NAMAL UNIVERSITY, MIANWALI

Department of Electrical Engineering

EE-254– Engineering Drawing

Lab – 7

Dimension and Annotation of AutoCAD 2016

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Document History

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1.0	02-2022	Initial Draft	MB
1.1	05-2023	Revision	RS

Course Learning Outcomes

CLO1: Describe and report basic engineering drawing problems.

CLO3: Reproduce 2-D and 3-D sketches using AutoCAD by applying engineering drawing principles.

Equipment

- Software
  - AutoCAD 2023 electrical

Instructions

The following instructions are to be followed while performing in the labs.

- The manual must be thoroughly read before starting the lab.
- The theoretical concepts related to the lab and experiments must be revised.
- All attempts shall be made to complete the lab during the lab session.
- Any attempt to plagiarize from any source will be reported to the disciplinary committee for further action, so keep the work original.
- Carefully use the laboratory equipment.

Objectives

- To get hands on experience of AutoCAD software.

Background Information

Basic drawing tools are used to create some simple drawings. However, to create complex drawings, we require different dimensions and annotations to describe the drawing parameters.

Dimension and Annotation Tools

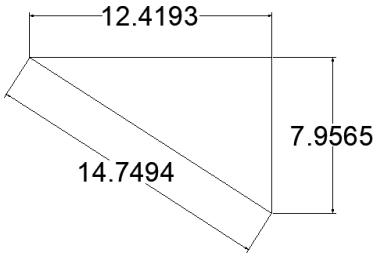
There are many dimensions and annotation tools available in the AutoCAD software. These tools can be accessed from annotation panel under home tab in the ribbon of AutoCAD software/ command line.

Create Dimensions

The **dimension tool** is used to create dimensions depending upon the dimension type selected. Its procedure is given below:

- This tool can be accessed from **annotation** panel under **home** tab in the **ribbon** or command line by typing **DIM** command.
- To access it from **ribbon**, one needs to set the dimension type before activating it, i.e., **linear**, **aligned**, **angular**, **diameter**, **radius**, **arc length**, **ordinate** and **jogged**.
- After selecting dimension type, click on dimension icon to activate it.

- The activation of dimension tool will prompt the user to select an object.
- Select object and click to create the dimension.



- Press **enter** to terminate the process.
- Type **DIM** in the command line it will prompt the user to select type of dimension, select type and press enter to go to next step.
- Select object and click to create the dimension.

- Press **Enter** to terminate the operation.
- By typing **DIM** command in the command line, one needs to enter the type of dimension as well.
- **DLI**: it is used for creating **horizontal** and **vertical** dimensions.
- **DAL**: it is used for creating linear dimension parallel to the object.
- **DAR**: it is used for creating arc length dimension.
- **DDI**: it is used for creating diameter dimensions.
- **DRI**: it is used for creating radius dimensions.
- **DCO**: it creates a linear dimension from the second extension line of the previous dimension.
- **DBA**: it creates dimension by using the previously created dimension.
- **DAN**: it is used for creating angular dimension.
- **DCE**: it is used for creating center mark to a circle or an arc.
- **QDIM**: it is used for creating one or more dimensions simultaneously. Type this command and select multiple objects. It will create dimensions for each object simultaneously.

Creating a Dimension Style

The appearance of the dimensions depends on the dimension style that is set. One can create customized dimension style by varying values and types of different variables using dimension style manager dialog. This dialog can be accessed by clicking on **annotation panel** name then **dimension style** tab and finally **manage dimension style** or simply click on the dimension style icon after clicking on the annotation panel name. The dialog can also be accessed using **DIMSTYLE** command. The dialog is shown in Fig. 1.

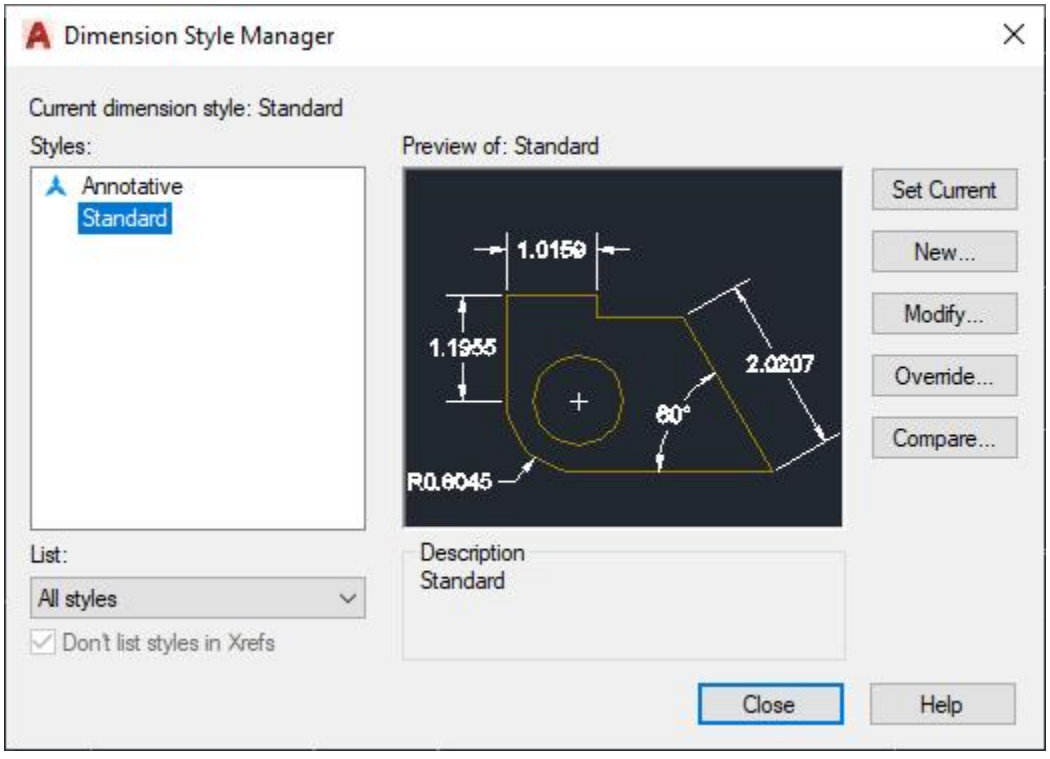


Figure 1: Dimension style dialog.

The basic nomenclature of dimensions is shown in Fig. 2.

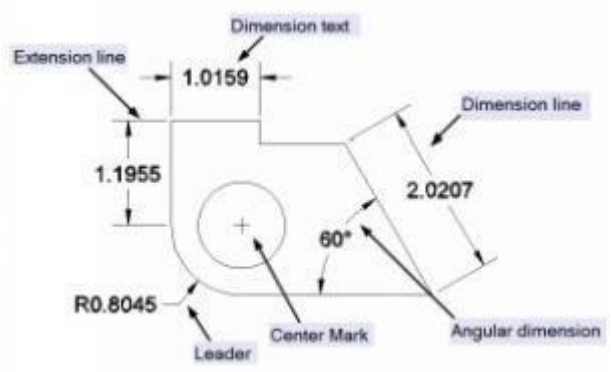
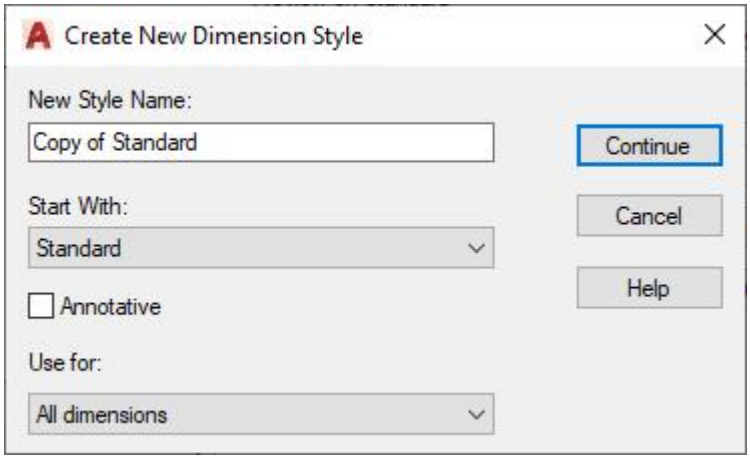


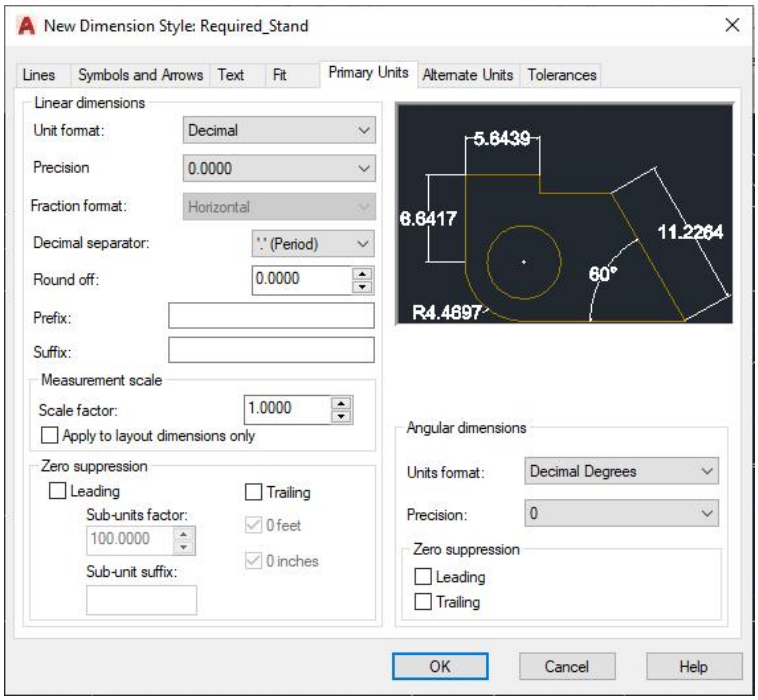
Figure 2: Basic nomenclature of dimensions.

By default, the ISO-25 or the standard dimension style is active. If the default dimension style does not suit the dimensioning requirements, one can create a new dimension style:

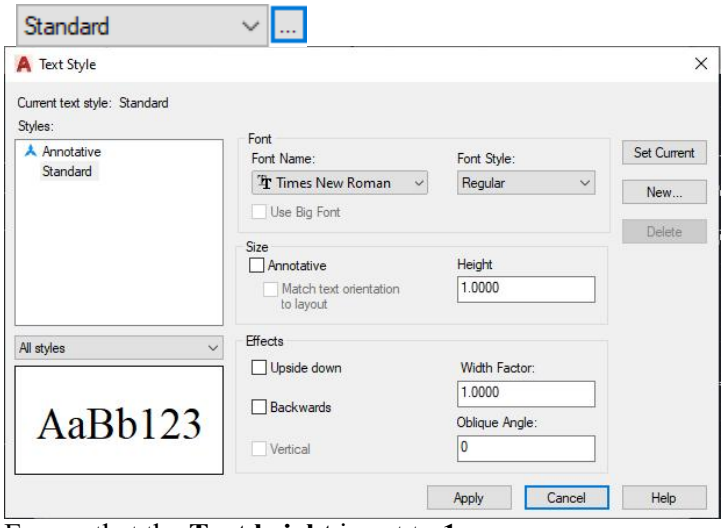
- To create a new dimension style, click the **New** button on the dimension style manager dialog; create new dimension style dialog appears.



- Enter style name and other options as required in the above dialog.
- Enter style name start with (Standard or ISO-25) and use for (All dimensions or according to the requirements) and press continue button.
- In the *New* **Dimension Style** dialog, click the **Primary Units** tab.



- Ensure that the **Unit Format** is set to **Decimal.**
- Set **Precision** to **0.00**.
- Select **Decimal separator** *'.'* (period).
- Same as above set other options as required, most of them are self-explanatory.
- Click the **text tab**.
- Select text style standard and click on the icon available on the right corner of the below image. By clicking on this icon, a new dialog will appear where one can set font name, font style, and text height etc.



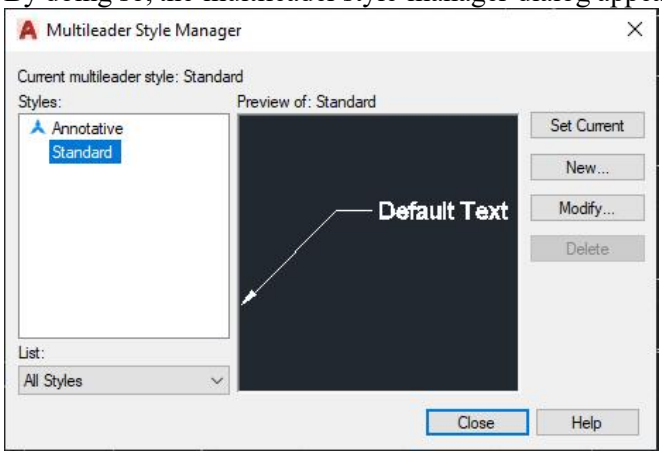
- Ensure that the **Text height** is set to **1**.
- Set current and press **Apply button**.
- In the text placement section, set the **Vertical** and **Horizontal** values to **Centered** in the **text** tab of
- **New Dimension Style Manager**.
- Set the **text alignment** to **Horizontal.**

- Click the **lines** tab on the dialog.
- In this tab, notice the options in the extension lines section: **Extend beyond dim lines** and **offset from origin**
- Set **Extend beyond dim lines** and **offset from origin** to **1.25.**
- Set the **Baseline spacing** in the Dimension lines section to **5**.
- Click the **Symbols and Arrows** tab and set **Arrow size** to **3** and **Center Marks** to **3**.
- Click *OK* to accept the settings.
- Click **Set Current** on the **Dimension Style Manager** dialog; the new dimensional style will be set as current.
- Click **Close** to close the dialog.

Adding Leaders

A **Leader** is a thin solid line terminating with an arrowhead at one end and a dimension, note or symbol at the other end. For creating leaders in AutoCAD, its procedure is given below:

- Click on the multileader style in the annotation panel under home tab in the ribbon of AutoCAD.
- By doing so, the multileader style manager dialog appears.



- In the multileader style dialog, click the new button; then create new multileader style dialog appears.
- In the **Create New Multileader Style** dialog, enter '**name**' in the new style name box and select **Standard** from the start with drop-down menu.
- Click **continue***;* the **New Multileader Style dialog** appears.
- Click the **Leader Format** tab and set the **Arrowhead Size** to **2.5**.
- Study other options, these are self-explanatory.
- Click the **Leader Structure** tab and set the **Landing Distance** *to* **5**.
- Click the **Content** tab and set the **Text height** to **2.5**.
- Study other options in this tab, these are self-explanatory.
- Click **OK** on the **Modify Multileader Style Manager** dialog.
- Click **Close** to close the dialog.

Adding Dimensional Tolerances

Accuracy of a part is an important factor during manufacturing processes. However, it is impossible to manufacture a part with the exact dimensions. Therefore, while applying dimensions to a drawing we provide some dimensional tolerances, which lie within acceptable limits. The procedure for tolerances setting are given below:

- Create a new dimension style with the name **Tolerances.**
- In the **Tolerances tab**, set the **Method** as **Deviation**.
- Set **precision** *as* **0.00**.
- Set the upper value and Lower Value to **0.05**.
- Set the vertical position as middle.
- Specify the following settings in the primary units, text, and symbols and arrows tab:

Primary Units

Unit format: Decimal
Precision: 0.00
Decimal Separator: '**.**'

Text

Text height: 2.5
Text placement: Centered
Text alignment: Horizontal

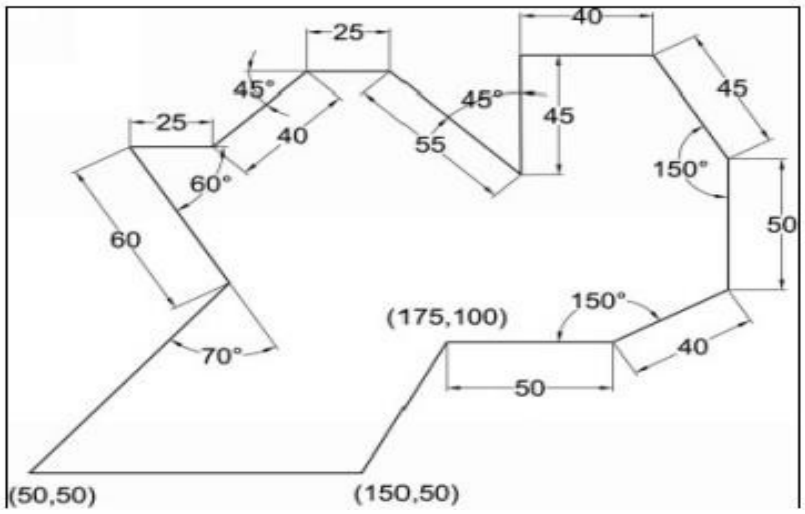
Symbols and Arrows

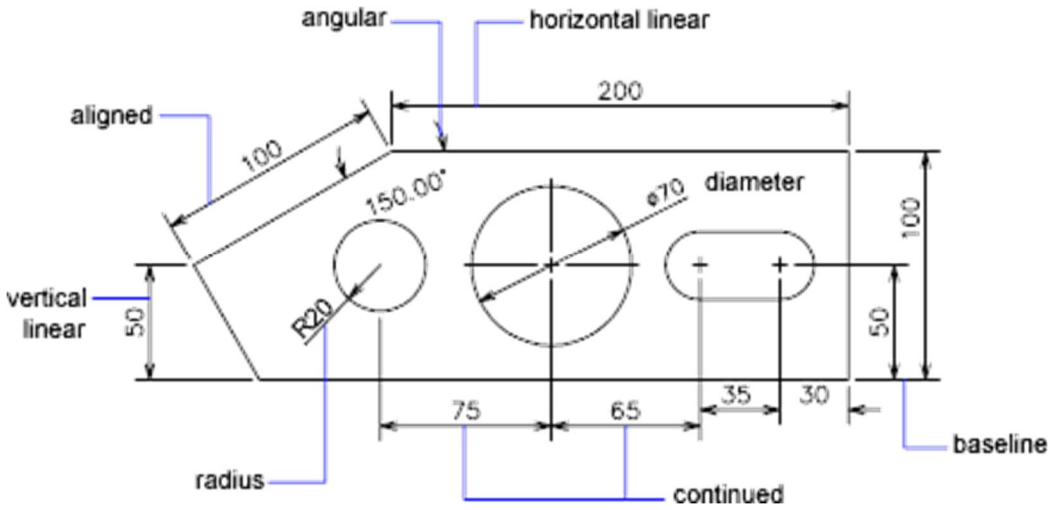
Arrow size: 2.5
Center Marks: Line

- Click OK on New Dimension Styles dialog.
- Click Set Current and Close the Dimension Style Manager dialog.

Task

Draw the drawing as shown below. Also, write the procedure aided with the command sequence.

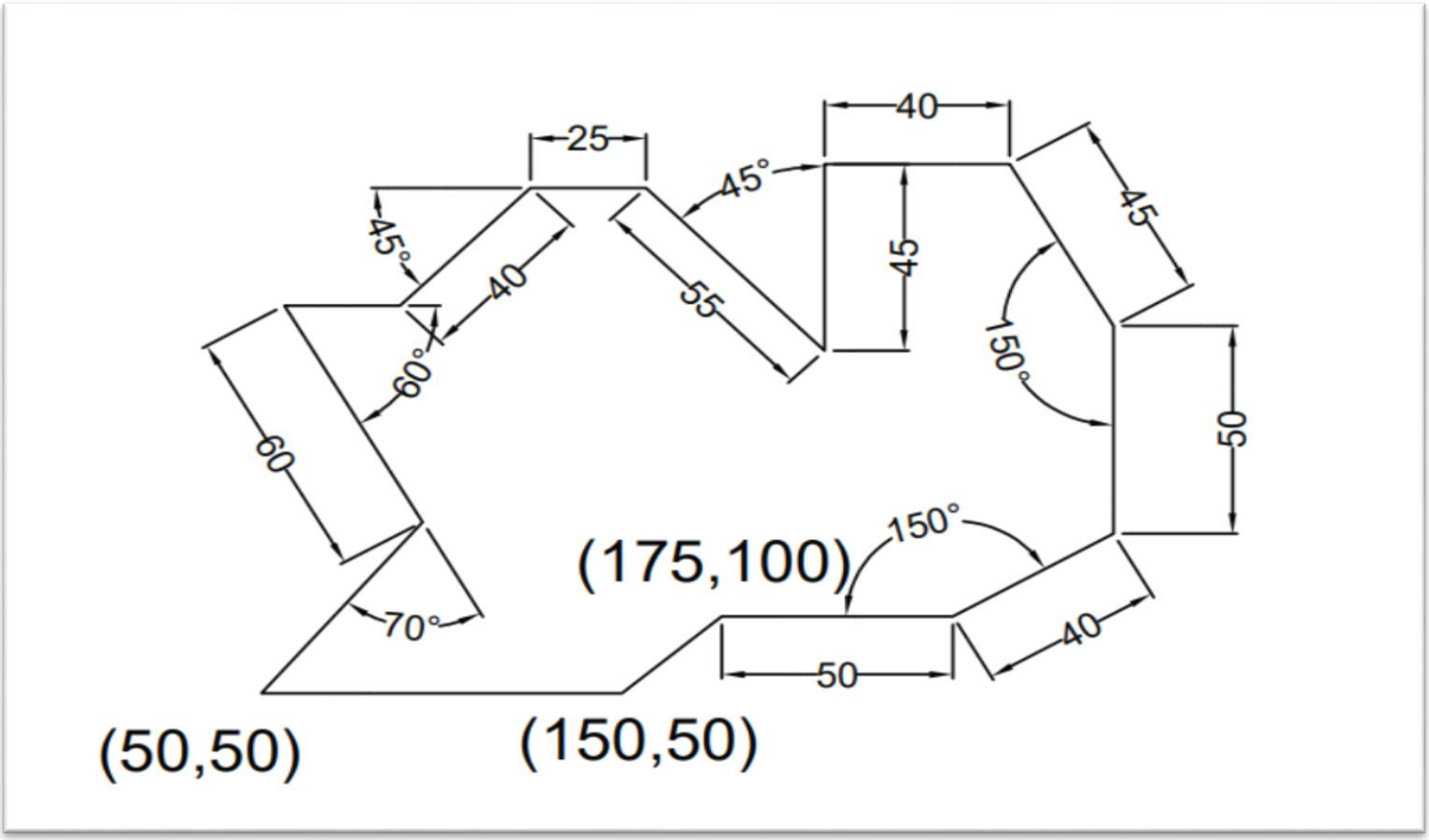




(Open-ended)

Create drawing of your own choice, do all changes given in the manual for your own drawing.

Task 1



Procedure:

- Select the initial line start points (175,100) give length 50
- Draw another line of 40 with angle 150 to the previous line
- Draw perpendicular line of 50 units
- Draw other lines of 45 with angle 150 to the previous line
- Draw horizontal 40-unit line
- Draw vertically downward 40-unit line
- Draw another line of 55 with angle 45 to the previous line
- Draw horizontal 25-unit line
- Draw another line of 40 with angle 45 to the previous line
- Draw horizontal line of 20 unit
- Draw another line of 60 with angle 60 to the previous line
- Draw another line start from the end of previous line and end at (50,50) with width angle 45 to the previous line
- Extend the previous line to the point (150,50)
- Extend the previous line to the point (175,100)
- After drawing the figure measure all the dimensions

Commands:

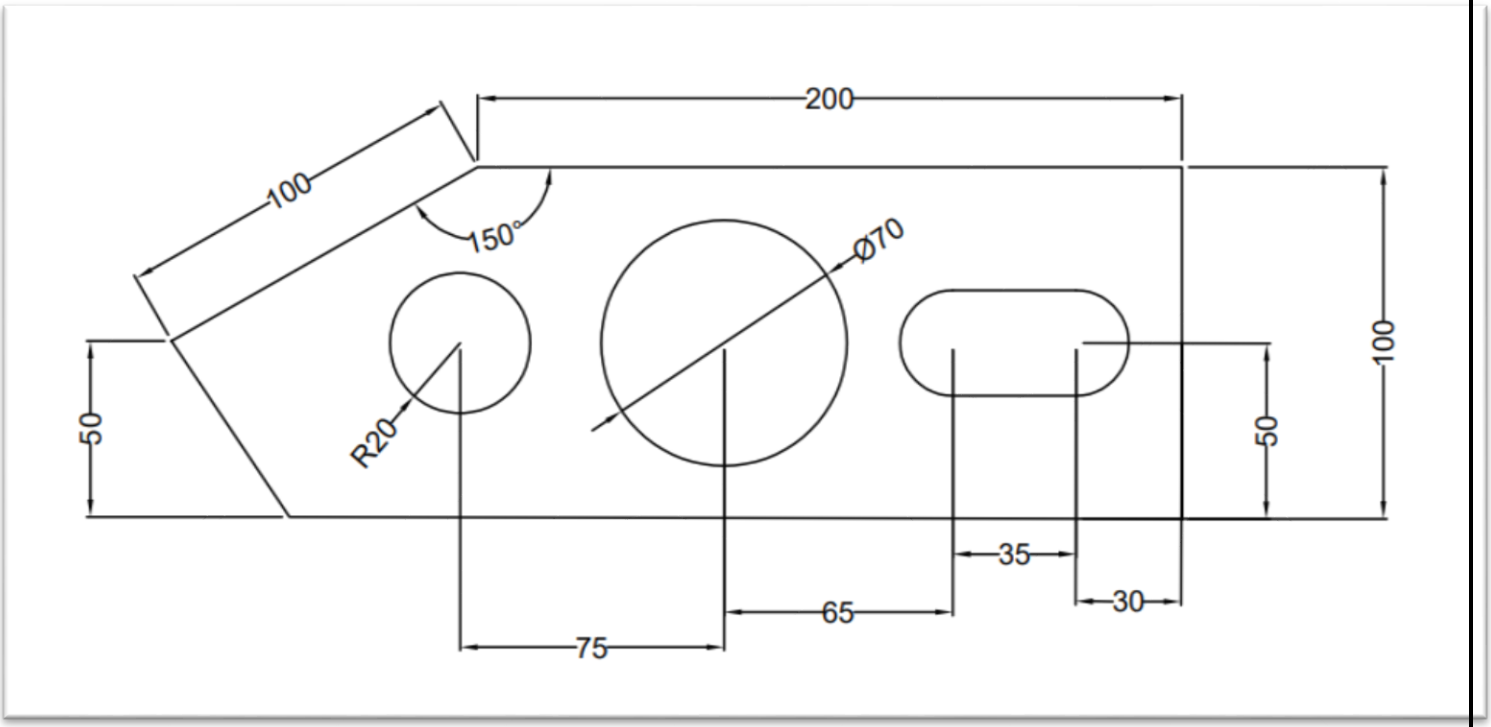
Command: '_pan
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Command: DIM
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Non-associative dimension created.
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Automatic save to C:\Users\ADMINI~1\AppData\Local\Temp\LAB_07_1_6588_20c5df90.sv$ ...
Command:
Command: DIM
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command: DIMANGULAR

Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Non-associative dimension created.
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command: DST
DIMSTYLE
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: DIMSTYLE
Command: DIMSTYLE
Command: '_pan
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: DIMSTYLE
Command: _dimangular
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 60
Command: *Cancel*
Command: DIMANGULAR
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 45
Command:
Command: *Cancel*
Specify start point of text or [Justify/Style]:
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 45
Command: DIMANGULAR
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 150
Command: *Cancel*
Automatic save to C:\Users\ADMINI~1\AppData\Local\Temp\LAB_07_1_6588_20c5df90.sv$ ...
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: *Cancel*
Command: DIMANGULAR
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 150
Command: *Cancel*
Command: DIMANGULAR
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]:
Dimension text = 70
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command: _mleader
Specify leader arrowhead location or [leader Landing first/Content first/Options] <Options>: *Cancel*
Command: _mleader
Specify leader arrowhead location or [leader Landing first/Content first/Options] <Options>:
Specify leader landing location:
Command: _.erase 1 found
Command: T
MTEXT
Current text style: "Standard" Text height: 0.2000 Annotative: No
Specify first corner:
Specify opposite corner or [Height/Justify/Line spacing/Rotation/Style/Width/Columns]:
Command: TEXT
Current text style: "Standard" Text height: 0.2000 Annotative: No Justify: Left
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:

Specify height <0.2000>:
Specify rotation angle of text <0>:
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: _textedit
Current settings: Edit mode = Multiple
Select an annotation object or [Undo/Mode]:
Select an annotation object or [Undo/Mode]:
Select an annotation object or [Undo/Mode]: *Cancel*
Command: *Cancel*
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: *Cancel*
Current settings: Edit mode = Multiple
Select an annotation object or [Undo/Mode]: *Cancel*
Command:
Command: _qsave
Command: _text
Current text style: "Standard" Text height: 10.0000 Annotative: No Justify: Left
Specify start point of text or [Justify/Style]:
Specify height <10.0000>:

Command:
Command: _text
Current text style: "Standard" Text height: 10.0000 Annotative: No Justify: Left
Specify start point of text or [Justify/Style]: *Cancel*
Current text style: "Standard" Text height: 10.0000 Annotative: No Justify: Left
Specify start point of text or [Justify/Style]:
Specify height <10.0000>:
Value must be positive and nonzero.
Specify height <10.0000>:
Specify rotation angle of text <0>:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: *Cancel*
Command: LAYOUT
Enter layout option [Copy/Delete/New/Template/Rename/SAveas/Set/?] <set>:
Enter layout to make current <Layout1>: n
Command:
Command: _PLOT Effective plotting area: 8.50 wide by 3.05 high
Plotting viewport 2.
Automatic save to C:\Users\ADMINI~1\AppData\Local\Temp\LAB_07_1_29770_0e922090.sv$ ...
Command:

Task 2



Procedure:

- Draw a line of 75 units and draw two circles on its ends one of radius 20 and other diameter 70 and trim the line.
- Draw a line of 65 units to the previous line and draw another line of 35 units, trim the previous line
- Make the offset of the line and draw circles on its ends and trim the unwanted area
- Draw a line of 100 units, then another of 200 units, then another of 100 units with angle 150 then of 50 and then join end line to first line.
- Draw all the dimensions of the lines, angles, and circles

Commands:

AutoCAD menu utilities loaded. AutoCAD Electrical menu utilities loaded.*Cancel* Command: Autodesk DWG. This file is a TrustedDWG last saved by an Autodesk application or Autodesk licensed application. Command: Command: Command: '_pan Press ESC or ENTER to exit, or right-click to display shortcut menu. Command: L LINE Specify first point: Specify next point or [Undo]: 75 Specify next point or [Undo]: 50	Command: Command: Command: _circle Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: Specify radius of circle or [Diameter] <35.0000>: Command: CIRCLE Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: Specify radius of circle or [Diameter] <15.0000>: Command: TR TRIM Current settings: Projection=UCS, Edge=None, Mode=Quick Select object to trim or shift-select to extend or [cuTting edges/Crossing/mOde/Project/eRase]: Select object to trim or shift-select to extend or [cuTting edges/Crossing/mOde/Project/eRase/Undo]:

Specify next point or [Close/Undo]: 65
Specify next point or [Close/Undo]: *Cancel*
Command: C
CIRCLE
Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:
Specify radius of circle or [Diameter]: 20
Command: CIRCLE
Specify center point for circle or [3P/2P/Ttr (tan tan radius)]:
Specify radius of circle or [Diameter] <20.0000>: d
Specify diameter of circle <40.0000>: 70
Command:
Command: _.erase 1 found
Command:
Command: _.erase 1 found
Command: L
LINE
Specify first point:
Specify next point or [Undo]: 65
Specify next point or [Undo]: 35
Specify next point or [Close/Undo]: *Cancel*
Command:
Command: _.erase 1 found
Command: O
OFFSET
Current settings: Erase source=No Layer=Source
OFFSETGAPTYPE=0
Specify offset distance or [Through/Erase/Layer] <Through>: 15
Select object to offset or [Exit/Undo] <Exit>:
Specify point on side to offset or [Exit/Multiple/Undo] <Exit>:
Select object to offset or [Exit/Undo] <Exit>:
Specify point on side to offset or [Exit/Multiple/Undo] <Exit>:
Select object to offset or [Exit/Undo] <Exit>: *Cancel*
Command: C
CIRCLE
Specify center point for circle or [3P/2P/Ttr (tan tan radius)]: 3p
Specify first point on circle:
Specify second point on circle:
Specify third point on circle: *Cancel*
** STRETCH **
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or
[Mtext/Text/Angle/Quadrant]:
Dimension text = 90
Command: DIMANGULAR
Select arc, circle, line, or <specify vertex>:
Select second line:
Specify dimension arc line location or
[Mtext/Text/Angle/Quadrant]: *Cancel*
Command:
Command: *Cancel*
Command: *Cancel*
Command: *Cancel*
Command:
Command: _.erase 1 found
Command: L
LINE
Specify first point:

Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]: *Cancel*
Command: L
LINE
Specify first point:
Specify next point or [Undo]: 30
Specify next point or [Undo]: 50
Specify next point or [Close/Undo]: 100
Specify next point or [Close/Undo]: 200
Specify next point or [Close/Undo]: *Cancel*
Command: LINE
Specify first point:
Specify next point or [Undo]: 100
Specify next point or [Undo]: 50
Specify next point or [Close/Undo]:
Specify next point or [Close/Undo]: *Cancel*
Command:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:*Cancel*
Command: *Cancel*
Command:
Command: _.erase 1 found
Specify stretch point or [Base point/Copy/Undo/eXit]:
** LENGTHEN **
Specify end point:*Cancel*
Command: Specify opposite corner or
[Fence/WPolygon/CPolygon]: *Cancel*
Command: _dimangular
Command:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: Specify opposite corner or
[Fence/WPolygon/CPolygon]: *Cancel*
Command: *Cancel*
Command:
Command:
Command: _dim
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle
[Mtext/Text/text aNgle/Undo]:

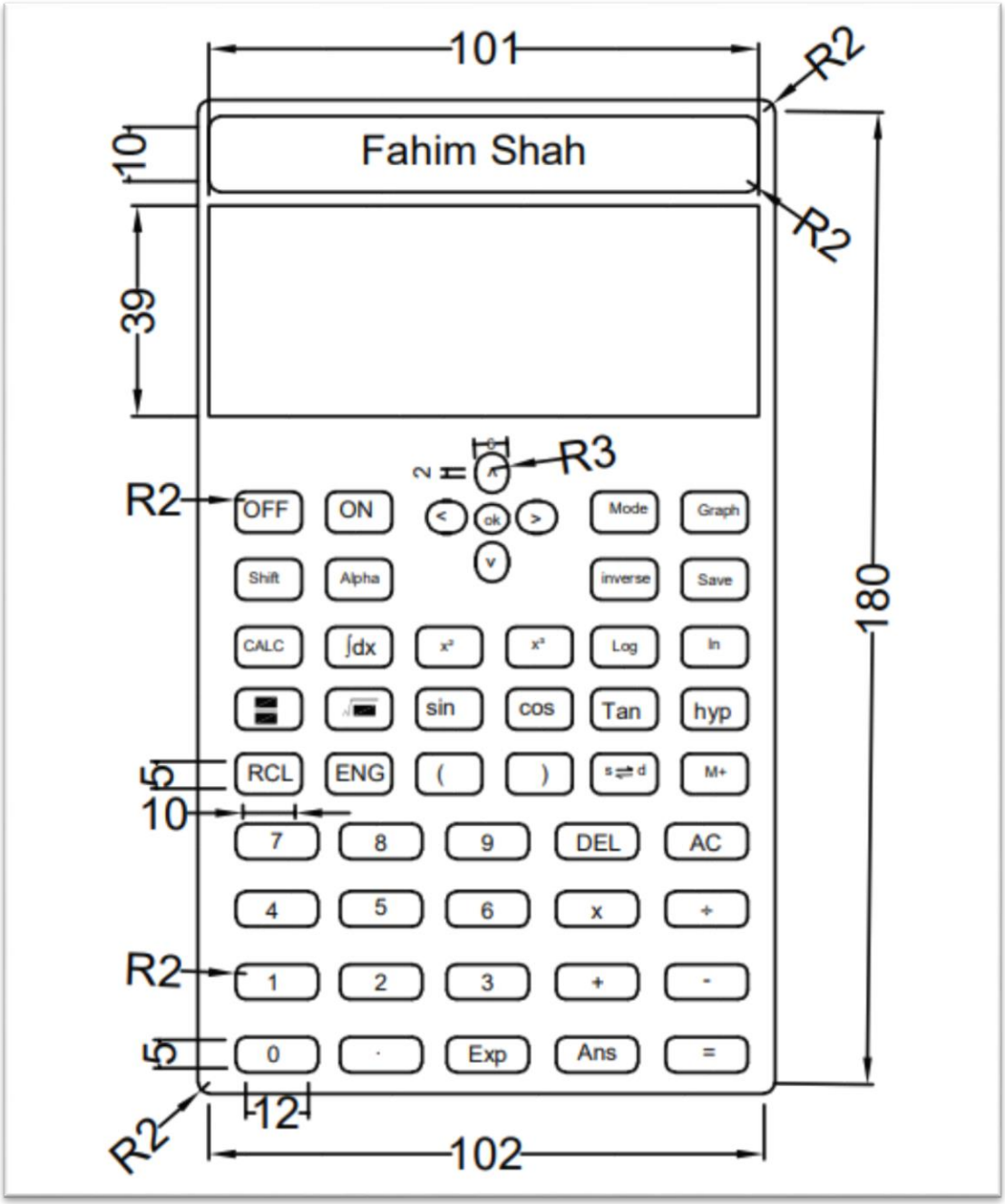
Specify next point or [Undo]:
Specify next point or [Undo]: *Cancel*
Command: TR
TRIM
Current settings: Projection=UCS, Edge=None, Mode=Quick
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Select object to trim or shift-select to extend or
[cuTting edges/Crossing/mOde/Project/eRase/Undo]:
Cancel
Automatic save to
C:\Users\ADMINI~1\AppData\Local\Temp\LAB_07_1_31789_9b5caa72.sv$ ...
Command:
Command: *Cancel*
Command: '_pan
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Command:
Command:
Command: _dim
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle
[Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:'_pan
>>Press ESC or ENTER to exit, or right-click to display shortcut menu.
Resuming DIM command.
Command:
Command: *Cancel*
Command: *Cancel*
Command: '_pan
Press ESC or ENTER to exit, or right-click to display shortcut menu.
Command: _dim
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Command:
Command:
Command:
Command: _TEXTEDIT
Current settings: Edit mode = Multiple
Select an annotation object or [Undo/Mode]:
Select an annotation object or [Undo/Mode]: *Cancel*
Command:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: *Cancel*
Command: DIM
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:b
Current settings: Offset (DIMDLI) = 2.000000
Specify first extension line origin as baseline or [Offset]:*Cancel*
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command:
Command: _dimradius
Select arc or circle:
Dimension text = 20
Specify dimension line location or [Mtext/Text/Angle]:
Command:
Command:
Command: _dimradius
Select arc or circle: *Cancel*
Command:
Command: _dimdiameter
Select arc or circle:
Dimension text = 70
Specify dimension line location or [Mtext/Text/Angle]:
Command:
Command:
Specify dimension line location or second line for angle
[Mtext/Text/text aNgle/Undo]:
Non-associative dimension created.
Select objects or specify first extension line origin or
[Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:

Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select extension line origin as baseline or [Continue]:
Current settings: Offset (DIMDLI) = 2.000000
Specify second extension line origin or [Select/Offset/Undo] <Select>:*Cancel*
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command: _u DIM GROUP
Command:
Command:
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command:
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:

Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Non-associative dimension created.
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Non-associative dimension created.
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Command:
Command:
Command: _dim
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Specify second extension line origin or [Undo]:
Specify dimension line location or second line for angle [Mtext/Text/text aNgle/Undo]:
Select objects or specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:
Command:
Command: _dimlinear
Specify first extension line origin or <select object>:
Specify second extension line origin:
Specify dimension line location or [Mtext/Text/Angle/Horizontal/Vertical/Rotated]:
Dimension text = 50
Command: _dimangular
Select arc, circle, line, or <specify vertex>:
Select second line:
Select second line:

Specify second extension line origin or [Undo]: Specify first extension line origin or [Angular/Baseline/Continue/Ordinate/aliGn/Distribute/Layer/Undo]:	Specify dimension arc line location or [Mtext/Text/Angle/Quadrant]: Dimension text = 150 Command: Command: Command: _qsave

Task 3:



Procedure:

- Draw body rectangle of length 102 units and width 180, name rectangle of length 101 and width 10 units, and another rectangle for the screen of length 101 and width 39 units.
- Give the offsets to all these rectangle of radius 2 units
- Draw a rectangle of length 12 units and width 5 and give fillet of radius 2 for the pad numerical and basic mathematical operation buttons and the copy and pasted all the required button
- Draw a rectangle of length 10 units and width 5 and give fillet of radius 2 for the specific operation buttons and the copy and pasted all the required button
- Inserted all the text to each button as required.
- At the end measure all the dimensions.

Commands:

Command: _mtedit Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: _pasteclip Specify insertion point: Command: _mtedit Command: _pasteclip Specify insertion point: Command: '_.quickproperties Command: '_.quickproperties Command: _copyclip 3 found Command: '_.quickproperties Command: _pasteclip Specify insertion point: Command: *Cancel* Command: *Cancel* Command: _u PASTECLIP GROUP Command: _copyclip 1 found Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: _.erase 2 found Command: _u ERASE Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: *Cancel* Command: _copyclip 1 found Command: *Cancel* Command: _.erase 1 found Command: _pasteclip Specify insertion point: Command: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: *Cancel*	Command: _pasteclip Specify insertion point: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: _mtedit ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: * Command: *Cancel* Command: _pasteclip Specify insertion point: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: _mtedit ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: *Cancel* Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Command: _copyclip 1 found Command: *Cancel* Command: _pasteclip Specify insertion point: Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: ** STRETCH ** Specify stretch point: Command: *Cancel* ** STRETCH ** Specify stretch point: Command: ** STRETCH ** Specify stretch point: Command: ** STRETCH ** Specify stretch point: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command:

Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: *Cancel*
** STRETCH **
Specify stretch point:
Command:
** STRETCH **
Specify stretch point:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: *Cancel*
** STRETCH **
Specify stretch point:
Command:
** STRETCH **
Specify stretch point:
Command: _pasteclip Specify insertion point:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: *Cancel*
Command: _copyclip 1 found
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: _pasteclip Specify insertion point:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command: _rotate
Current positive angle in UCS:
ANGDIR=counterclockwise ANGBASE=0
Specify base point:
Specify rotation angle or [Copy/Reference] <181>:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: *Cancel*
Command: _pasteclip Specify insertion point:

** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
** STRETCH **
Specify stretch point:
Command:
** STRETCH **
Specify stretch point:
Command: *Cancel*
Command: _.erase 1 found
Command: REC
RECTANG
Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:
Specify other corner point or [Area/Dimensions/Rotation]:
** STRETCH **
Specify stretch point:
** STRETCH **
Specify stretch point:
Command: *Cancel*
Command: F
FILLET
Current settings: Mode = TRIM, Radius = 1.7500
Select first object or [Undo/Polyline/Radius/Trim/Multiple]: m
Select first object or [Undo/Polyline/Radius/Trim/Multiple]: r
Specify fillet radius <1.7500>: 2
Select first object or [Undo/Polyline/Radius/Trim/Multiple]:
Select second object or shift-select to apply corner or [Radius]:
Select first object or [Undo/Polyline/Radius/Trim/Multiple]:
Select second object or shift-select to apply corner or [Radius]:
Select first object or [Undo/Polyline/Radius/Trim/Multiple]:
Select second object or shift-select to apply corner or [Radius]:
Select second object or shift-select to apply corner or [Radius]: *Cancel*
Command: FILLET
Current settings: Mode = TRIM, Radius = 2.0000
Select first object or [Undo/Polyline/Radius/Trim/Multiple]: m
Select first object or [Undo/Polyline/Radius/Trim/Multiple]: r
Specify fillet radius <2.0000>:
Select first object or [Undo/Polyline/Radius/Trim/Multiple]:
Select second object or shift-select to apply corner or [Radius]:
Select first object or [Undo/Polyline/Radius/Trim/Multiple]:
Select second object or shift-select to apply corner or [Radius]:
Select first object or [Undo/Polyline/Radius/Trim/Multiple]: *Cancel*
Command:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command: *Cancel*
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel*
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:
Command:
** STRETCH **
Specify stretch point or [Base point/Copy/Undo/eXit]:

Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: Current positive angle in UCS: ANGDIR=counterclockwise ANGBASE=0 Specify base point: Specify rotation angle or [Copy/Reference] <180>: ** STRETCH ** Specify stretch point or [Base point/Copy/Undo/eXit]: Command: *Cancel* Command: _pasteclip Specify insertion point: Command: _rotate Current positive angle in UCS: ANGDIR=counterclockwise ANGBASE=0 1 found Specify base point: Specify rotation angle or [Copy/Reference] <270>:	Command: Specify opposite corner or [Fence/WPolygon/CPolygon]: *Cancel* Command: *Cancel* Command: _PLOT Effective plotting area: 8.50 wide by 4.43 high Plotting viewport 2. Automatic save to C:\Users\ADMINI~1\AppData\Local\Temp\LAB_07_1_16785_c2fbb34e.sv$ ... Command: Command: *Cancel*

Engineering Drawing Lab 07

Method of Evaluation: Lab Report and in-lab marking by instructors.

Measured Learning Outcomes

CLO1: Describe and report basic engineering drawing problems.

CLO3: Reproduce 2-D and 3-D sketches using AutoCAD by applying engineering drawing principles.

	Excellent (10)	Good (9 to 7)	Satisfactory (6 to 4)	Unsatisfactory (3 to 1)	Poor (0)	Marks Obtained
Assignment (CLO1)	Required document filled-inneatly with meaningful answers to all questions, proper grammar and punctuations with proper conclusion drawn	Required document filled-in neatly with meaningful answers to most questions and proper conclusions drawn with some grammar mistakes	Some correct/meaningful answers and conclusions with some irrelevant ones. Some parts of the document not neat or some grammar mistakes.	Answers not understandable/ not relevant to questions. Conclusions not based on results. Illegible writing with no proper grammar/punctuation	Report/Hand out Not submitted	
Task Completion (CLO3)	All Tasks were completedsuccessfully in the time ofthe lab	Most of the tasks were completed in the given time of the lab	Some of the tasks were completed in the given lab time	Very few tasks were performed and completed in given lab time	Lab tasks weren't performed at all	
Total						