CHAPTER 1

Starting to Draw

IN THIS CHAPTER

Getting acquainted with AutoCAD and AutoCAD LT

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In this chapter, we explain the essentials that you need to start drawing. After a little background, we discuss the basics of the screen that you see when you open AutoCAD or AutoCAD LT, and how to use it. If you've never used AutoCAD before, do the "Quick Start: Drawing a Window" chapter first.

AutoCAD and its younger sister, AutoCAD LT, are both created by Autodesk. Together they are the most widely used technical drawing programs anywhere. According to Autodesk, CAD stands for *computer-aided design,* but it can also stand for computer-aided *drafting* or *drawing*.

The first version of AutoCAD, running under DOS, came out in 1982. At the time, most other technical drawing programs ran on high-end workstations or even mainframes. AutoCAD LT was introduced in 1993, as a less expensive alternative to AutoCAD, for people who don't need all of AutoCAD's advanced features.

Exploring AutoCAD's Advantages

AutoCAD's success has been attributed to its famous *open architecture* — the flexibility that the end user has to customize the program by using source code files in plain text (ASCII) format — and programming languages (such as AutoLISP, VBA, VB.NET, C#, C++, and JavaScript).

As a result, AutoCAD is an extremely flexible drafting program, applicable to all fields. AutoCAD's support for languages other than English, including those using other alphabets, is unparalleled, making AutoCAD highly popular abroad. As a result, AutoCAD is used in all disciplines and in more than 150 countries.

Through a high level of technical innovation and expertise, Autodesk has created a program with advanced features and capabilities, including 3D surface and solid modeling and visualization, access to external databases, intelligent dimensioning, importing and exporting of other file formats, Internet support, and much more.

Comparing AutoCAD and AutoCAD LT

AutoCAD LT's advantages are its lower cost and its compatibility with AutoCAD. The programming code that is used to create AutoCAD LT is a subset of the code used in AutoCAD. Here are the major differences between AutoCAD and AutoCAD LT:

- AutoCAD includes features that enable CAD managers to hold drawings to certain standards, such as for layer names and text styles. AutoCAD LT doesn't contain these features.
- AutoCAD LT is not as customizable as AutoCAD, which is both programmable and fully customizable. It also doesn't include the Action Recorder.
- AutoCAD LT includes minimal options for 3D; AutoCAD includes a full-featured 3D capability, including visual styles and 3D rendering.
- AutoCAD LT is deployable on a network but does not have AutoCAD's network license management feature that includes reporting and flexible licensing.
- AutoCAD LT does not come with Express Tools, a set of additional routines that ship with AutoCAD.
- AutoCAD LT does not include parametric constraints, which allow you to constrain the relationships among objects, but you can use the parametric constraints that are in a drawing that was created with AutoCAD.

Some of the other differences are only in the user interface, so you can accomplish the same task but the procedure is slightly different.

Starting AutoCAD and AutoCAD LT

This section starts a quick tour of AutoCAD and AutoCAD LT. The first step is to start the program.

On the Web

You can download a 30-day trial version of the current version of AutoCAD at `www.autodesk.com/autocad-trial` and AutoCAD LT at `www.autodesk.com/autocadlt-trial`.

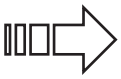
This book covers AutoCAD 2015 and AutoCAD LT 2015 running on Windows 7 or Windows 8/8.1. Every computer is set up somewhat differently, so you may need to adjust the following steps slightly. If you didn't install the software yourself and are unfamiliar with the folders (also called *directories*) on your computer, get help from someone who is familiar with your computer system.

Note

AutoCAD is available for the Mac OS; this book doesn't cover it, but you can find out more and get a free trial from the Autodesk website. Go to `www.autodesk.com/autocadformac` to learn more.

If you need information on installing AutoCAD or AutoCAD LT, see Appendix A. Appendix A also covers configuring the software and printers or plotters.

By default, installing AutoCAD or AutoCAD LT places a shortcut on your desktop or a tile on your Start screen. Double-click (Windows 7) or click (Windows 8) the shortcut to launch the program.



When you first install AutoCAD or AutoCAD LT, there are several steps that you need to follow before you can start drawing. For example, Autodesk checks your license registration. For more information, see Appendix A.

NEW FEATURE

When you open AutoCAD, you see the New tab, with two frames, Learn and Create. The Create tab is displayed by default and you can use it to open recent drawings. To just start a new drawing, click the Start Drawing tile.

Creating a New Drawing

After you launch AutoCAD or AutoCAD LT, click the Start Drawing tile on the New tab to start a new drawing named `Drawing1.dwg`. The drawing name is displayed on the title bar and you can start drawing immediately. In Chapter 2, we explain how to start a drawing based on a template and how to open an existing drawing.

STEPS: Starting AutoCAD or AutoCAD LT

1. Click or double-click the AutoCAD or AutoCAD LT icon on your desktop (Windows 7) or Start screen (Windows 8/8.1).
2. Click the Start Drawing tile on the left. You see a blank drawing named `Drawing1.dwg`.

If you are continuing with this chapter, keep this drawing open. We cover exiting from AutoCAD and AutoCAD LT later in this chapter.

Using the AutoCAD and AutoCAD LT Interface

AutoCAD offers three quite different preset *workspaces*, depending on how you want to work. For example, these workspaces determine the ribbon components and other interface items that you see. AutoCAD offers both 2D and 3D environments. AutoCAD LT has only a 2D environment, and the 2D environment is similar for AutoCAD and AutoCAD LT. In this section, we discuss the 2D environment. The Drafting & Annotation workspace is the default workspace and displays the ribbon for executing commands.

NOTE

AutoCAD's 3D Modeling and 3D Basics workspaces create a 3D environment along with the 3D drawing templates `acad3D.dwt` and `acadiso3D.dwt`. (We cover templates in Chapter 2.) We cover this 3D environment in Part IV, "Drawing in Three Dimensions."

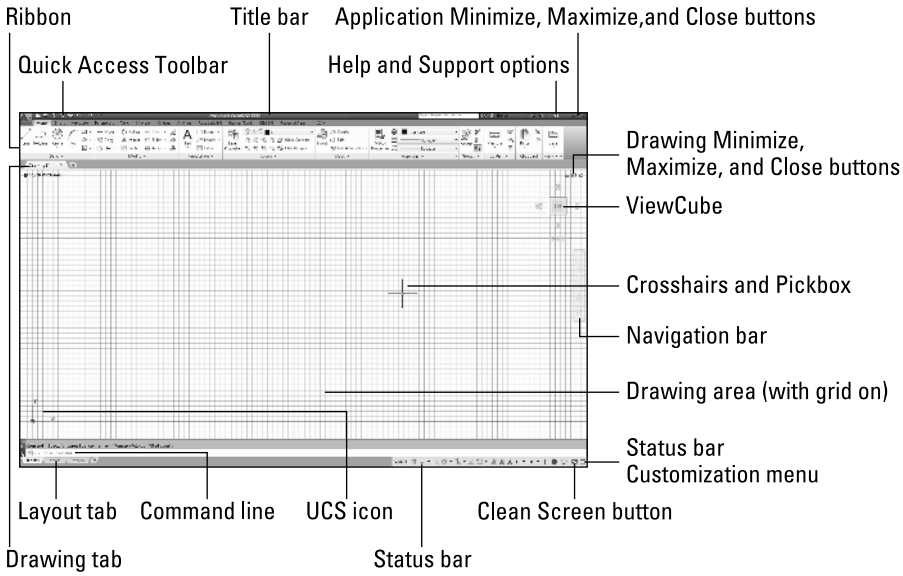
Figure 1.1 shows the default screen that appears when you first open AutoCAD or AutoCAD LT and click the Start Drawing tile. Your screen may look somewhat different — remember that AutoCAD and AutoCAD LT can be customized in many ways — but the general features will be the same. If you see other items open on your screen, you can close all these items by clicking their Close (X) button. For example, by default, AutoCAD displays the Design Feed palette.

NOTE

By default, you see a grid when you open AutoCAD. We explain how to turn off the grid in Chapter 4. The default screen color is dark gray. You can leave it that way or change the drawing area color, as we explain in Appendix A. We use a white background for the figures in this book for clarity.

FIGURE 1.1

The AutoCAD and AutoCAD LT screens are very similar, although the AutoCAD LT screen has fewer tabs.



If you find yourself in a 3D environment in AutoCAD, you'll see a gray background and a perspective view. To work in 2D in AutoCAD, switch to a 2D environment, following these steps in AutoCAD:

1. From the Workspace Switching pop-up list in the lower-right corner of the screen, choose Drafting & Annotation. This displays the ribbon with 2D commands.
2. Choose Application Button➪New. From the Select Template dialog box, choose `acad.dwt` and click Open. This creates a new drawing and places you in a 2D view.

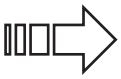
The AutoCAD and AutoCAD LT screens consist of four important areas. These are discussed in the following sections.

Exploring the drawing area

The area in the middle of the screen, called the *graphics window* or *drawing area,* is where you draw. You can think of this as a sheet of drafting paper, except that this piece of paper can be any size — even the size of a huge factory or an entire county!

By default, you draw in *model space,* so called because that's where you draw your models. When you create a new drawing, by default, you are in model space, so you can just start drawing. You can lay out your drawings for plotting in *paper space,* also called a *layout.* To switch from model space to a layout, you use the Layout tabs at the below the drawing area. You click the Model tab to switch back to model space. (See Chapter 17 for details.)

When you start to draw, you need to specify where to start drawing. One way is to use coordinates. To specify a coordinate, the universally accepted convention is to put the X coordinate first, followed by a comma, and then the Y coordinate. Examples are –3,5, 3,2, 6,–2, and –1,–1. These coordinates specify points in the drawing area.



Chapter 4 explains how to specify coordinates. To create three-dimensional models, you need to add a Z coordinate when specifying a point. Chapter 21 discusses three-dimensional coordinates.

TIP

If you want the maximum amount of free space for drawing, click the Clean Screen button at the right side of the status bar to remove the ribbon. Click the same button to get it back. You can also press Ctrl+0 to toggle between the two displays. You can double-click the active tab to cycle through three display states of the ribbon that collapse and expand the ribbon.

The UCS icon

Notice the symbol with two perpendicular lines and X and Y labels in the drawing area in Figure 1.1. This symbol is called the User Coordinate System (UCS) icon. The lines point to the positive directions of the X and Y axes to help you keep your bearings. (In a 3D environment, you see a Z axis as well.) You can change the look of this icon, and turn it on and off, as we explain in Chapter 8.

The crosshairs

In the drawing area of Figure 1.1, notice the short crosshair lines with a small box where they would intersect. The small box is called the *pickbox* because it helps you to select, or pick, objects. The lines are called *crosshairs.* They show you the location of the mouse cursor in relation to other objects in your drawing.

The ViewCube and Navigation bar

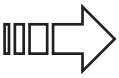
On the right side of the drawing area, semi-faded, you see two navigational tools, the ViewCube and the Navigation bar (or NavBar). The ViewCube is not available in AutoCAD LT and is mostly used for 3D navigation, which we cover in Chapter 22. You can use the NavBar to zoom and pan in 2D; see Chapter 8 for more information.

Drawing tab

Just above the Drawing area, on the left, is the current drawing tab. To the right of this tab is an asterisk icon that you can click to create a new tab and display the New Tab page. When you have multiple drawings open at once, you see a tab for each open drawing and can easily switch among drawings by clicking the appropriate tab. Right-click one of the tabs to display file management options related to that tab or all open drawings.

Exploring the ribbon and Quick Access Toolbar

At the top of the application window is the title bar, and directly beneath the title bar is the ribbon. On the left side of the title bar is the Quick Access Toolbar. The ribbon has tabs, and each tab is divided into control panels (usually called just panels), which are sections of related commands. We explain how to work with the ribbon and the Quick Access Toolbar in Chapter 3.



You can change how the screen looks by customizing workspaces, as we explain in Appendix A.

On the Home tab, in the Draw panel of the ribbon, hover the cursor over the leftmost button. You see a tooltip that says Line. Below the tooltip, a description tells you that this button creates straight-line segments. If you continue to hover the cursor over the Line button, the tooltip expands to provide more information about the command.

You use buttons on the ribbon to execute commands. For example, to draw a line, you click the Line button on the Draw panel of the ribbon's Home tab. You get some practice drawing lines in the exercise that follows. If you inadvertently start a command that you don't want to use, press Esc.

The Quick Access Toolbar contains a few often-used commands that are useful to have available all the time. Examples are commands to start a new drawing, open an existing drawing, and save a drawing.

On the Web

Because you can customize the ribbon and the Quick Access Toolbar to suit your needs, your screen may appear somewhat different. See Chapter 28 for information on customizing the Quick Access Toolbar, and see Chapter 32 for information on customizing the ribbon.

Using the Application menu

When you click the Application Button, the Application menu opens, giving you access to file-related commands, as shown in Figure 1.2.

Tip

You can display the menu bar along with the ribbon. Type menubar ↵ on the command line, and then enter 1 ↵. To hide the menu bar, enter 0 ↵. Alternatively, you can click the down arrow at the right end of the Quick Access Toolbar, and choose Show Menu Bar. Choose Hide Menu Bar to hide it.

FIGURE 1.2

The Application Button offers file-related commands, recently opened drawings, access to other open drawings, and a Search box.

When you open the Application menu, you can type a search term in the Search text box to find a command. On the right, you see a list of drawings that you opened recently. Click the Open Documents button to show open drawings rather than recently used drawings. At the top of the list of drawings, you can click a drop-down arrow to choose to display them alphabetically *(ordered list)*, by date, or by type. To the right, you can click a drop-down arrow to display the drawings as icons, or as small or large images. However, even if you display just icons, if you hover the cursor over any drawing name, an image of the drawing appears.

The Options button, at the bottom of the Application menu, opens the Options dialog box where you can specify many settings that affect how AutoCAD works. We explain the Options dialog box in detail in Appendix A.

Using the command line and dynamic input tooltip

At the bottom of the drawing area, you see a separate window containing the phrase, `Type a command`. This is the *command line.* You can execute any command by typing it on the command line.

Even if you use the ribbon to execute a command, you may see a response on the command line. AutoCAD and AutoCAD LT often provide options, which you can click on the command line or type on the keyboard. Text that you type appears on the command line. For example, when you type coordinates specifying a point, they appear on the command line.

The Dynamic Input tooltip allows you to see the text that you type at the cursor. This tooltip doesn't appear until you start typing a command. You can also choose options near the tooltip. (For more information, see Chapter 3.)

To see more of the command line, press F2 to expand the window or open the AutoCAD or AutoCAD LT Text Window. You can scroll back through previous commands. Press F2 again to close the window. You can also simply hide the Text window by clicking in the AutoCAD or AutoCAD LT window for easy access to the Text window later from the Windows task bar.

Exploring the status bar

At the very bottom of the screen is the *status bar* (refer to Figure 1.1). The status bar contains a number of buttons that we explain later in this book.

At the right side of the status bar is the Customization button. Click it to open the status bar menu. This menu determines which buttons appear on the status bar. To display or hide a status bar button, click its name on the status bar menu.

Creating a New Folder

For your work with this book, you should create a new folder so that you can save your exercise drawings where they won't get mixed up with other drawings. You should also download the drawings for the exercises and put them in two new subfolders. The following directions leave it up to you where to create these new folders.

CAUTION

We do not recommend creating a subfolder in the `AutoCAD 2015` or `AutoCAD LT 2015` folder. These folders contain the files that make up the program. If you keep your drawings here, it is too easy to make a mistake and delete necessary program files. Some people create a subfolder in the `My Documents` or `Documents` folder.

STEPS: Creating Folders for the Exercise Drawings

1. In Windows 7, right-click the Start button, and choose Open Windows Explorer. In Windows 8/8.1, go to the Start screen and click the Desktop tile. Then click File Explorer on the task bar.
2. On the left pane of Windows Explorer or File Explorer, click the drive where you want to create the new folder. If you don't know where to create the folder, choose the drive where AutoCAD or AutoCAD LT is installed. If you're on a network, choose the drive that represents your computer. If you keep your work in subfolders of the `My Documents` or `Documents` folder, click that folder.
3. If you want to make a *subfolder* (a folder within a folder), choose the folder where you want to create the subfolder.

4. Right-click the location and choose New➪Folder. A new, highlighted folder, named `New Folder`, appears in the right pane. You may have to scroll down to see it.
5. Type **AutoCAD Bible** for the folder name and press Enter. (If you did the exercises from a previous edition of this book and you already have a folder named `AutoCAD Bible`, first rename the original folder to a name specific to the earlier edition of this book.)
6. In the left pane of Windows Explorer or File Explorer, click the new `AutoCAD Bible` folder and again create a new folder. Name it `Drawings`. Again, click the `AutoCAD Bible` folder, create a new folder, and name it `Results`.
7. To download the drawings for the exercises, go to `www.wiley.com/go/autocad2015bible` or `www.ellenfinkelstein.com/autocad2015bible` (where you'll need to register). Click the Drawings download link, and save the Zip file. Repeat the process for the Results drawings. (The Results download contains the final versions of the drawings in each exercise.)
8. Move the Drawings Zip file to the `Drawings` folder and the Results Zip file to the `Results` folder.
9. Unzip the files.
10. Save all drawings that you create for this book in your `AutoCAD Bible` folder.

CAUTION
Creating a folder for your drawings as described in the previous steps is essential before you go on to exercises in the rest of this book.

Using the Interface

In the following exercise, you draw two lines to gain experience with the features of the user interface. (Chapter 3 explains in more detail how to use commands.) As explained in the Introduction, you type what appears in **bold**.

TIP
Don't worry if you don't understand everything you're doing. It all becomes clear as you progress through this book. If you haven't read this book's Introduction, now is a good time to go back and read the part that explains how to follow the exercises.

STEPS: Drawing a Line in Two Ways

1. Start AutoCAD or AutoCAD LT. This exercise assumes you are using the default Drafting & Annotation workspace in a 2D environment.
2. Click the Start Drawing tile. You see a new drawing. If you are prompted for a template, choose `acad.dwt` (for AutoCAD) or `acadlt.dwt` (for AutoCAD LT).

3. From the ribbon, choose Home tab➪Draw panel➪Line.
4. Move your mouse to move the crosshairs cursor around the screen. Notice the Dynamic Input tooltip that follows the cursor around, as shown in Figure 1.3. (For this figure, we turned off the grid by clicking the Display Drawing Grid button on the status bar.) If you don't see the Dynamic Input tooltip, click the Customization button on the status bar (the rightmost button) and choose Dynamic Input. Then click the Dynamic Input button on the status bar.

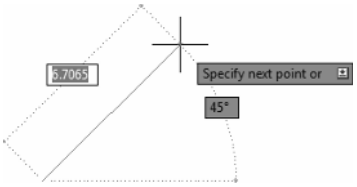
FIGURE 1.3

When you move the mouse, the Dynamic Input tooltip follows the cursor, displaying the current coordinates.

5. Anywhere on the screen, stop moving the mouse and click the left mouse button to pick a point. When you move the mouse again, the Dynamic Input tooltip changes to prompt you to specify the next point and to show you the angle and length of the cursor from the original point you picked, as shown in Figure 1.4.

FIGURE 1.4

After specifying the first point of a line, the Dynamic Input tooltip prompts you for the next point.



6. Pick any point to create a line segment. You see the same Dynamic Input tooltip as before, which means that you can continue to create more line segments. (Chapter 6 explains all about drawing lines.)
7. Press Enter to end the command and finish your line.
8. For your second line, type **line**. Notice that the text appears in the Dynamic Input tooltip as you type, but not in the command line area.
9. Press Enter. You now see the command that you typed in the command line area, as well as the Dynamic Input prompt to specify the first point.
10. Click anywhere to pick a start point.
11. Move your mouse so you can see the length and angle tooltips. Notice the value for the length. Now type a different value and press Enter. For example, if the Length tooltip says 13.7638, type **5** ↵. The line's length is based on what you typed, not where the cursor was, but the line's angle is the same as it was before you typed in the length.
12. This time, to end the line, right-click anywhere in the drawing area. By default, this opens a shortcut menu, but it may end the command. If so, you're done. If you see the shortcut menu, choose Enter from the shortcut menu to end the command.
13. Leave the drawing on your screen and complete the next exercise to save the drawing.

You should now have two lines on the screen. From this exercise, you can see how the interface offers more than one way to work. You can use the method that suits you best.

Saving a Drawing

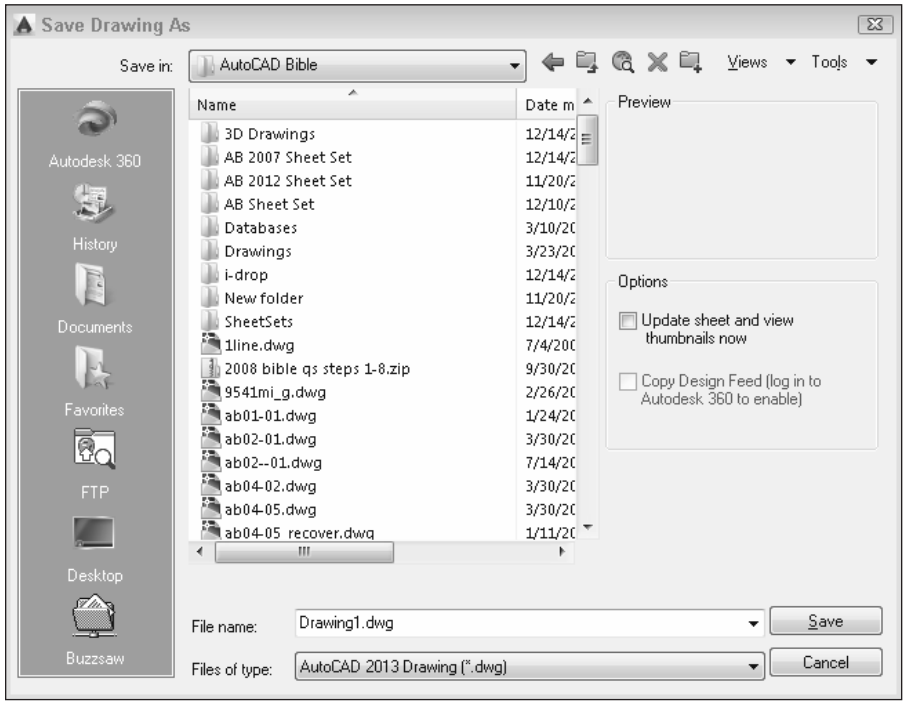
Saving a drawing on your computer is similar to saving any other file in Windows. You should get in the habit of saving your work every few minutes to avoid losing your work in case the software or your computer system crashes. Saving a drawing for the first time is different from saving it subsequently because you have to name the drawing.

NOTE
You can also save a drawing online using the Autodesk 360 service for the purpose of storage and sharing drawings with others. We cover Autodesk 360 in Chapter 27.

To save a drawing, click Save on the Quick Access Toolbar or choose Application Button➪Save. If you're saving a drawing for the first time, the Save Drawing As dialog box appears, as shown in Figure 1.5.

FIGURE 1.5

The Save Drawing As dialog box



Down the left side of the dialog box are several buttons, called the *Places list*, to help you find a location to save drawings more quickly.

TIP
Conveniently, you can reorder the buttons in the Places list. Just drag any button to a new location.

Of course, you can also choose a location from the Save In drop-down list to which you want to save the file. To save a file, type a filename in the File Name text box and click Save to save the file.

TIP
You can right-click a drawing tab and choose Save All to save all open drawings.

STEPS: Saving a Drawing for the First Time

1. The two lines you created earlier in this chapter should still be on your screen. Click Save on the Quick Access Toolbar. The Save Drawing As dialog box opens.
2. Click the Save In drop-down list. Navigate to the `AutoCAD Bible` folder (explained earlier in this chapter).
3. In the File Name text box, select the default filename that appears. Type **ab01-01** and press Enter (or click Save).
4. Keep your drawing on the screen, and go to the next exercise.

AutoCAD saves your drawing under the name `ab01-01.dwg`. This numbering system will help you organize your drawings from this book and find equivalent drawings more easily. It just means that this is the first drawing from Chapter 1 of *AutoCAD 2015 and AutoCAD LT 2015 Bible*.

Closing a Drawing and Exiting from AutoCAD and AutoCAD LT

You can close your drawing and keep AutoCAD or AutoCAD LT open. The simplest way to do this is to use the Drawing Close button at the upper-right corner of the drawing. To exit AutoCAD or AutoCAD LT, click the Close (X) box at the top-right corner of your screen. You can also exit out of AutoCAD or AutoCAD LT by typing **quit** ↵ on the command line. If you've made any changes to your drawing since last saving it, AutoCAD or AutoCAD LT asks you if you want to save your changes. Choose Yes or No as your situation requires. If you have opened more than one drawing to which you have made changes, you have a chance to save each drawing in turn.

TIP
You can double-click the Application Button to close AutoCAD. This is equivalent to typing **quit**.

STEPS: Closing Your Drawing and Exiting AutoCAD or AutoCAD LT

1. Your drawing should still be on your screen. Choose Application Button➪Close. You now see the Start screen. (Repeat this process if you have other drawings open. Save or cancel the changes to these extra open drawings as you like.)
2. Click the Close button in the upper-right corner to exit AutoCAD or AutoCAD LT.

Summary

In this chapter, we explained how to start AutoCAD and AutoCAD LT and create a new drawing. We gave you a tour of the screen and explained how to save a drawing. This chapter provided the basis for all your work in AutoCAD and AutoCAD LT.

In this chapter, you learned the following:

- A brief history of AutoCAD and AutoCAD LT
- How to start AutoCAD and AutoCAD LT
- How to start a new drawing
- The user interface and its various sections, including the drawing area, the UCS icon, the crosshairs, the ViewCube, the Navigation bar, the ribbon, the Quick Access Toolbar, the command line, and the status bar
- How to start a command from the ribbon and the command line
- How to save a drawing for the first time
- How to close a drawing and exit AutoCAD and AutoCAD LT

You may have several questions at this point, but “well begun is half done.” The next chapter explains all the ways to start a new drawing as well as how to open an existing drawing.