

Chapter 9

Editing Dimensions

Learning Objectives

After completing this chapter, you will be able to:

- Edit dimensions.
- Stretch, extend, and trim dimensions.
- Use the **DIMEDIT** and **DIMTEDIT** command options to edit dimensions.
- Update dimensions using the **DIM** command, update **DIMSTYLE**, and apply commands.
- Use the **PROPERTIES** command to edit dimensions.
- Dimension in model space and paper space.

EDITING DIMENSIONS USING EDITING TOOLS

For editing dimensions, AutoCAD LT has provided some special editing commands that work with dimensions. These editing commands can be used to define a new dimension text, return to the home text, create oblique dimensions, and rotate and update the dimension text. You can also use the **TRIM**, **STRETCH**, and **EXTEND** commands to edit the dimensions. In case the dimension assigned to the object is a true associative dimension, it will be automatically updated if the object is modified. However, if the dimension is not true associative dimension, you will have to include the dimension along with the object in the edit selection set. The properties of the dimensioned objects can also be changed using the **PROPERTIES** Palette or the **Dimension Style Manager**.

Editing Dimensions by Stretching

You can edit a dimension by stretching it. However, to stretch a dimension, appropriate definition points must be included in the selection crossing or window. As the middle point of the dimension text is a definition point for all types of dimensions, you can easily stretch and move the dimension text to any location you want. When you stretch the dimension text, the gap in the dimension line gets filled automatically. When editing, the definition points of the dimension being edited must be included in the selection crossing box. The dimension is automatically calculated when you stretch the dimension.



Note

The dimension type remains the same after stretching. For example, the vertical dimension maintains itself as a vertical dimension and measures only the vertical distance even after the line it dimensions is modified and converted into an inclined line. The following example illustrates the stretching of object lines and dimensions.

Example 1

Mechanical

In this example, you will stretch the objects and dimensions shown in Figure 9-1 to a new location using grips. The new location of the lines and dimension is at a distance of 0.5 in the positive Y axis direction. See Figure 9-2.

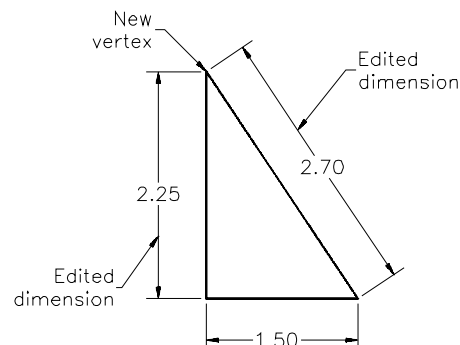
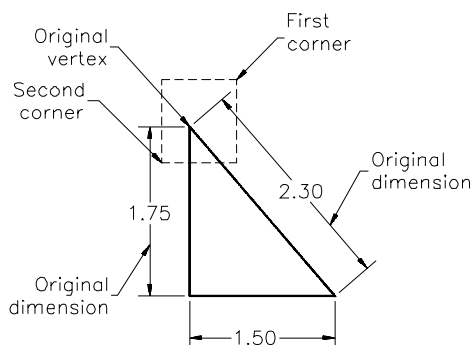


Figure 9-1 Original location of lines and dimensions **Figure 9-2** New location of lines and dimensions

1. Choose the **Stretch** button from the **Modify** toolbar. The prompt sequence is as follows:

Select objects to stretch by crossing-window or crossing-polygon

Select objects: Specify opposite corner: *Define a crossing window using the first and second corner as shown in Figure 9-1.*

Select objects:

Specify base point or [displacement] <Displacement>: *Select original vertex using the osnaps as the base point.*

Specify second point of displacement or <use first point as displacement>: **@0.5<90**

2. The selected entities will be stretched to the new location. The dimension that was initially 1.75 will become 2.25 and the dimension that was initially 2.30 will become 2.70, see Figure 9-2. Press ESC to remove the grip points from the objects.

Exercise 1

General

The two dimensions in Figure 9-3(a) are too close. Fix the drawing by stretching the dimension as shown in Figure 9-3(b).

1. Stretch the outer dimension to the right so that there is some distance between the two dimensions.
2. Stretch the dimension text of the outer dimension so that the dimension text is staggered (lower than the first dimension).

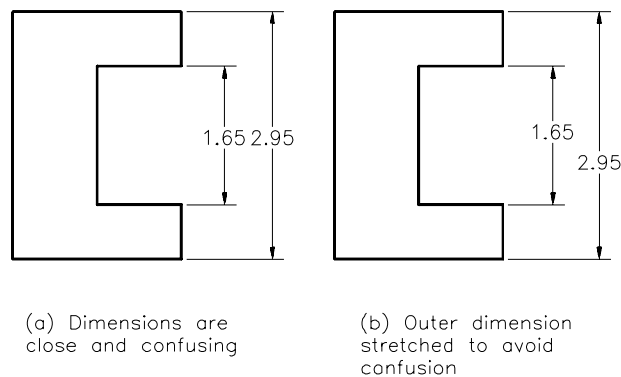


Figure 9-3 Drawing for Exercise 1, stretching dimensions

Editing Dimensions by Trimming and Extending

Trimming and extending operations can be carried out with all types of linear dimensions (horizontal, vertical, aligned, rotated) and the ordinate dimension. Even if the dimensions are true associative, you can trim and extend them. AutoCAD LT trims or extends a linear dimension between the extension line definition points and the object used as a boundary or trimming edge. To extend or trim an ordinate dimension, AutoCAD LT moves the feature

location (location of the dimensioned coordinate) to the boundary edge. To retain the original ordinate value, the boundary edge to which the feature location point is moved should be orthogonal to the measured ordinate. In both cases, the imaginary line drawn between the two extension line definition points is trimmed or extended by AutoCAD LT, and the dimension is adjusted automatically. Figures 9-4 and 9-5 show the dimensions edited by trimming and extending.

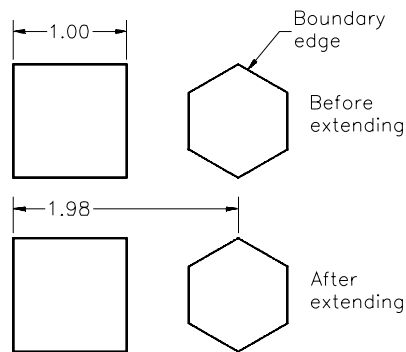


Figure 9-4 Dimensions edited by extending

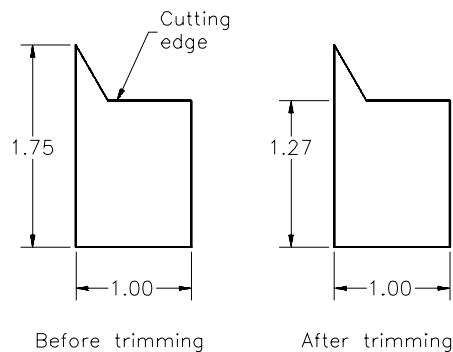


Figure 9-5 Edgemode extended trimming

Exercise 2

Mechanical

Use the **Edgemode > Extend** option of the **TRIM** command to trim the dimension in Figure 9-6(a) so that it looks like Figure 9-6(b).

1. Make the drawing and dimension it as shown in Figure 9-6(a). Assume the dimensions where necessary.
2. Trim the dimensions by setting the **Edgemode** option of the **TRIM** command to **Extend**.

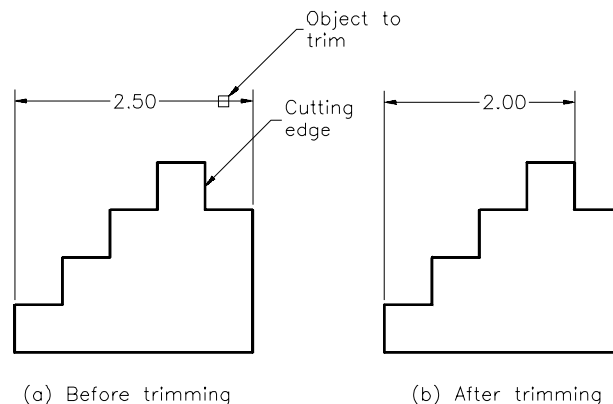


Figure 9-6 Drawing for Exercise 2

Flipping Dimension Arrow

In AutoCAD LT, you can flip the arrowheads individually. To flip the arrow, select the dimension. Place the cursor on the grip corresponding to the arrowhead you want to flip. When the color of the grip turns green, invoke the shortcut menu by right clicking and choose the **Flip Arrow** option from the shortcut menu.

MODIFYING THE DIMENSIONS

Toolbar: Dimension > Dimension Edit
Command: DIMEDIT

The dimension can be modified using the **DIMEDIT** command (Figure 9-7). This command has four options: New, Rotate, Home, and Oblique. The prompt sequence that will follow when you choose this button is

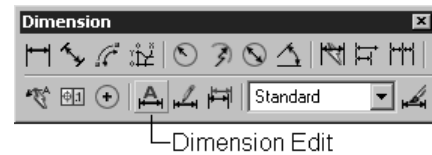


Figure 9-7 Invoking the **DIMEDIT** command from the **Dimension** toolbar

Enter type of dimension editing (Home/New/Rotate/Oblique) <Home>: Enter an option.

New

The **New** option is used to replace the existing dimension with a new text string. When you invoke this option, the **In-Place Text Editor** will be displayed. By default 0.0000 will be displayed. Write the dimension or text string using this **In-Place Text Editor**, with which you want to replace the existing dimension. Once you have written a new dimension in the editor and chosen **OK**, you will be prompted to select the dimension to be changed. Select the dimension; it will be replaced with the new dimension.

Rotate

The **Rotate** option is used to position the dimension text at a specified angle. With this option, you can change the orientation (angle) of the dimension text of any number of associative dimensions. The angle can be specified by entering its value at the **Specify angle for dimension text** prompt or by specifying two points at the required angle. Once you have specified the angle, you will be prompted to select the dimension text to be rotated. You will notice that the text rotates around its middle point, see Figure 9-8.

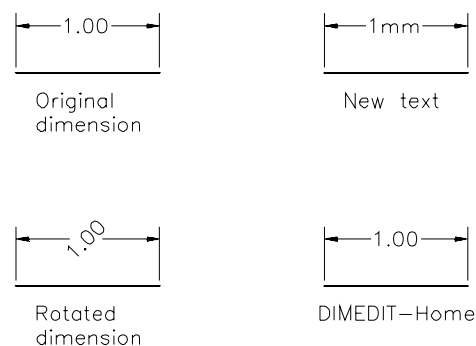


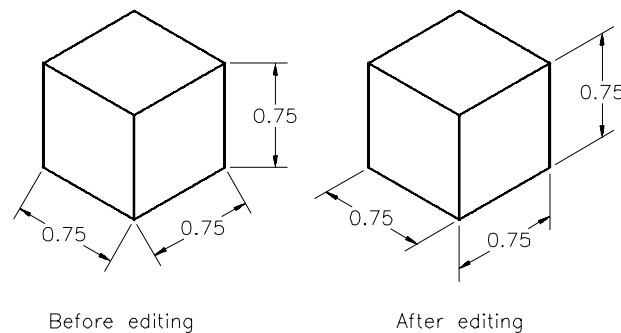
Figure 9-8 Using the **DIMEDIT** command to edit dimensions

Home

The Home option restores the text of a dimension to its original (home/default) location if the position of the text has been changed by stretching or editing, see Figure 9-8.

Oblique

In linear dimensions, extension lines are drawn perpendicular to the dimension line. The **Oblique** option bends the linear dimensions. It draws extension lines at an oblique angle (Figure 9-9). This option is particularly important to create isometric dimensions and can be used to resolve conflicting situations due to the overlapping of extension lines with other objects. Making an existing dimension oblique by specifying an angle oblique to it does not affect the generation of new linear dimensions. The oblique angle is maintained even after performing most editing operations. (See Chapter 21 for details about how to use this option.) When you invoke this option, you will be prompted to select the dimension to be edited. After selecting it you will be prompted to specify the obliquing angle. The extensions lines will be bent at the angle specified. You can also invoke this option by choosing **Oblique** from the **Dimension** menu.



*Figure 9-9 Using the **Oblique** option to edit dimensions*

EDITING DIMENSION TEXT

Toolbar:	Dimension > Dimension Text Edit
Menu:	Dimension > Align Text
Command:	DIMTEDIT



The dimension text can be edited by using the **DIMTEDIT** command. This command is used to edit the placement and orientation of a single existing dimension. You can apply this command, for example, in cases where dimension texts of two or more dimensions are too close together, creating confusion. In such cases, the **DIMTEDIT** command is invoked to move the dimension text to some other location so that there is no confusion. The prompt sequence that will follow when you choose this button is given next.

Select dimension: *Select the dimension to modify.*

Specify new location for dimension text or [Left/Right/Center/Home/Angle]:

Left

With this option, you can left-justify the dimension text along the dimension line. The vertical placement setting determines the position of the dimension text. The horizontally aligned text is moved to the left and the vertically aligned text is moved down, see Figure 9-10. This option can be used only with the linear, diameter, and radius dimensions.

Right

With this option, you can right-justify the dimension text along the dimension line. Similar to the Left option, the vertical placement setting determines the position of the dimension text. The horizontally aligned text is moved to the right, and the vertically aligned text is moved up, see Figure 9-10. This option can be used only with linear, diameter, and radius dimensions.

Center

With this option, you can center-justify the dimension text for linear, and aligned dimensions, see Figure 9-10. The vertical setting controls the vertical position of the dimension text.

Home

The **Home** option is used to restore (move) the dimension text of a dimension to its original (home/default) location if the position of the text has been changed, see Figure 9-10.

Angle

With the Angle option, you can position the dimension text at the angle you specify, see Figure 9-10. The angle can be specified by entering its value at the **Specify angle for dimension text** prompt or by specifying two points at the required angle. You will notice that the text

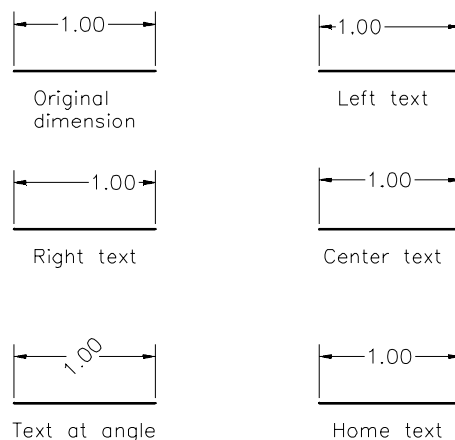


Figure 9-10 Using the **DIMTEDIT** command to edit dimensions

rotates around its middle point. If the dimension text alignment is set to Orient Text Horizontally, the dimension text is aligned with the dimension line. If information about the dimension style is available on the selected dimension, AutoCAD LT uses it to redraw the dimension, or the prevailing dimension variable settings are used for the redrawing process. Entering 0-degree angle changes the text to its default orientation.

UPDATING DIMENSIONS

Toolbar: Dimension > Dimension Update
Menu: Dimension > Update



The **Update** option regenerates and updates the prevailing dimension entities (such as arrows heads and text height) using the current settings for the dimension variables, dimension style, text style, and units. On choosing this button, you will be prompted to select the dimensions to be updated. You can select all the dimensions or specify those that should be updated.

EDITING DIMENSIONS WITH GRIPS

You can also edit dimensions by using the GRIP editing modes. GRIP editing is the easiest and quickest way to edit dimensions. You can perform the following operations with GRIPS.

1. Position the text anywhere along the dimension line. Note that you cannot move the text and position it above or below the dimension line.
2. Stretch a dimension to change the spacing between the dimension line and the object line.
3. Stretch the dimension along the length. When you stretch a dimension, the dimension text automatically changes.
4. Move, rotate, copy, or mirror the dimensions.
5. Relocate a dimension origin.
6. Change properties such as color, layer, linetype, and linetype scale.
7. Load Web browser (if any *Universal Resource Locator* is associated with the object).

EDITING DIMENSIONS USING THE PROPERTIES PALETTE

Toolbar: Standard > Properties
Menu: Modify > Properties
Command: PROPERTIES



You can also modify a dimension or leader by using the **PROPERTIES** palette. The **PROPERTIES** palette is displayed when you choose the **Properties** button from the **Standard** toolbar. It can also be invoked by double-clicking on the dimension to be edited. All the properties of the selected object are displayed in the **PROPERTIES** palette (see Figure 9-11).

PROPERTIES Palette (Dimension)

You can use the **PROPERTIES** palette (Figure 9-11) to change the properties of a dimension, the dimension text style, or geometry, format, and annotation-related features of the selected dimension. The changes take place dynamically in the drawing. The **PROPERTIES** palette provides the following categories for the modification of dimensions as follows.

General

In the general category, the various parameters displayed are **Color**, **Layer**, **Linetype**, **Linetype scale**, **Plot style**, **Lineweight**, **Hyperlink**, and **Associative** with their current values. To change the color of the selected object, select **Color** property and then select the required color from the drop-down list. Similarly, layer, plot style, linetype, and lineweight can be changed from the respective drop-down lists. The linetype scale can be changed manually at the corresponding cell.

Misc

This category displays the dimension style by name (for the **DIMSTYLE** system variable, use **SETVAR**). You can change the dimension style from the drop-down list for the selected dimension.

Lines & Arrows

The various parameters of the lines and arrows in the dimension such as arrowhead size, type, arrow lineweight, and so on can be changed in this category.

Text

The various parameters that control the text in the dimension object such as text color, text height, vertical position text offset, and so on can be changed in this category.

Fit

In the fit category, the various parameters are **Dim line forced**, **Dim line inside**, **Dim scale overall**, **Fit**, **Text inside**, and **Text movement**. All the parameters can be changed by the drop-down list except Dim scale overall (which can be changed manually).

Primary Units

In the primary units category, the parameters displayed are **Decimal separator**, **Dim prefix**, **Dim suffix**, **Dim roundoff**, **Dim scale linear**, **Dim units**, **Suppress leading zeroes**, **Suppress trailing zeroes**, **Suppress zero feet**, **Suppress zero inches**, and **Precision**. Among these properties, Dim units, Suppress leading zeroes, Suppress trailing zeroes, Suppress zero feet, Suppress zero inches, and Precision properties can be changed with the corresponding drop-down lists. The other parameters can be changed manually.

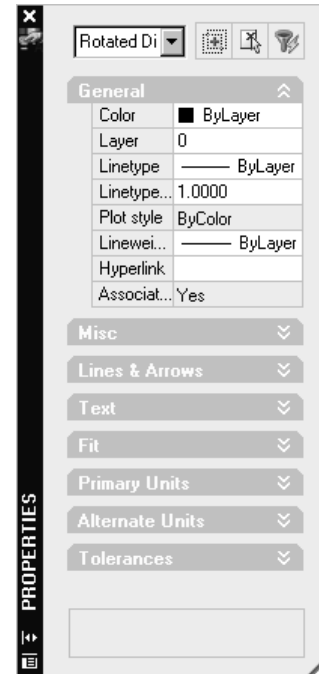


Figure 9-11 **PROPERTIES** palette for dimensions

Alternate Units

Alternate units are required when a drawing is to be read in two different units. For example, if an architectural drawing is to be read in both metric and feet-inches, you can turn the alternate units on. The primary units can be set to metric and the alternate units to architectural. As a result, the dimensions of the drawing will be displayed in metric units as well as in engineering. In the alternate unit category, there are various parameters for the alternate units. They can be changed only if the **Alt enabled** parameter is **on**. The parameters such as **Alt format**, **Alt precision**, **Alt suppress leading zeroes**, **Alt suppress trailing zeroes**, **Alt suppress zero feet**, and **Alt suppress zero inches** can be changed from the respective drop-down lists and others can be changed manually.

Tolerances

The parameters of this category can be changed only if the Tolerances display parameter has some mode of the tolerance selected. The various parameters are available and correspond to the mode of tolerance selected.

PROPERTIES Palette (Leader)

The **PROPERTIES** palette for **Leader** can be invoked by selecting a Leader and then choosing the **Properties** button from the **Standard** toolbar. You can also invoke the **PROPERTIES** palette (Figure 9-12) from the shortcut menu by right-clicking in the drawing area and choosing **Properties**. This palette can also be invoked by double-clicking in the leader to be edited. The various properties under the **PROPERTIES** palette (Leader) are described next.

General

The parameters in the general category are the same as those discussed in the previous section (**PROPERTIES** palette for dimensions).

Geometry

This category displays the coordinates of the Leader. The parameters under this category are **Vertex**, **Vertex X**, **Vertex Y**, and **Vertex Z**. You can choose any vertex of the leader and change its coordinates.

Misc

This category displays the **Dim Style** and **Type** of the Leader. You can change the style name and the type of the Leader by using these properties.

Lines & Arrows

Lines and Arrows displays the various specifications of the arrowheads and linetypes for the Leader.

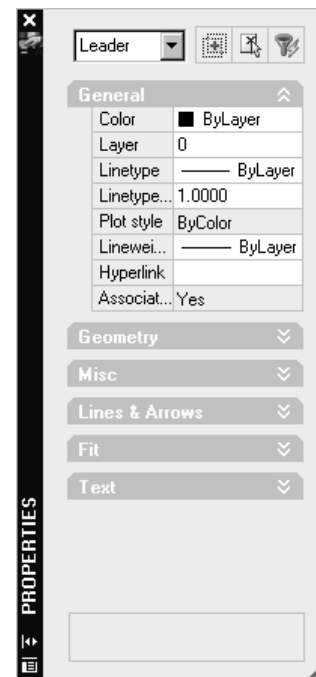


Figure 9-12 **PROPERTIES** palette for leaders

Fit

This category displays the **Dim scale overall** property that specifies the overall scale factor applied to size, distances, or the offsets of the Leader.

Text

Text category displays the **Text offset** to the dimension line and the vertical position (**Text pos vert**) of the dimension text and can be changed accordingly.

Example 2

Mechanical

In this example, you will modify the dimensions in Figure 9-13 so that they match the dimensions given Figure 9-14. Assume the missing dimensions

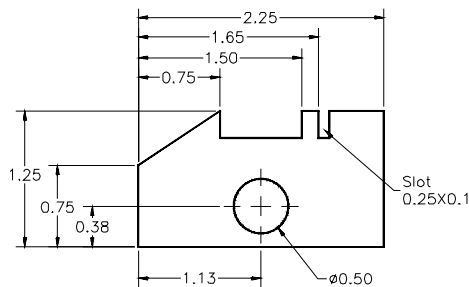


Figure 9-13 Drawing for Example 2

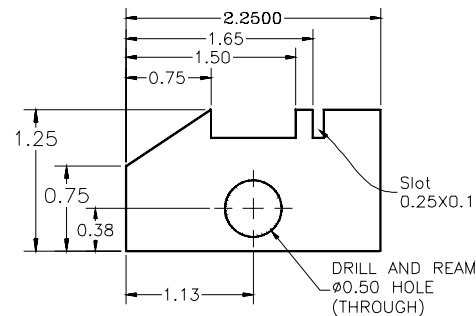


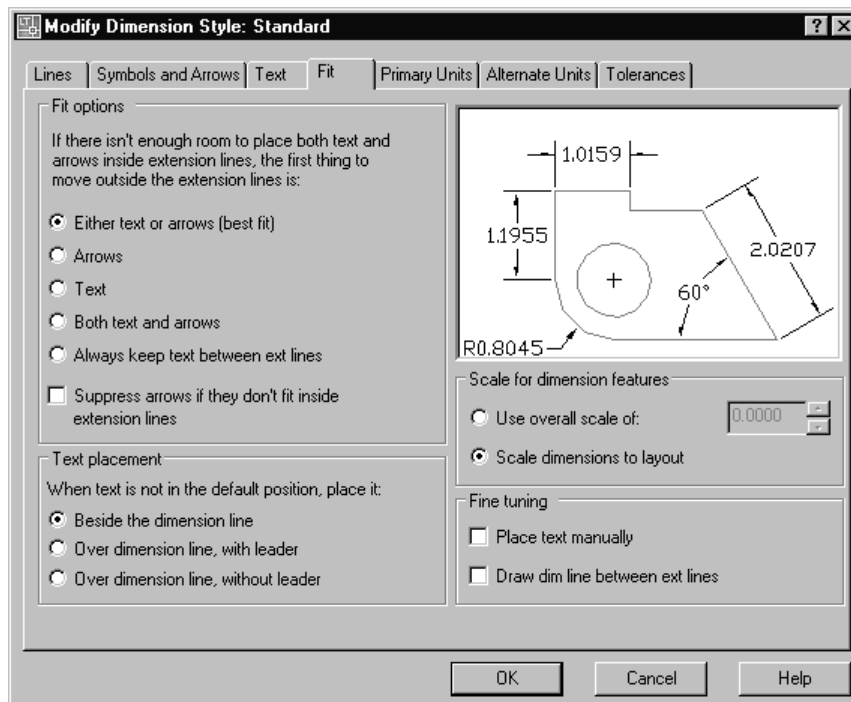
Figure 9-14 Drawing after editing the dimensions

1. Choose **Text Style** from the **Format** menu and create a style with the name **ROMANC**. Select **romanc.shx** as the font for the style.
2. Double-click on the dimension 2.25 to display the **PROPERTIES** palette.
3. In the **Text** category, select the **Text style** drop-down list and then select **ROMANC** style from this drop-down list. The changes will take place dynamically.
4. Select **0.0000** from the **Precision** drop-down list in the **Primary Units** area.
5. Once all the required changes are made in the linear dimension, choose the **Select Object** button in the **PROPERTIES** palette. You will be prompted to select the object. Select the leader line and then press ENTER.
6. The **PROPERTIES** palette will not display the leader options. Select **Spline with arrow** from the **Type** drop-down list in the **Misc** category. The straight line will be converted into a spline with an arrow dynamically.
7. Close the **PROPERTIES** palette.

8. Choose the **Dimension Edit** button from the **Dimension** toolbar. Enter **N** in the prompt sequence to display the **In-Place Text Editor**.
9. Enter **DRILL AND REAM %%C0.25 HOLE (THROUGH)** in the text editor and then choose **OK**.
10. You will be prompted to select the object to be changed. Select the diameter dimension and then press **ENTER**. The diameter dimension will be modified to the new value.

MODEL SPACE AND PAPER SPACE DIMENSIONING

Dimensioning objects can be drawn in the model space or paper space. If the drawings are in model space, associative dimensions should also be created in it. If the drawings are in the model space and the associative dimensions are in the paper space, the dimensions will not change when you perform such editing operations as stretching, trimming, and extending, or such display operations as zoom and pan in the model space viewport. The definition points of a dimension are located in the space where the drawing is drawn. You can select the **Scale dimensions to layout (paperspace)** radio button under the **Scale for Dimension Features** area in the **Fit** tab of the **Modify, New, or Override** dialog boxes in the **Dimension Style Manager** dialog box, depending on whether you want to modify the present style or you want to create a new style (see Figure 9-15). Choose **OK/OK** to exit from both the dialog boxes. AutoCAD LT calculates a scale factor that is compatible with the model space and the



*Figure 9-15 Selecting paper space scaling in the **Modify Dimension Style** dialog box*

paper space viewports. Choose **Update** from the **Dimension** menu and select the dimension objects for updating.

The drawing shown (Figure 9-16) uses paper space scaling. The main drawing and detail drawings are located in different floating viewports (paper space). The zoom scale factors for these viewports are different: 0.3XP, 1.0XP, and 0.5XP, respectively. When you use paper space scaling, AutoCAD LT automatically calculates the scale factor for dimensioning so that the dimensions are uniform in all the floating viewports (model space viewports).

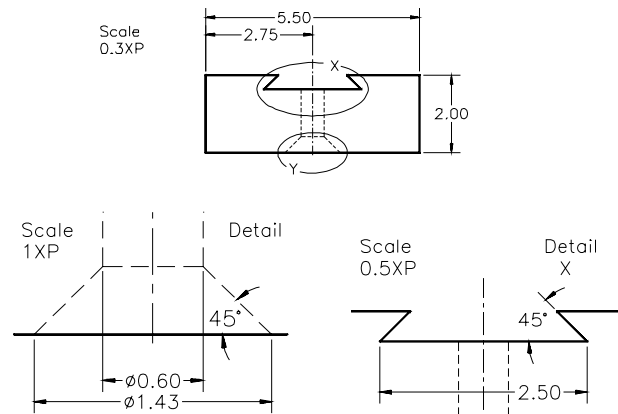


Figure 9-16 Dimensioning in paper model space viewports using paper space scaling or setting **DIMSCALE** to 0

Self-Evaluation Test

Answer the following questions and then compare your answers to those given at the end of this chapter:

1. In associative dimensioning, the items constituting a dimension (such as dimension lines, arrows, leaders, extension lines, and dimension text) are drawn as a **single object**. (T/F)
2. If the value of the variable **DIMDASSOC** is set to zero, the dimension lines, arrows, leaders, extension lines, and dimension text are drawn as **independent** objects. (T/F)
3. You cannot edit dimensions using grips. (T/F)
4. The true associative dimensions cannot be trimmed or extended. (T/F)
5. You can use the _____ command to break the dimensions into individual entities.
6. The _____ option of the **DIMEDIT** command is used to justify the dimension text toward the left side.

7. The _____ option of the **DIMEDIT** command is used to justify the dimension text to the center of the dimension.
8. The _____ option of the **DIMEDIT** command is used to create a new text string.
9. The _____ option of the **DIMEDIT** command is used to bend the extension lines through the specified angle.
10. The _____ button from the **Dimension** toolbar is used to update the dimensions.

Review Questions

Answer the following questions:

1. The horizontal, vertical, aligned, and rotated dimensions cannot be edited using the grips. (T/F)
2. Trimming and extending operations can be carried out with all types of linear (horizontal, vertical, aligned, and rotated) dimensions and with the ordinate dimension. (T/F)
3. To extend or trim an ordinate dimension, AutoCAD LT moves the feature location (location of the dimensioned coordinate) to the boundary edge. (T/F)
4. Once moved from the original location, the dimension text cannot be restored to its original position. (T/F)
5. With the _____ or _____ commands, you can edit the dimension text.
6. The _____ command is particularly important for creating isometric dimensions and is applicable in resolving conflicting situations due to overlapping of extension lines with other objects.
7. The _____ command is used to edit the placement and orientation of a single existing dimension.
8. The _____ command regenerates (updates) prevailing associative dimension objects (like arrows and text height) using the current settings for the dimension variables, dimension style, text style, and units.
9. Explain when to use the **EXTEND** command and how it works with dimensions.
_____.
10. Explain the use and working of the **PROPERTIES** command for editing dimensions.
_____.

Exercises

Exercise 3

General

1. Create the drawing shown in Figure 9-17. Assume the dimensions where necessary.
2. Dimension the drawing, shown in Figure 9-17.
3. Edit the dimensions so that they match the dimensions shown in Figure 9-18.

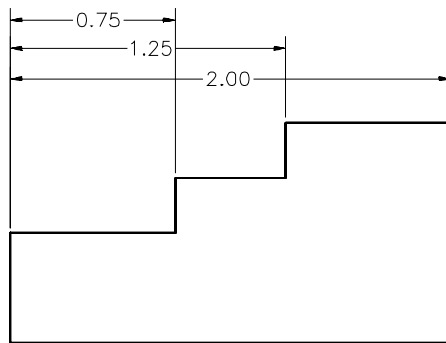


Figure 9-17 Drawing for Exercise 3, before editing dimensions

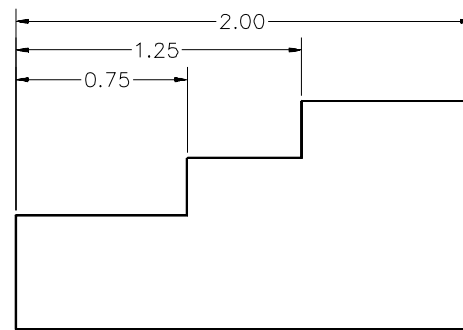


Figure 9-18 Drawing for Exercise 3, after editing dimensions

Exercise 4

Mechanical

1. Draw the object shown in Figure 9-19(a). Assume the dimensions where necessary.
2. Dimension the drawing, as shown in Figure 9-19(a).
3. Edit the dimensions so that they match the dimensions shown in Figure 9-19(b).

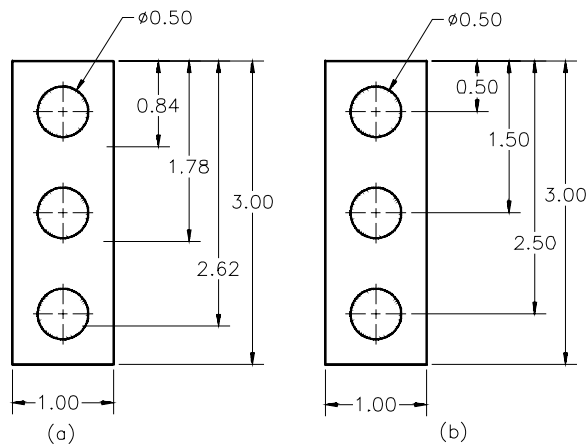


Figure 9-19 Drawings for Exercise 4

Exercise 5*Architectural*

Create the drawing shown in Figure 9-20 and then dimension it. Assume the dimensions wherever necessary. After dimensioning the drawing, edit them so that they match the dimensions shown in Figure 9-20

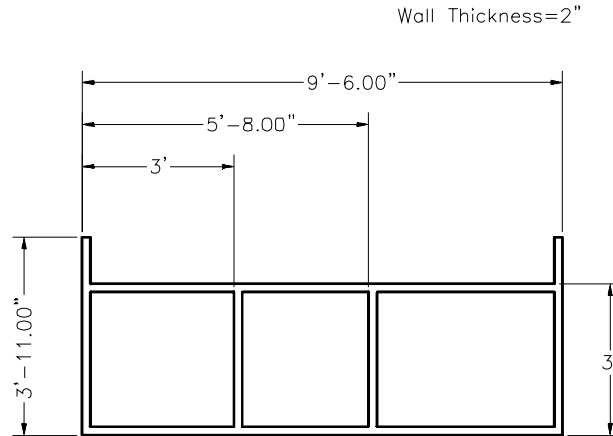


Figure 9-20 Drawing for Exercise 5

Problem-Solving Exercise 1*Mechanical*

Create the drawing in Figure 9-21 and then dimension it as shown. Edit the dimensions so that they are positioned as shown in the drawing. You may change the dimension text height and arrow size to 0.08 units.

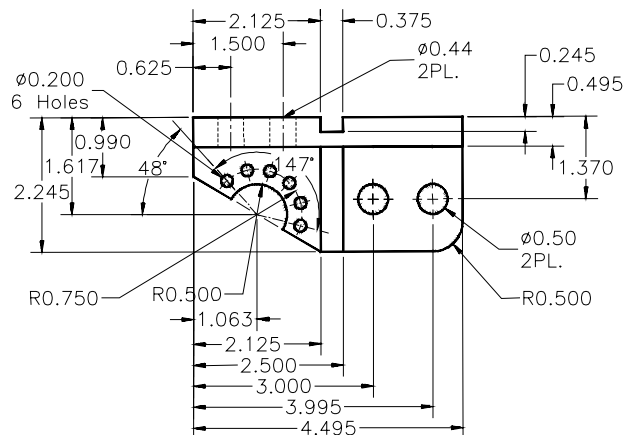


Figure 9-21 Drawing for Problem Solving Exercise 1

Problem-Solving Exercise 2*Mechanical*

Draw the front and side view of an object shown in Figure 9-22 and then dimension the two views. Edit the dimensions so that they are positioned as shown in the drawing. You may change the dimension text height and arrow size to 0.08 units.

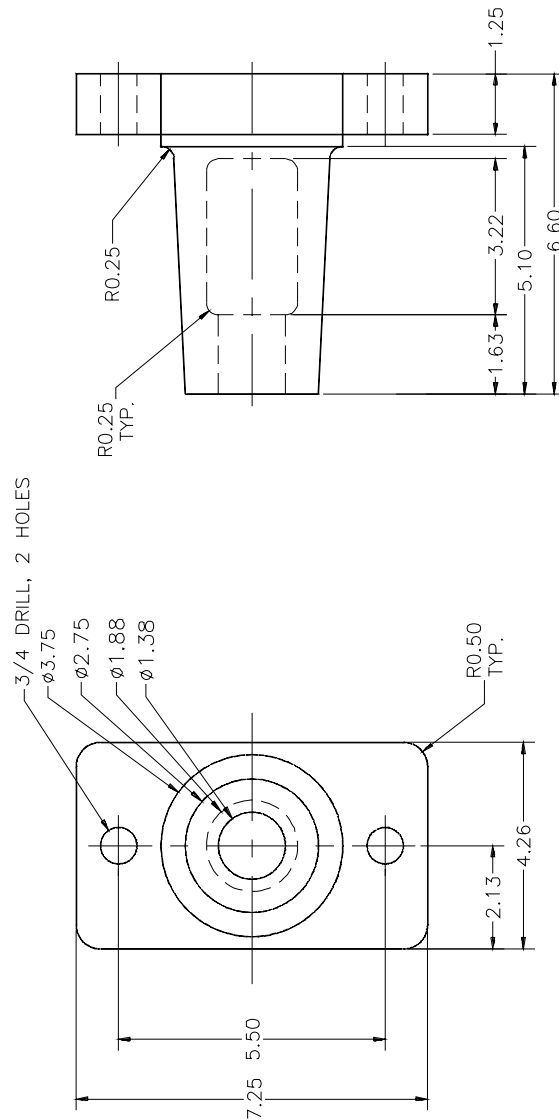


Figure 9-22 Drawing for Problem Solving Exercise 2

Problem-Solving Exercise 3

Architectural

Create the drawing of the floor plan shown in Figure 9-23 and then give the dimensions as shown. Edit the dimensions, if needed, so that they are positioned as shown in the drawing.

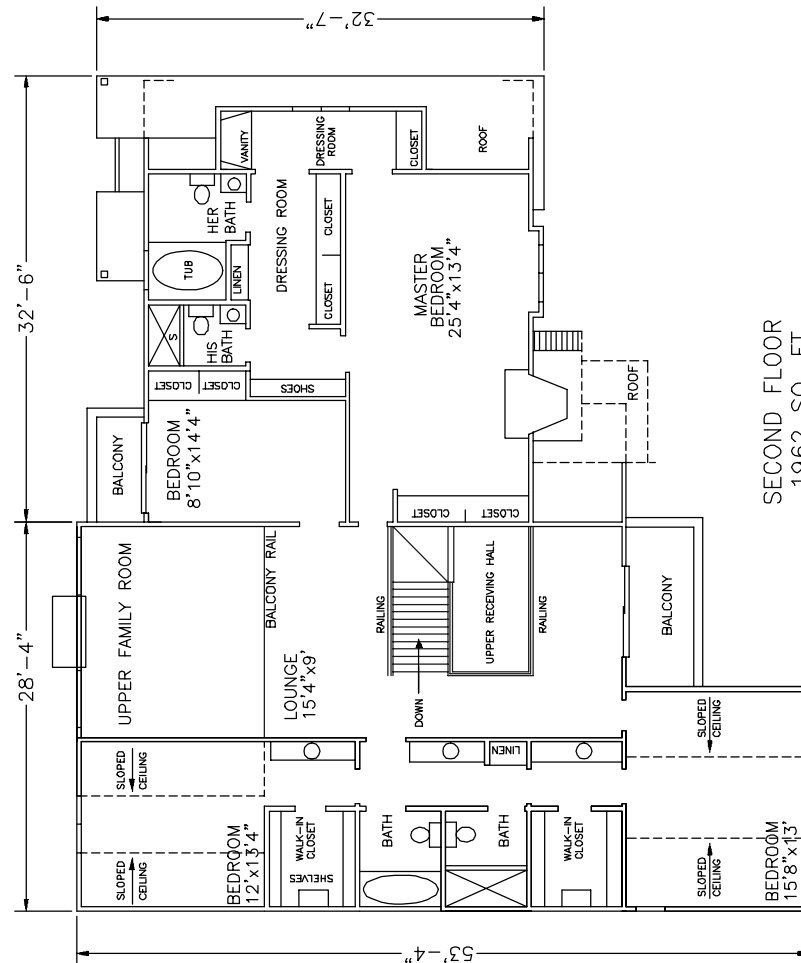


Figure 9-23 Drawing for Problem Solving Exercise 3

Answers to Self-Evaluation Test

1 - T, 2 - T, 3 - F, 4 - F, 5 - EXPLODE, 6 - Left, 7 - Center, 8 - New, 9 - Oblique, 10 - Dimension Update