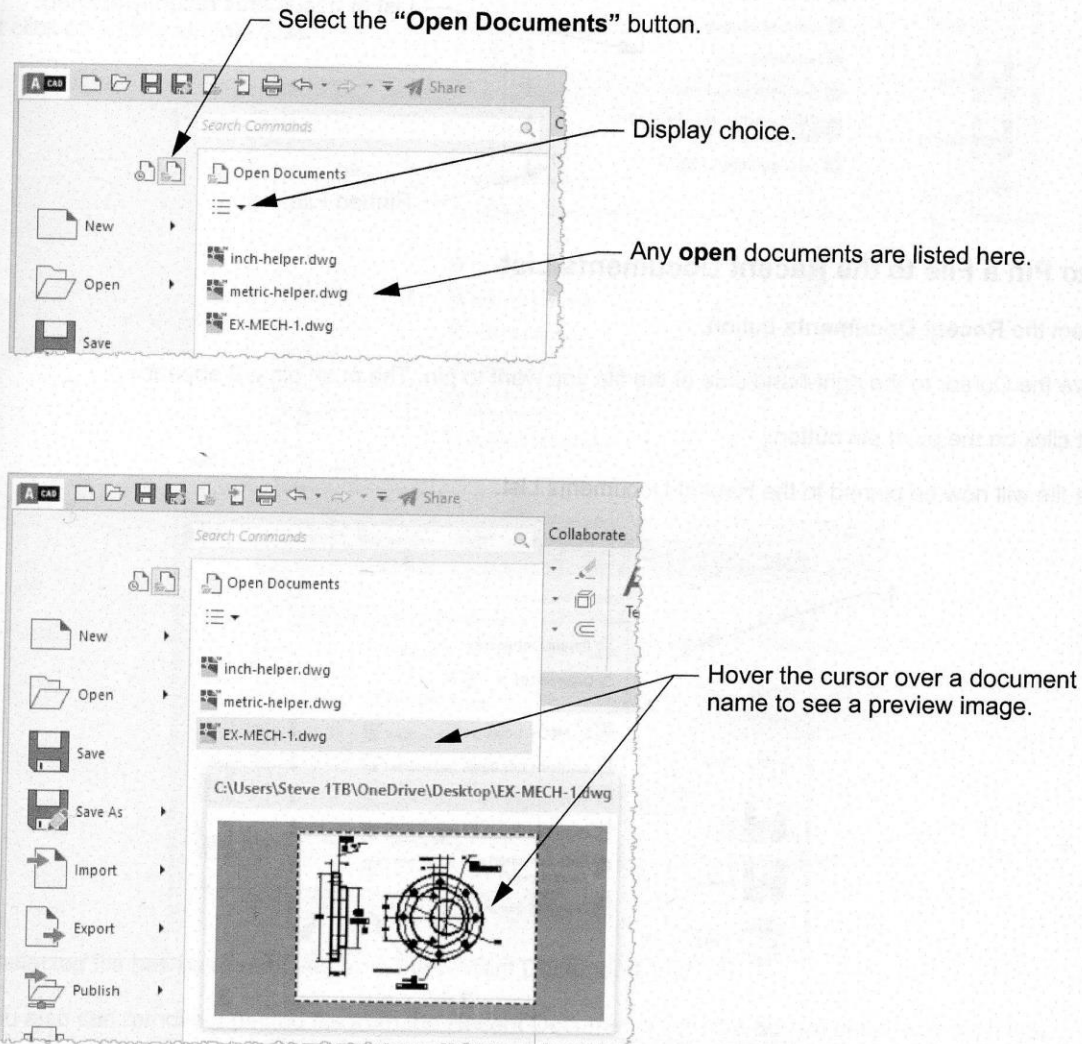


## Open Documents

First let me emphasize, this is **not** a method to “open” a drawing file.

**Open Documents** is a list of all documents that are already open within AutoCAD.

**Display choices:** The list of documents may be displayed as icons or images. If you hover the cursor over a document name, a preview image will appear.

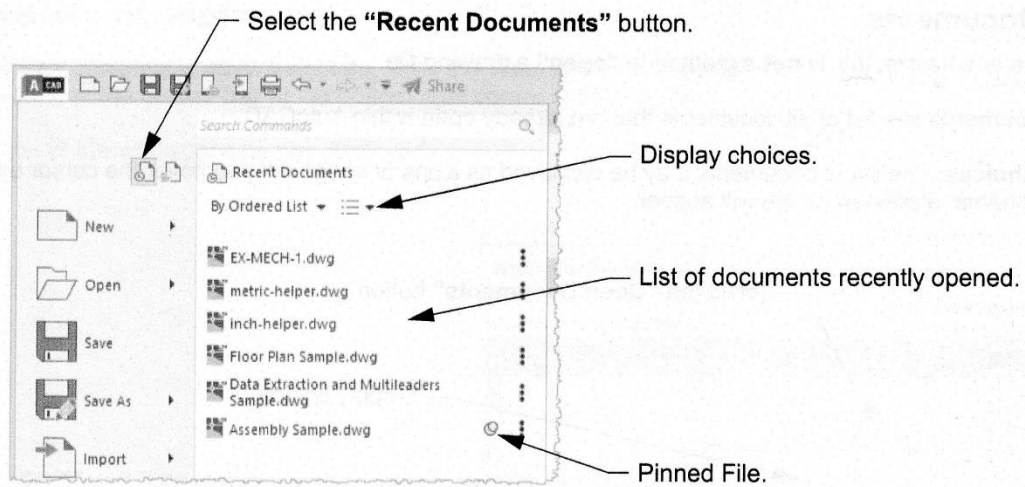


## View Recent Documents

When you select **Recent Documents** button, a list of the recently viewed documents will appear.

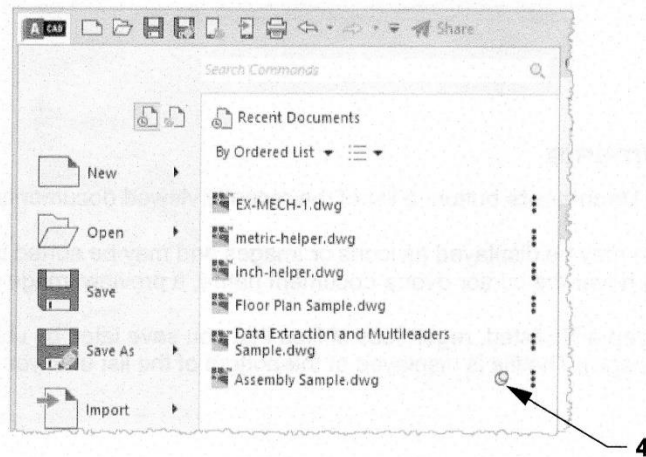
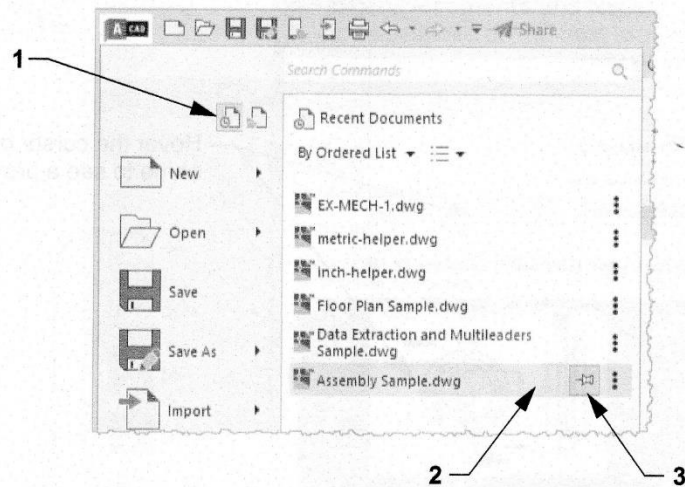
**Display choices:** This list may be displayed as icons or images and may be sorted in an ordered list or grouped by date or file type. If you hover the cursor over a document name, a preview image will appear.

**Pinned Files:** You can keep a file listed, regardless of files that you save later, by using the push pin button to the right (shown on the next page). The file is displayed at the bottom of the list until you turn off the push pin button.



### How to Pin a File to the Recent Documents List

1. Select the **Recent Documents** button.
2. Move the Cursor to the right-hand side of the file you want to pin. The push pin will appear.
3. Left click on the push pin button.
4. The file will now be pinned to the Recent Documents List.

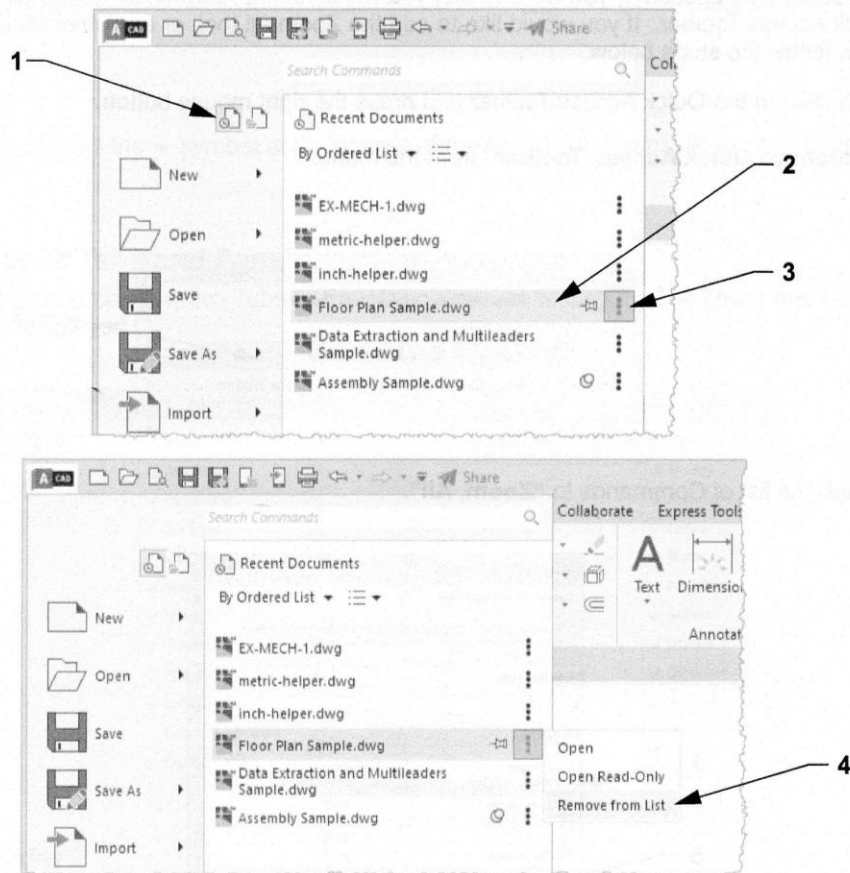




You can also remove a file from the Recent Documents List if you no longer need it.

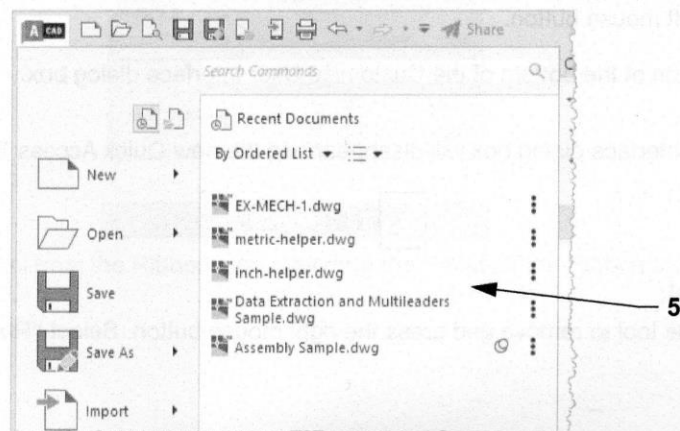
### How to Remove a File from the Recent Documents List

1. Select the **Recent Documents** button.
2. Move the Cursor to the right-hand side of the file you want to remove.
3. Left click on the button with the three vertical filled circles. A menu will appear
4. Left click on **Remove from List**.



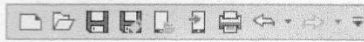
5. The selected file has been removed from the Recent Documents List.

**Note:** You also can remove a pinned file from the Recent Documents list. You **do not** have to unpin it first.



## Quick Access Toolbar

The **Quick Access Toolbar** is located in the top left-hand corner of the AutoCAD Window. It includes the most commonly used tools, such as New, Open, Save, Save as, Print, Undo, and Redo.



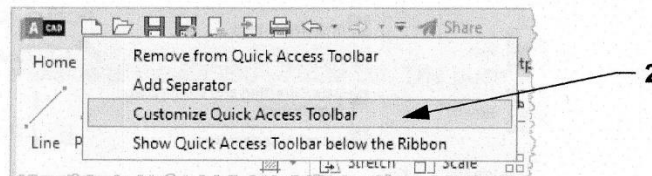
## How to Customize the Quick Access Toolbar

You can add tools with the Customize User Interface dialog box.

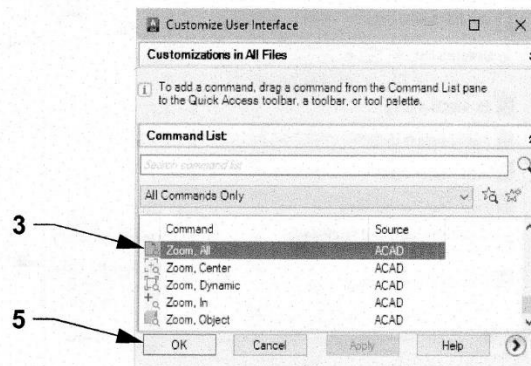
### Example:

After you have completed Lesson 4, you will find that you will be using **“Zoom All”** often. So I added the Zoom All tool to the Quick Access Toolbar. If you would like to add the Zoom All tool, or any other tool, to your Quick Access Toolbar, follow the steps below.

1. Place the Cursor on the Quick Access Toolbar and press the right mouse button.
2. Select **“Customize Quick Access Toolbar”** from the menu.



3. Scroll through the list of Commands to **“Zoom, All”**.



4. Press the Left mouse button on **“Zoom, All”** and drag it to a location on the Quick Access Toolbar and drop it by releasing the left mouse button.
5. Select the **OK** button at the bottom of the Customize User Interface dialog box.

The Customize User Interface dialog box will disappear and the new Quick Access Toolbar is saved to the current workspace.

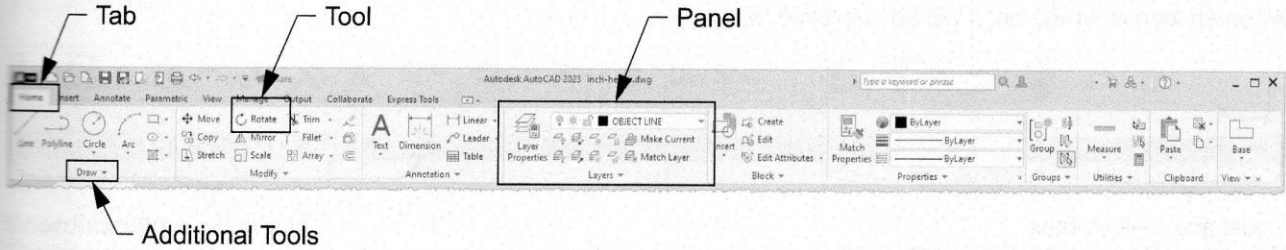


## To Remove a Tool:

Place the cursor on the tool to remove and press the right mouse button. Select **“Remove from Quick Access Toolbar”**.

### Ribbon

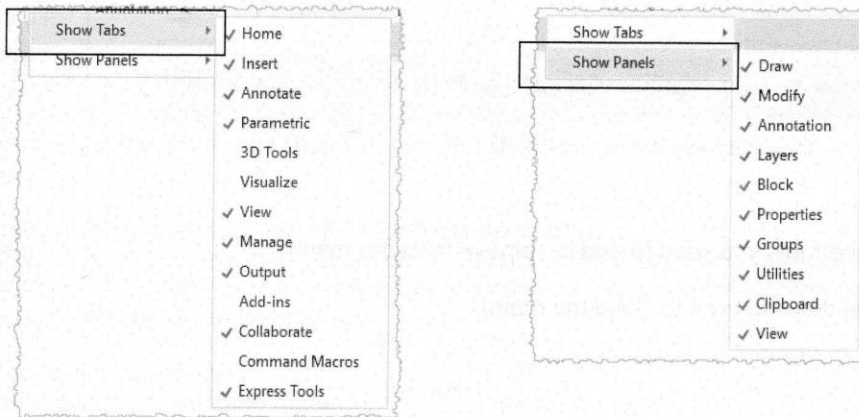
The **Ribbon** provides access to the AutoCAD tools. The **Tabs** contain multiple **Panels**. Each **Panel** contains multiple tools. When you select a **Tab**, a new set of **Panels** will appear.



**Additional Tools:** If you select the ▼ symbol at the bottom of the Panel, the Panel will expand to access "Additional Tools".

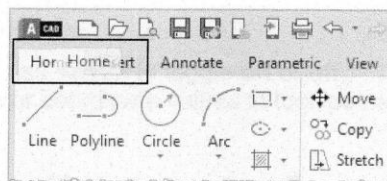
### Control the display of Tabs and Panels

Right click on the Ribbon and select which Tabs or Panels you choose to display. The check mark confirms the Tab or Panel is already displayed.



### Control the Tab order

If you would like to change the order of the Tabs, click and drag the Tab horizontally to the new location.



### Floating Panels

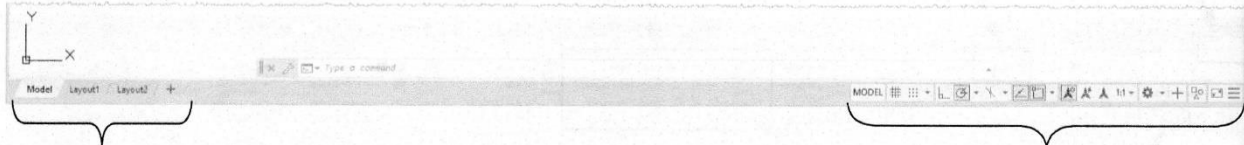
If you prefer to separate a Panel from the Ribbon, you may drag the Panel off the Ribbon to a new location on the screen.



## Status Bar

The **Status Bar** is located on the bottom of the screen. It displays the current settings. These settings can be turned **on** or **off** by clicking on one of the buttons or by pressing a corresponding function key. For example, **<F2>**, **<F3>**, etc.

When an icon is turned on, it will be displayed in blue.



Model and Layout Tabs

This will be discussed fully in Lesson 26.

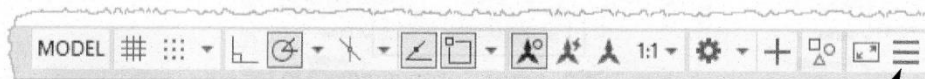
Status Bar Icons

## Status Bar Icons

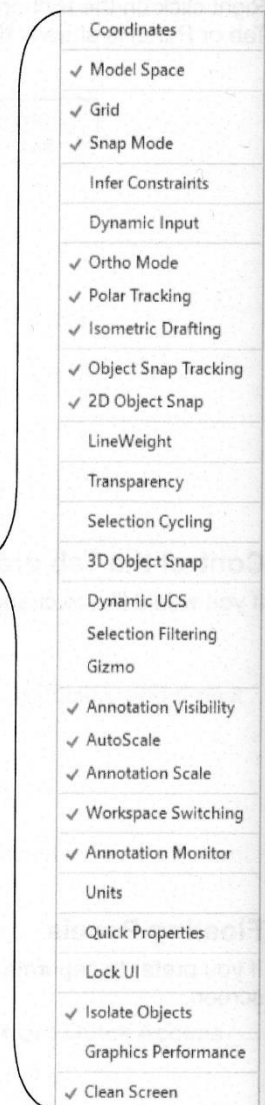
The Status Bar provides you with a set of commonly used drawing tools like Grid Display, Snap, Object Snap, and Isometric Drafting. You can choose to remove some or all of them, or you can choose to add more tools.

## To add or remove Tools from the Status Bar

1. Select and click on the **Customization** button.



2. Check or uncheck the tools you want to add or remove from the menu.
3. Left click in the main drawing area to close the menu.

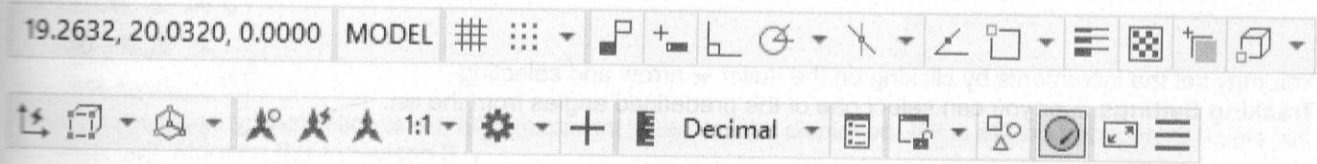


**Note:** The tools on the Status Bar may change, depending on whether you are in Model Space or Paper Space.

A brief description of each tool will be shown on the next four pages. Each tool will be discussed in more detail in future lessons.

## Status Bar Tool Button Descriptions

I have enabled all the tool buttons and broken them down into two sections starting from the left-hand side.



X Y Z

18.2620, 4.7509, 0.0000

### Coordinates

The coordinates display the location of the cursor in reference to the Origin. The Origin is currently in the lower left corner of the drawing area. These numbers will change as you move the cursor.

**First set of numbers** represents the horizontal movement of the cursor (**X axis**).


**Second set of numbers** represents the vertical movement of the cursor (**Y axis**).

**Third set of numbers** represents the **Z axis**, which is used for 3D and not discussed in this book.


MODEL

### Model

The **Model / Paper** button allows you to work in either Model Space or Paper Space without leaving the Layout Tab. When you switch to a Layout Tab, this button automatically switches to **Paper**.

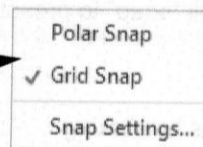
**Grid**  (You may also use **<F7>** to toggle **on** or **off**.)


The criss-cross lines in the Drawing Area are called the Grid. It is only a drawing aid and will not print. The default spacing is 1 unit of measurement. You may change the Grid spacing at any time by typing **DS**, then press **<Enter>**, and then select the **Snap and Grid** Tab from the **Drafting Settings** dialog box.

**Snap Mode**  (You may also use **<F9>** to toggle **on** or **off**.)


Increment Snap controls the incremental movement of the cursor. If it is **on**, the cursor will “snap” in an incremental movement. If it is **off**, the cursor will move smoothly. You may set the increments by clicking on the down ▼ arrow and selecting **Snap Settings...**

You can also choose whether to use **Grid Snap** or **Polar Snap** on the same menu.




**Infer Constraints**  (**Note:** Not used in this Workbook.)


Inferred Geometric Constraints automatically applies coincident constraints for Endpoint, Midpoint, Center, Node, and Insertion Object Snaps.

**Dynamic Input**  (You may also use **<F12>** to toggle **on** or **off**.)

When Dynamic Input is **on**, you can enter coordinate values in tooltips near the cursor. More on this in Lesson 11.

**Ortho Mode**  (You may also use **<F8>** to toggle **on** or **off**.)

Ortho restricts the movement of the cursor to horizontal or vertical. When Ortho is **on**, the cursor moves only horizontally or vertically. When Ortho is **off**, the cursor moves freely in any direction.

**Polar Tracking**  (You may also use **<F10>** to toggle **on** or **off**.)

Polar Tracking restricts cursor movement to specified increments along a Polar angle. More on this in Lesson 11.




You may set the increments by clicking on the down ▼ arrow and selecting **Tracking Settings...**, or you can select one of the predefined angles from the list.


- ✓ 90, 180, 270, 360...
- 45, 90, 135, 180...
- 30, 60, 90, 120...
- 23, 45, 68, 90...
- 18, 36, 54, 72...
- 15, 30, 45, 60...
- 10, 20, 30, 40...
- 5, 10, 15, 20...
- Tracking Settings...

**Isometric Drafting** 


Isometric drawing allows you to simulate a 3D object by aligning along 3 axes; these are **Top**, **Right**, and **Left**, and are called **Isoplanes**. When the button is enabled, you can toggle through the Isoplanes by pressing the **<F5>** key. Isometric Drafting is discussed in the *Advanced AutoCAD® Exercise Workbook*.

You may also change Isoplanes by clicking the down ▼ arrow and selecting from the menu.

- ✓  isoplane Left
-  isoplane Top
-  isoplane Right















**Object Snap Tracking**  (You may also use **<F11>** to toggle **on** or **off**.)

Object Snap Tracking controls the display of Object Snap reference lines, AutoSnap marker, tooltip, and magnet.

**2D Object Snap**  (You may also use **<F3>** to toggle **on** or **off**.)

When 2D Object Snap is **on**, the cursor will “snap” to preset locations on 2D objects. More on this in Lesson 4.

You may also add or remove Object Snaps by clicking the down ▼ arrow and selecting from the menu.

- ✓  Endpoint
-  Midpoint
- ✓  Center
-  Geometric Center
-  Node
-  Quadrant
- ✓  Intersection
- ✓  Extension
-  Insertion
-  Perpendicular
-  Tangent
-  Nearest
-  Apparent Intersection
-  Parallel
- Object Snap Settings...



**Lineweight**

Lineweight displays the width assigned to each object. When it is **on**, the lineweights are visible. You can change the lineweight settings by right clicking on the button and selecting **Lineweight Settings**. More on this in Lesson 3.

**Transparency**

When Transparency Show/Hide is **on**, all transparent layers will be displayed. If it is **off**, no transparent layers will be displayed. More on this in Lesson 3.

**Selection Cycling**

Selection cycling allows you to select objects that are overlapping. This is most useful when creating 3D models as discussed in the *Advanced AutoCAD® Exercise Workbook*.

**3D Object Snap**

(You may also use **<F4>** to toggle **on** or **off**.)

When 3DOsnap is **on**, the cursor will “snap” to preset locations on 3D objects. This option is discussed in the *Advanced AutoCAD® Exercise Workbook*.

**Dynamic UCS**

(You may also use **<F6>** to toggle **on** or **off**.)

Dynamic User Coordinate System changes the grid plane to follow the XY plane of the dynamic UCS. It is used for 3D; refer to the *Advanced AutoCAD® Exercise Workbook* and *AutoCAD® 3D Modeling Exercise Workbook*.

**Selection Filtering**

Selection filtering allows you to filter whether certain faces, edges, vertices, or solid history subobjects are highlighted when you roll over them, very useful in complex 3D.

**Gizmo**

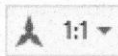
Gizmo tools help you move, rotate, or scale an object or set of objects along a 3D Plane, and are discussed in the *Advanced AutoCAD® Exercise Workbook*.

**Annotation Visibility**

When switched **on**, the Annotation Visibility tool displays or hides the visibility of annotative objects at the current scale.

**AutoScale**

When switched **on**, the AutoScale tool automatically updates annotative objects to support the annotation scale when the annotation scale is changed.

**Annotation Scale**

The Annotation Scale tool displays the current annotation scale. You can change the scale by clicking on the down ▼ arrow and selecting from the list of predefined scales or you may create a custom scale. You can also display the scale in percentages by selecting **Percentages** from the list.

**Workspace Switching**

Workspace Switching allows you to change the workspace environment: you can choose between Drafting & Annotation, 3D Basics, and 3D Modeling. You can change the workspace by clicking on the down ▼ arrow and selecting from the list.

**Annotation Monitor**

Provides feedback regarding the state of Associative annotations when using parametric dimensioning; it is discussed in the *Advanced AutoCAD® Exercise Workbook*.

**Units**

The Units tool allows you to change the display style of the Drawing Units. You can choose between Decimal, Architectural, Engineering, Fractional, and Scientific. You can change the drawing unit display by clicking on the down ▼ arrow and selecting from the list.

**Quick Properties**

If **on**, Quick Properties displays the properties of the object selected. If **off**, the Quick Properties box will not appear. More on this in Lesson 12.

**Lock User Interface**

The Lock User Interface tool allows you to lock or unlock Toolbars, Panels, Windows, and Floating Toolbars, Panels, and Windows. Click on the down arrow to select from the 4 options.

Floating Toolbars/Panels  
 Docked Toolbars/Panels  
 Floating Windows  
 Docked Windows

**Isolate Objects**

You can choose to isolate objects by keeping them visible on the screen, all other objects will be hidden. Or you can choose to hide objects. To isolate or hide objects, left click on the **Isolate Objects** tool button and select either **Isolate Objects** or **Hide Objects** from the list. To restore all hidden objects, left click on the **Isolate Objects** tool button and select **End Object Isolation** from the list.

**Graphics Performance**

The Graphics Performance tool examines your graphics card and 3D display driver and determines whether to use software acceleration or hardware acceleration. You can change the performance settings by right clicking on the tool button and selecting **Graphics Performance**, then changing any settings required in the dialog box.

**Clean Screen**

(You may also use **<Ctrl+0>** to toggle **on** or **off**.)

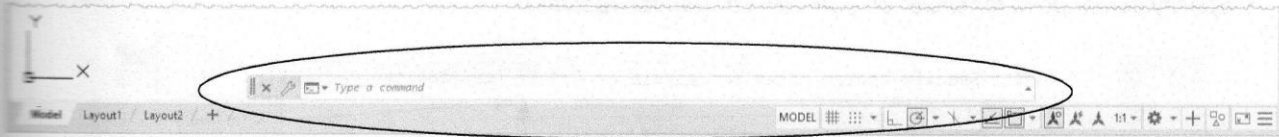
When Clean Screen is selected, it will hide all tool Palettes, Windows, and Ribbons from the screen, leaving you with a larger drawing area to work with. You can restore all the Palettes, Windows, and Ribbons by selecting the Clean Screen tool button again.

**Keyboard function keys and what they are used for.**

- F1** - Opens the Help Window.
- F2** - Displays an Extended Command History list.
- F3** - Turns the 2D Object Snaps on or off.
- F4** - Turns the 3D Object Snaps on or off.
- F5** - Toggles Isoplanes between Top, Right, or Left.
- F6** - Turns the Dynamic UCS on or off.
- F7** - Turns the Grid on or off.
- F8** - Turns Orthographic Mode on or off.
- F9** - Turns Snap Mode on or off.
- F10** - Turns Polar Tracking on or off.
- F11** - Turns Object Snap Tracking on or off.
- F12** - Turns Dynamic Input on or off.

### Floating Command Line

When you first start AutoCAD, if the software has not been modified, the **Command Line** will be displayed at the bottom of the screen, as shown below.

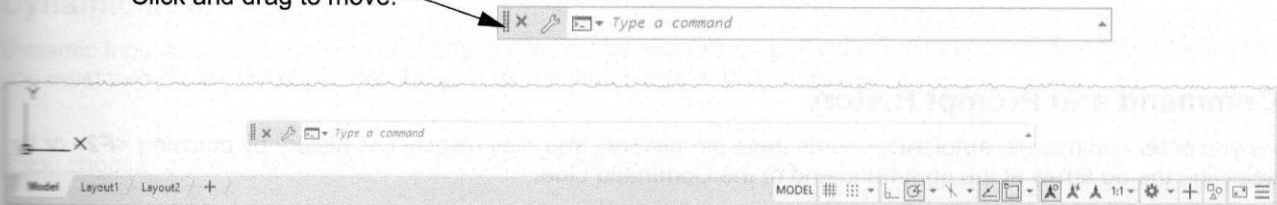


This is where AutoCAD will prompt you for information and you will enter commands, values, and select options. Basically, this is how you communicate with AutoCAD.

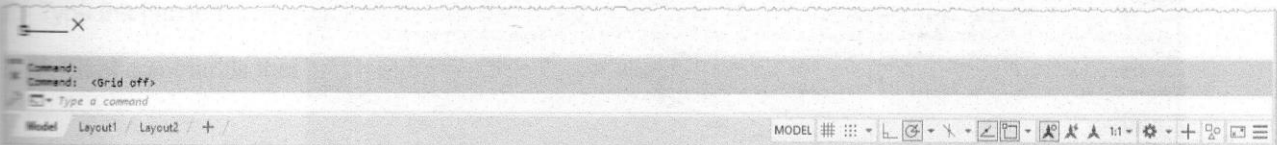
You may “dock” the Command Line at the top or bottom of the AutoCAD Window or let it float in the drawing area.

To move the Command Line, place the cursor on the left end grip, press the left mouse button, and drag the Command Line to a desired location.

Click and drag to move.



To “dock” the Command Line, drag it to the top or bottom of the drawing area. It will snap to the edge. You can’t dock the Command Line to the sides. You may also drag it below the drawing area as shown below.

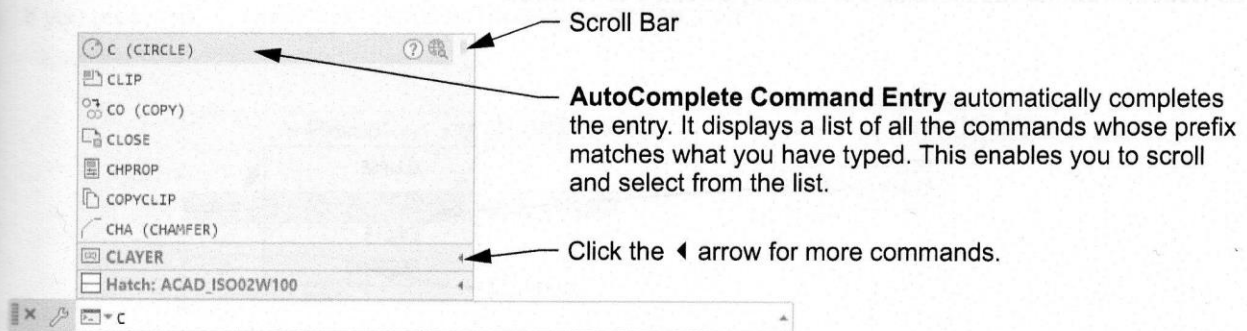


You may toggle the Command Line **on** and **off** using **<Ctrl+9>** on your keyboard.

### Command Line

#### How to enter a command on the Command Line

1. Type the first letter of a command, such as **c** for **circle**.

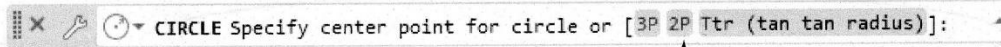


2. A list of commands that begin with the letter **C** will appear. Select the desired command from the list.



3. When you enter a command such as Circle, the **prompt** and **options** will be displayed on the Command Line.
4. The **prompt** for the Circle command asks you to:

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



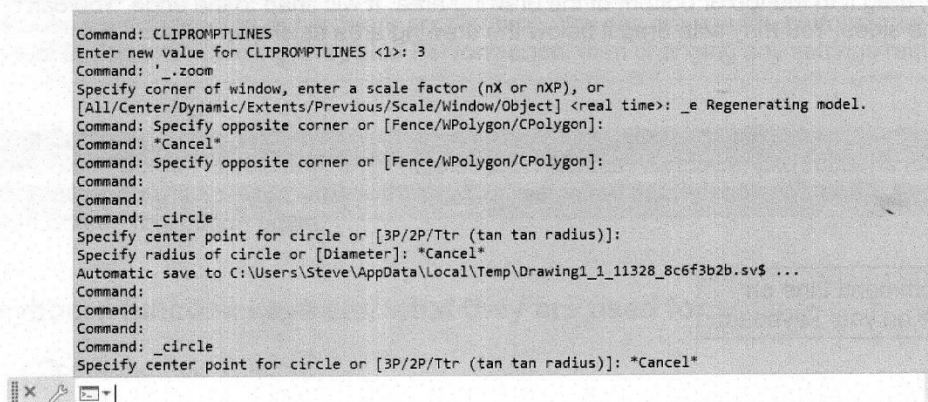
The information within the [ ] brackets are options that you may select.

Clickable options are displayed in blue. Options displayed in black must be typed or selected from the option menu.

This will be discussed more in Lesson 2.

## Command and Prompt History

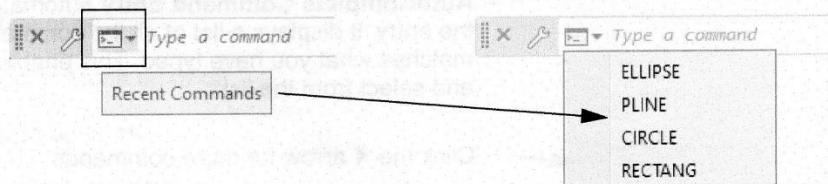
As you enter commands, AutoCAD records them as "history". You may display this history by pressing **<F2>** or by selecting the up arrow at the right-hand end of the Command Line.



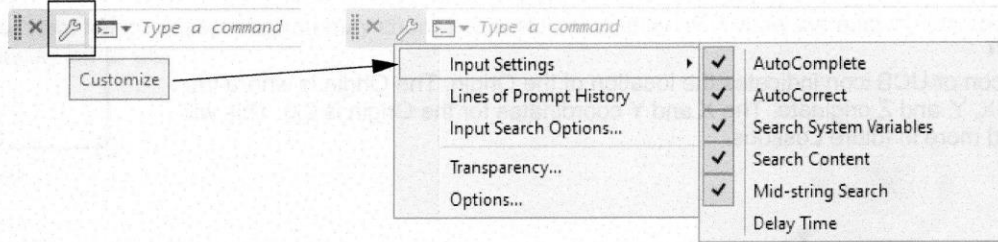
Select the up arrow to display the history.

## Command Line Tools

The **Recent Commands** tool displays recently selected commands.



The **Customize** tool allows you to select options for the AutoComplete by selecting “**Input Settings**”. You can also control how many lines of history are displayed and the degree of transparency for the Command Line.



## Dynamic Input

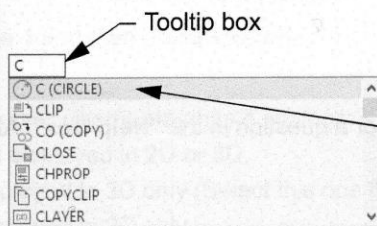
Dynamic Input is another method of inputting commands and values and selecting options. To use Dynamic Input, you must turn on the **Dynamic Input** button in the Status Bar, shown on page 1-11.



If you choose to use Dynamic Input, the command will be entered in the tooltip box beside the cursor.

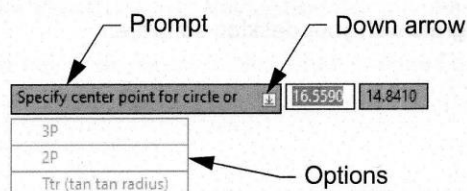
### How to enter a command using Dynamic Input

1. Place the cursor in the Drawing Area.
2. Type the first letter of a command, such as **c** for circle.
3. A list of commands that begin with the letter **C** will appear. Select the command from the list.



**AutoComplete Command Entry** automatically completes the entry. It displays a list of all the commands whose prefix matches what you have typed. This enables you to scroll and select from the list.

4. If you press the ↓ arrow, the options will appear below the prompt.



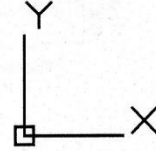
Notice that the command entry also is being displayed on the Command Line. Whether to use the Command Line or Dynamic Input is your choice. This will be discussed more in Lesson 2.

## Drawing Area

The Drawing Area is the large open area of the screen. This is where you will draw. Consider this your paper. The color of this area can be changed using **Options / Display Tab / Color**.

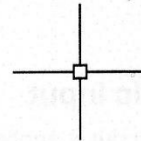
## Origin Icon

The Origin icon or UCS icon indicates the location of the Origin. The Origin is where the coordinates X, Y, and Z originate. The X and Y coordinates for the Origin is 0,0. This will be discussed more in future Lessons.



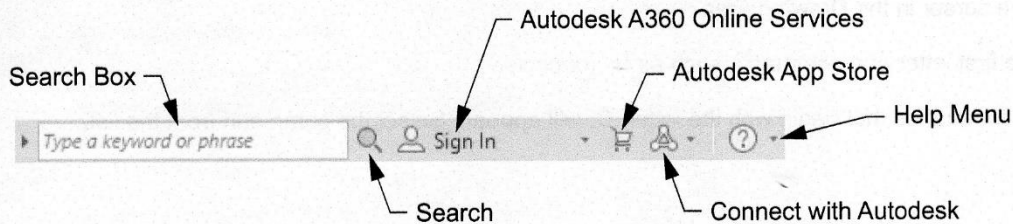
## Cursor

The Cursor is located within the Drawing Area. The movement of the pointing device, such as a mouse, controls the movement of the cursor. You will use the cursor to locate points, make selections and draw objects. The size can be changed using **Options / Display Tab / Crosshair Size**.



## InfoCenter

The InfoCenter is a tool to search for information. It is located in the upper right corner of the screen.



## Search Box

The InfoCenter allows you to search for information by typing key words or a question in the "Help Box". After typing, press **<Enter>**.

## Search

Displays multiple search options.

## Autodesk A360 Online Services

Sign in to Autodesk Online to access services that integrate with your desktop software.

## Autodesk Exchange Apps

Launches the Autodesk App Store website.

## Help Menu

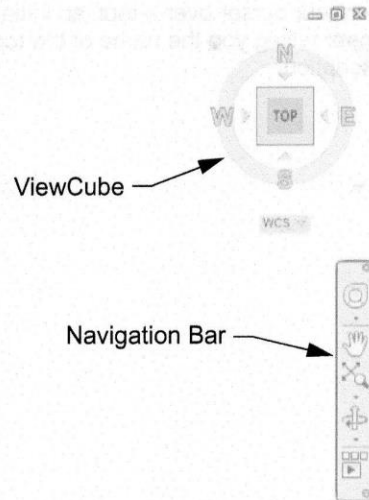
Displays the Help Window.



## ViewCube and Navigation Bar

The ViewCube and the Navigation Bar are used primarily in the 3D mode. They enable you to view and rotate the 3D model. We will not be using these tools in this Workbook. Refer to the *Advanced AutoCAD® Exercise Workbook* and *AutoCAD® 3D Modeling Exercise Workbook*.

Since we are not using these tools, you may choose to turn their display off. Follow the easy instructions below to turn the display **off** or **on**.



## How to turn off the ViewCube and Navigation Bar

There are 2 methods.

### Method 1.

1. Type **navbardisplay** and then press **<Enter>**.
2. Type **0** and then press **<Enter>**. [0 = off 1 = on]
3. Type **navvcubedisplay** and then press **<Enter>**.
4. Type **1** and then press **<Enter>**.

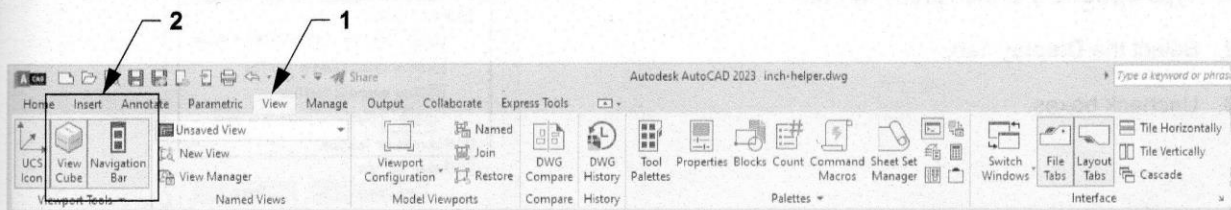
**Note:** **navvcubedisplay** has 4 settings:

- 0 = Not displayed in 2D or 3D.
- 1 = Displayed in 3D only (Select this one for the Workbook).
- 2 = Displayed in 2D only.
- 3 = Displayed in both 2D and 3D.

### Method 2.

1. Select the **View** Tab.
2. Left click on the **ViewCube** and **Navigation Bar** buttons.

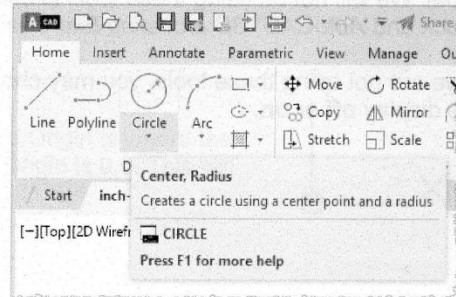
**Note:** The buttons will be displayed in blue when switched on.



# ToolTip Help

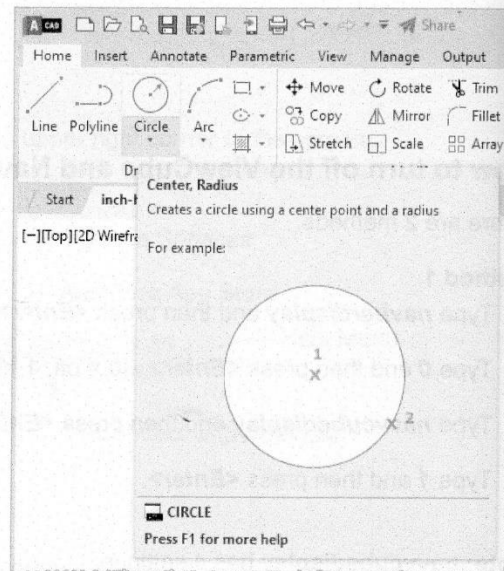
## Basic ToolTip

When you hover your cursor over a tool, an initial ToolTip will appear telling you the name of the tool with a brief description.



## Extended ToolTip

If you hover just a little longer, a graphic display, directly from the Help system, will appear.



## How to turn off ToolTips

After you become familiar with AutoCAD, you will want to turn these off. Or you may just want to delay the extended ToolTips.

1. Type **options** and then press **<Enter>**.
2. Select the **Display** Tab.
3. Uncheck boxes.

