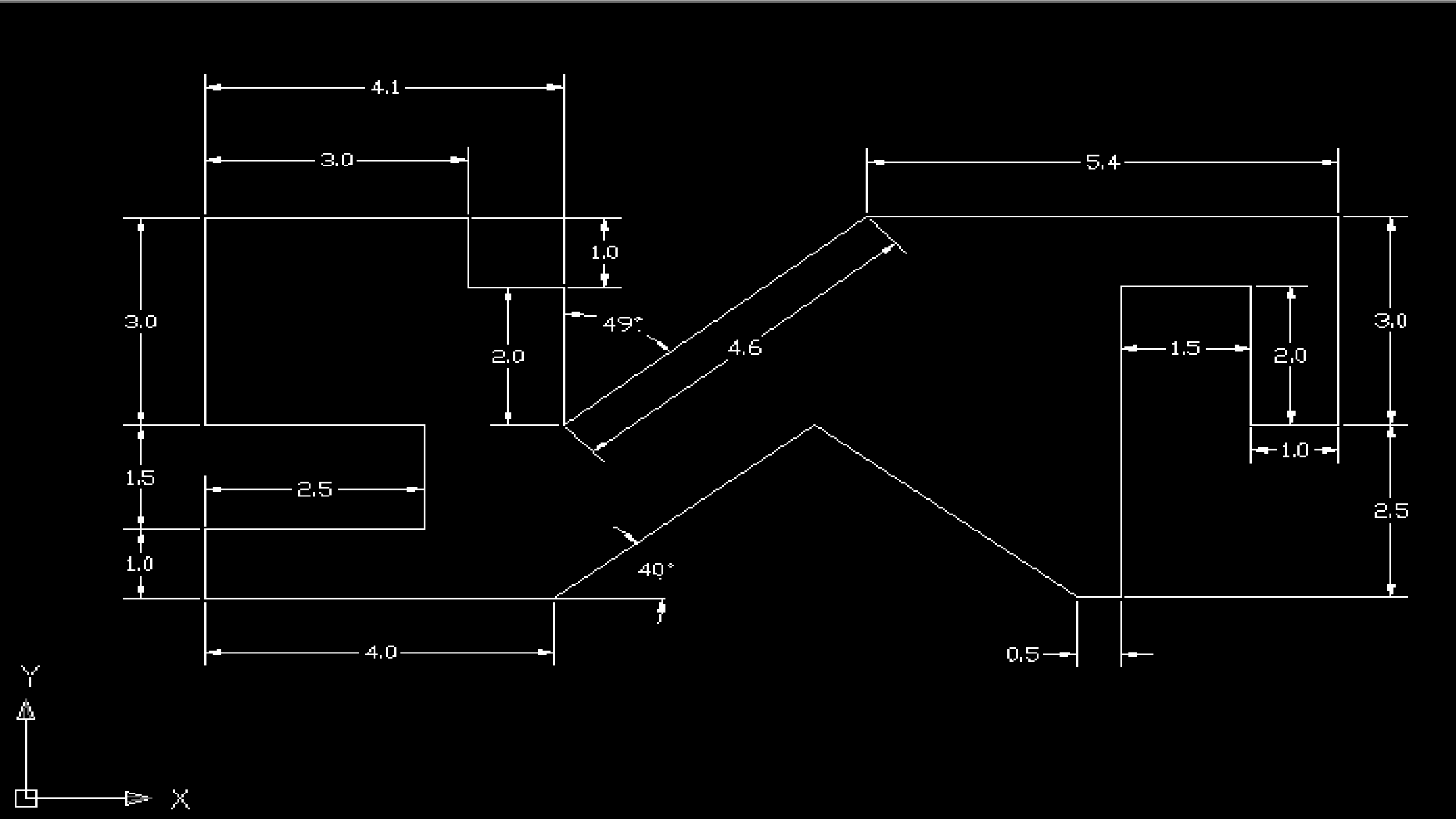
AUTODESK
AUTOCAD

CAD Lab

Lecture # 06

Practice Figures for 2D Drawings

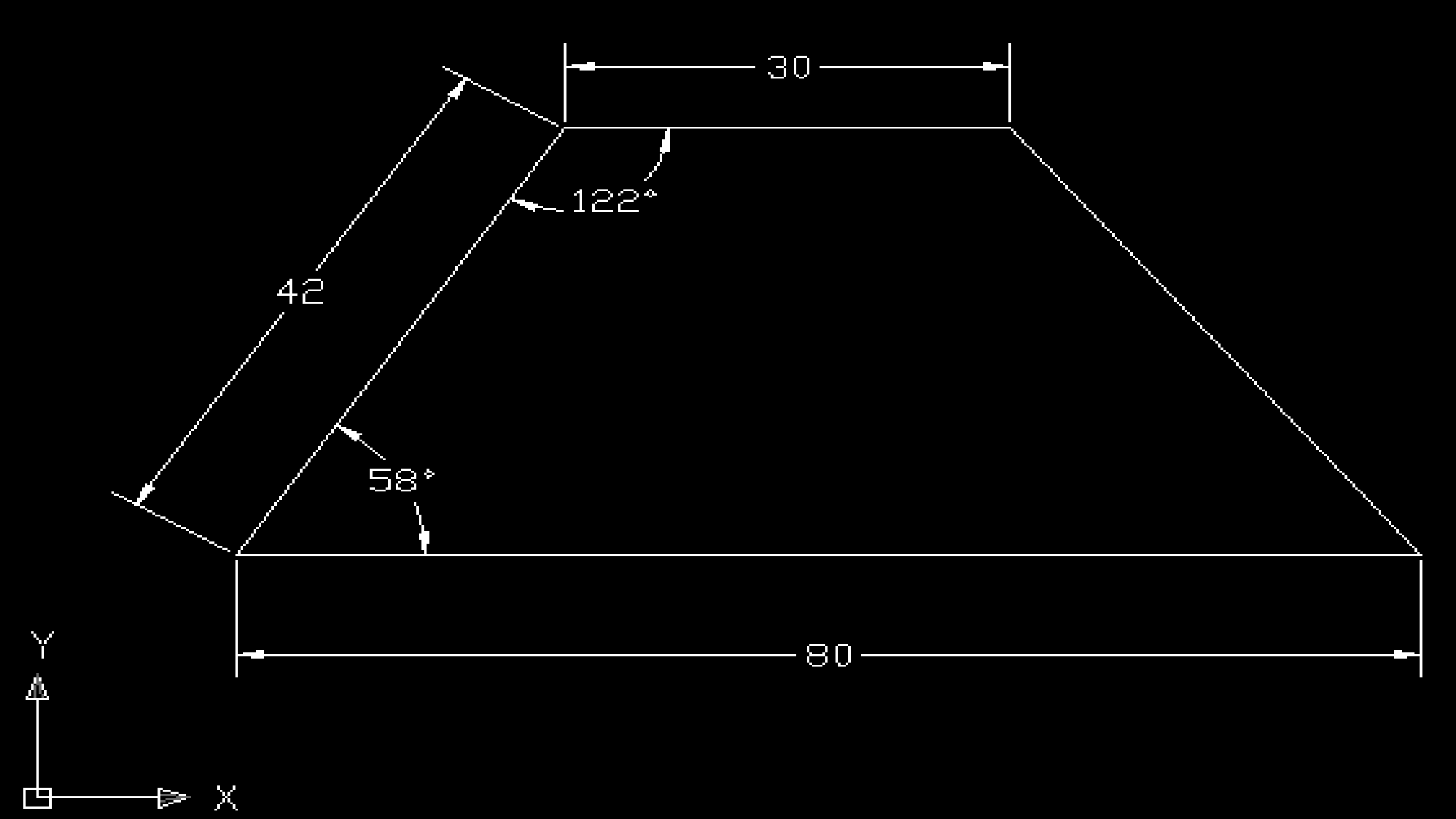

4.1
3.0
5.4
1.0
3.0
2.0
49°
4.6
1.5
2.0
3.0
1.5
2.5
1.0
40°
1.0
2.5
4.0
0.5
Y
X

List of Commands used:

- Line
- Ortho Mode ON & OSNAP ON from status bar
- Line at angle [@line length < angle]

Construction Steps:

1) Fix UCS icon.
2) Set units as decimal with precision up to 1 decimal point.
3) On ortho mode and click select all option in OSNAP.
4) Activate line command and draw a line of 4.0 units towards left and 1.0 units upward and similarly 2.5 units towards right side.
5) Draw a line of 1.5 units upward and similarly 2.5 units towards left side.
6) Draw a line of 3.0 units upward then 3.0 units rightward and 1.0 units downward and 1.1 units right side and then 2.0 units downward.
7) Sketch a line of 4.6 units at an angle of 49° by using command @4.6<41.
8) Then draw line of 5.4units rightward, 3.0 units vertically downward, 1.0 units left side, 2.0 units vertically upward and 1.5 units left side.
9) Draw a line 4.5 units vertically downward and 0.5 units leftward.
10) Draw an angle of 40° at starting point of first line drawn by using construction line at 49°.
11) Dimension the sketched drawing using dimension toolbar according to given figure

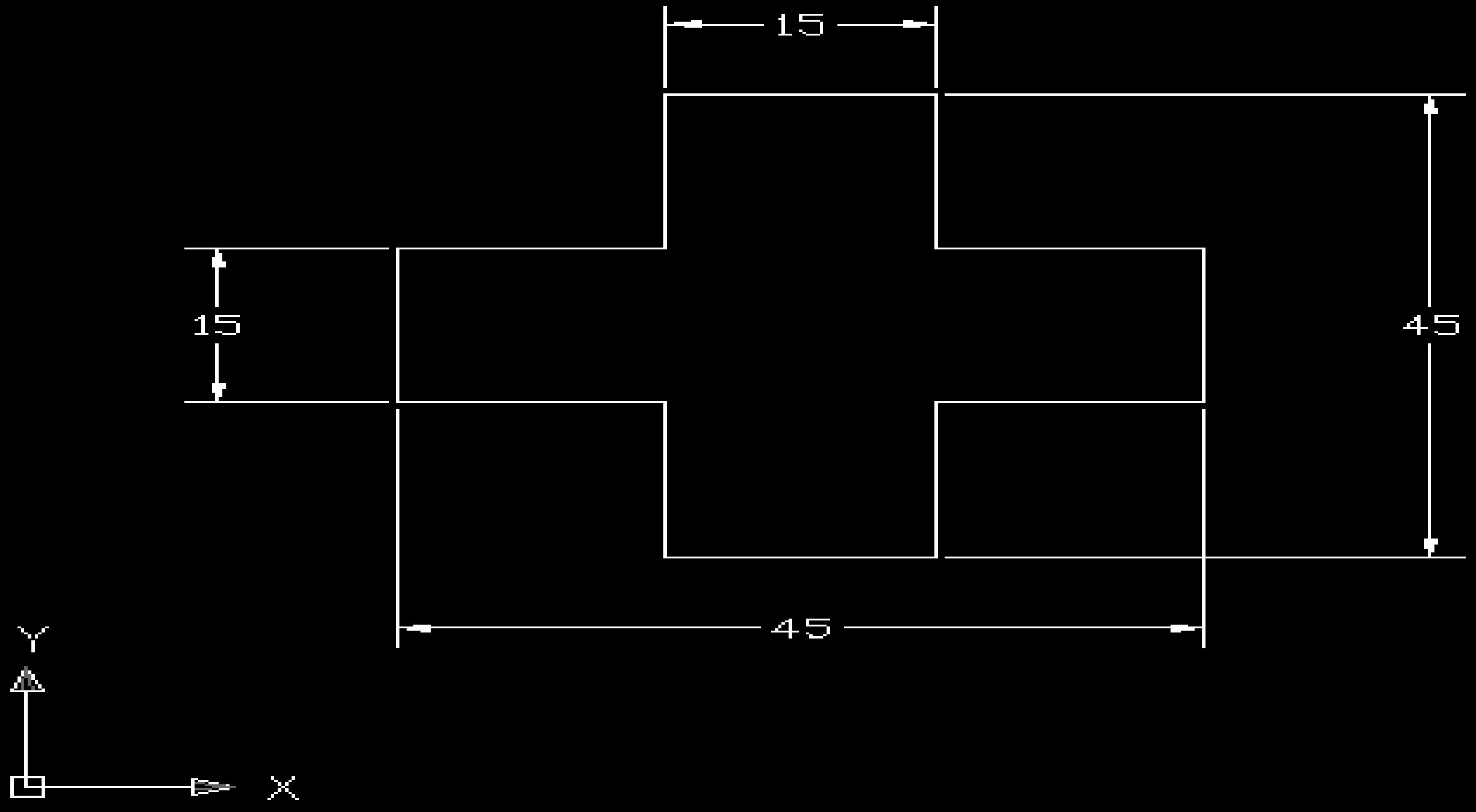

30
122°
42
58°
80
Y
X

List of Commands used:

- Line
- Ortho Mode ON & OSNAP ON from status bar
- Line at angle [@line length < angle]
- Dimension Toolbar

Construction Steps

1. Fix UCS icon.
2. Set units as decimal.
3. On ortho mode and click select all option in OSNAP.
4. Activate line command and draw a line of 80 units towards left.
5. Sketch a line of 42 units at an angle of 58° by using command @42<58.
6. Sketch a line of 30 units rightward and join it with the starting point of first line drawn (line of length 80 units).
7. Dimension the sketched drawing using dimension toolbar according to given figure.

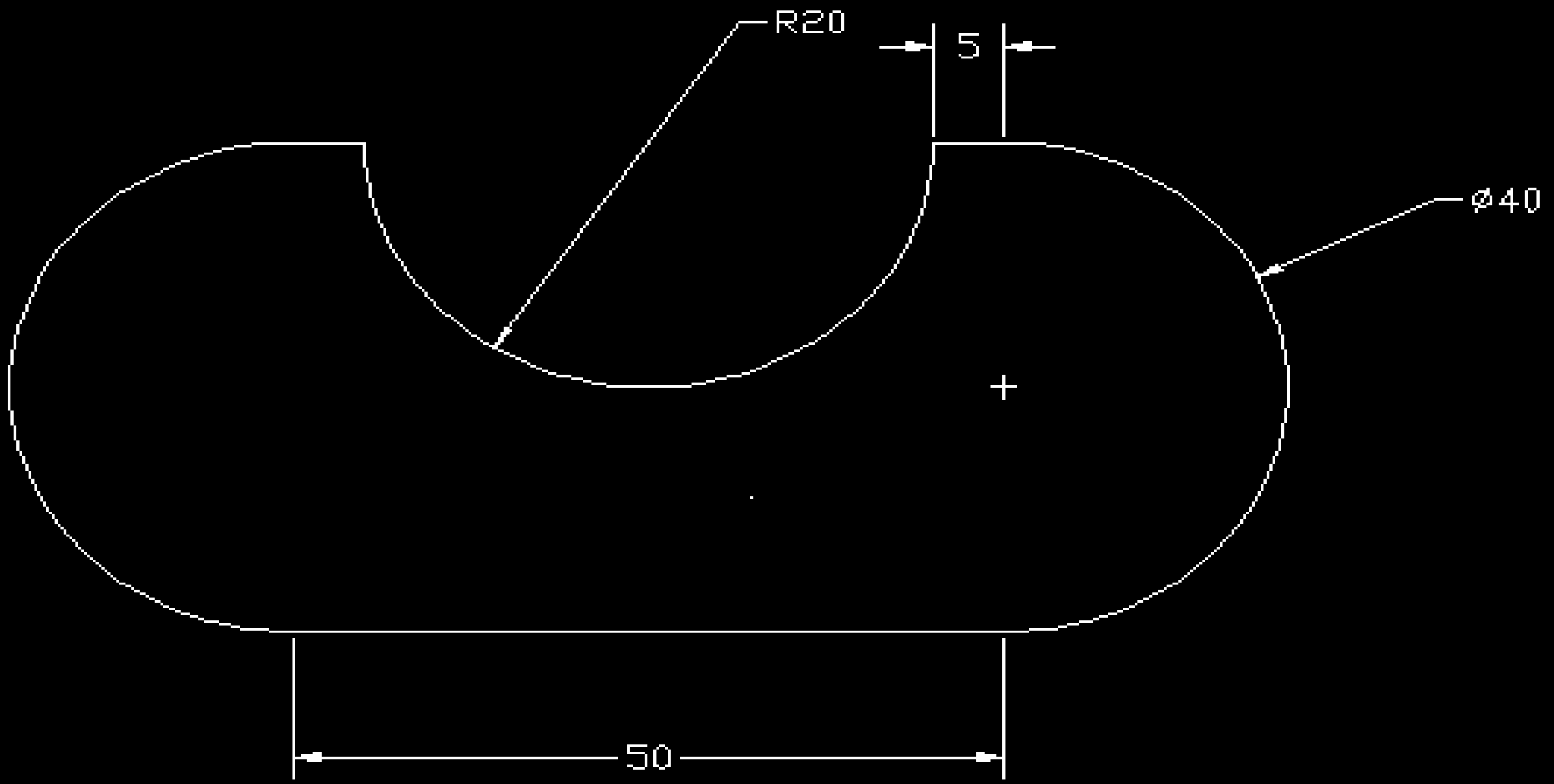

15
15
45
45
Y
X

List of Commands used:

- Line
- Ortho Mode ON & OSNAP ON from status bar
- Line at angle [@line length < angle]
- Dimension Toolbar

Construction Steps

1. Fix UCS icon.
2. Set units as decimal.
3. Activate line command and draw a line of 15 units towards leftward and 15 units vertically upward.
4. Draw a line of 15 units leftward, 15 units vertically upward and 15 units rightward.
5. Draw a line of 15 units vertically upward, 15 units rightward and 15 units vertically downward.
6. Draw a line of 15 units rightward, 15 units vertically downward, 15 units leftward and 15 units vertically downward.
7. Dimension the sketched drawing using dimension toolbar according to given figure.

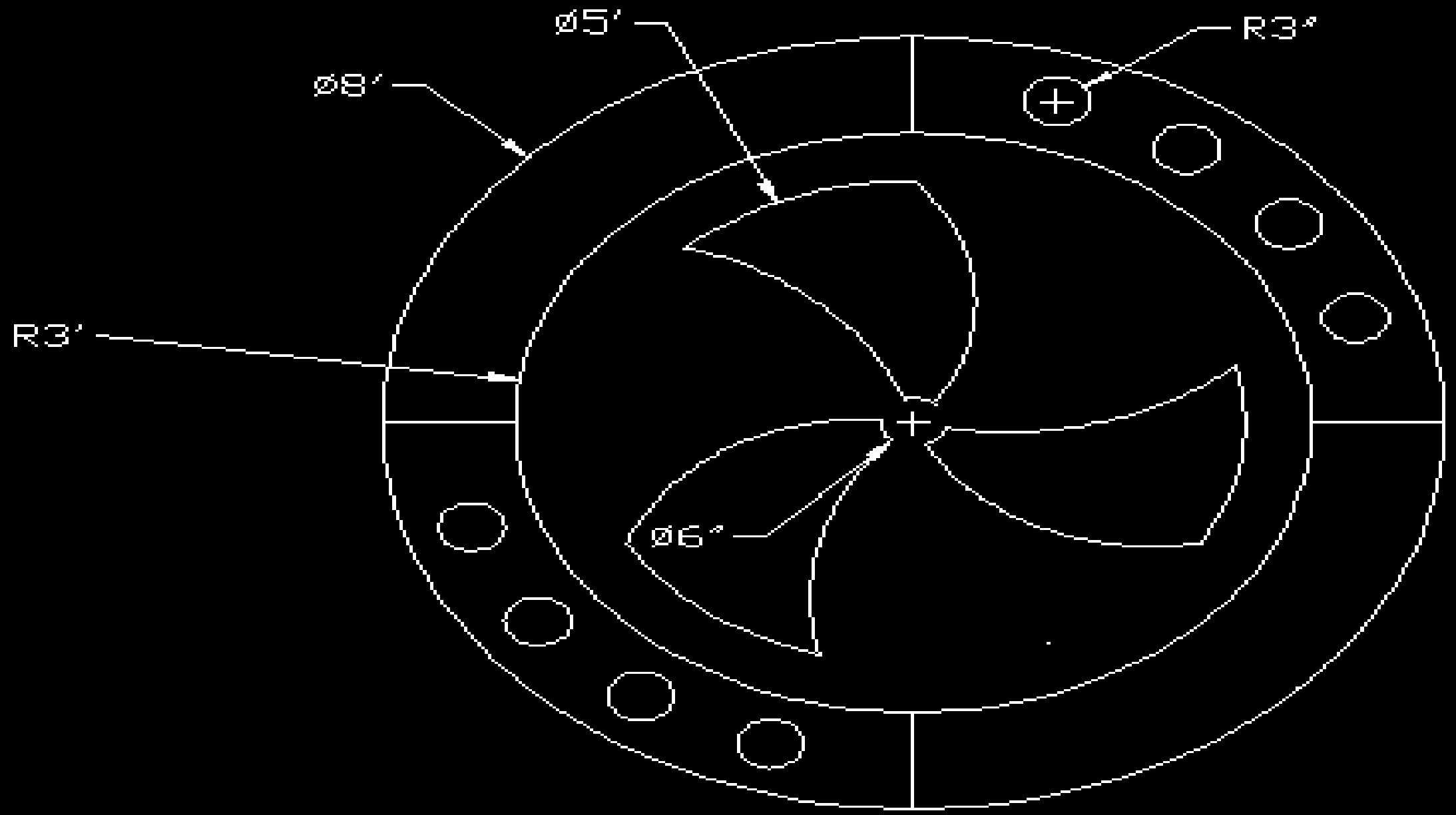

R20
5
ø40
50

List of Commands used:

- Line
- Circle
- ORTHO Mode ON & OSNAP ON
- Two point circle or arc
- Trim
- Dimension Toolbar

Construction Steps:

1. Fix UCS icon and set units as decimal with precision up to one decimal.
2. Turn on ORTHO mode and OSNAP.
3. Draw a circle having diameter 40.
4. Draw a line of 50 units towards left from bottom centre of circle.
5. Draw a line of 20 units vertically upward and draw a circle of diameter 40 at its end point.
6. Now draw a line of 5 units towards right from upper centre of circle and similarly towards left from upper centre of first circle.
7. Draw a two point circle that touches the end points of lines having length 5 units.
8. Now use Trim command to remove the extra drawing parts.
9. Finally dimension the drawing by using Dimension tool bar.

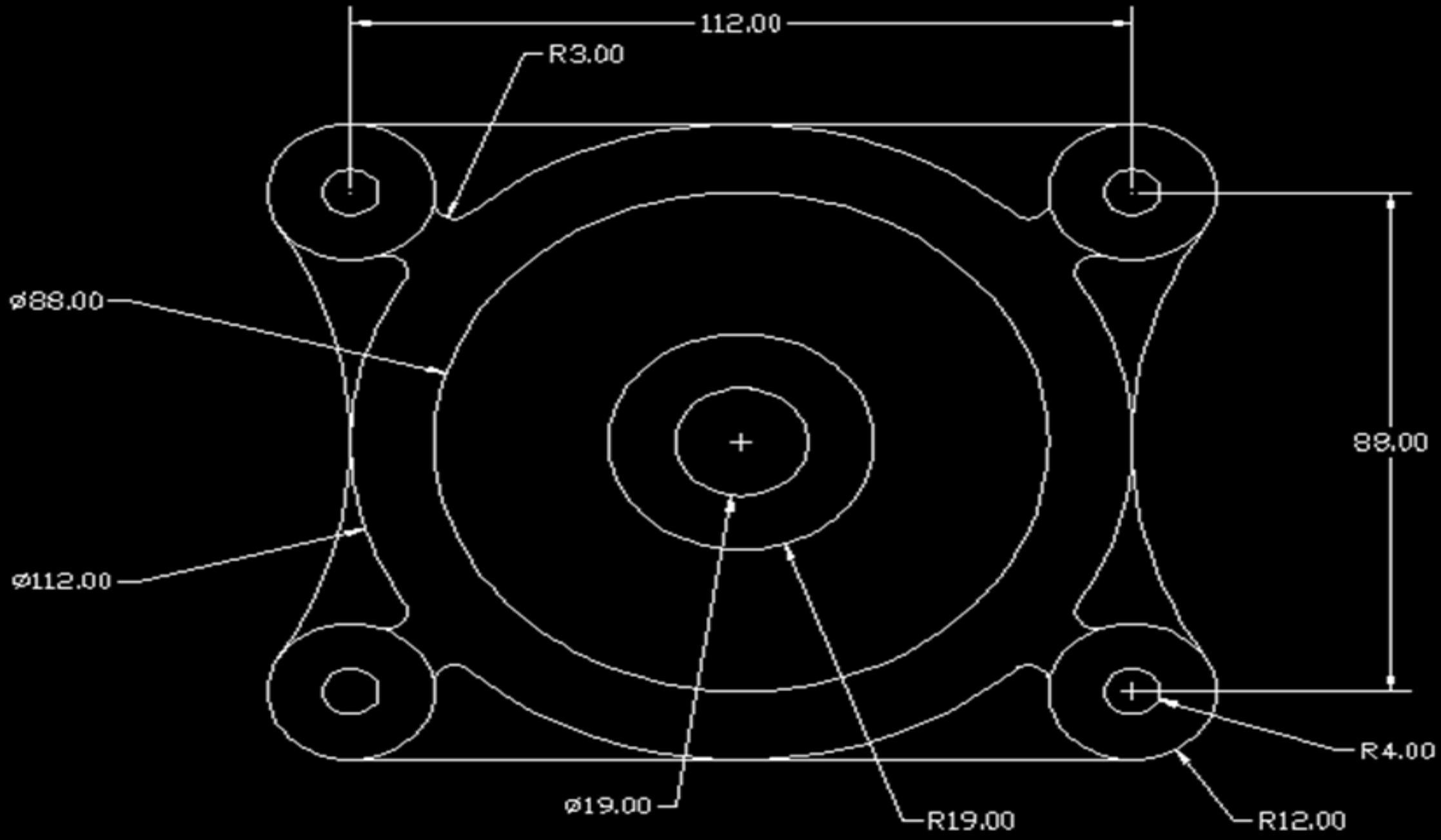

Ø5'
R3"
Ø8'
R3'
Ø6"

List of commands used:

- Circle
- Trim
- Construction Line
- Arc
- ORTHO and OSNAP ON
- Polar Array
- Dimension Toolbar

Construction Steps:

1. Fix UCS icon and set drawing and dimensioning units as Engineering.
2. Turn on ORTHO mode and OSNAP.
3. Draw a circle of diameter 6''.
4. Draw a circle of diameter 5'.
5. Draw a circle of radius 3'.
6. Draw a circle of diameter 7' and 8'.
7. Using construction line, draw angles of 18, 36, 54 and 72 degree that pass through centre of circles.
8. Now draw circles having radius 3'' keeping centres the intersection points of construction lines at circle of diameter 7'.
9. Use polar array to draw these circles on other side.
10. Use three point arc to draw fans.
11. Use trim command to trim unwanted drawing.
12. Dimension the drawing using dimension toolbar.

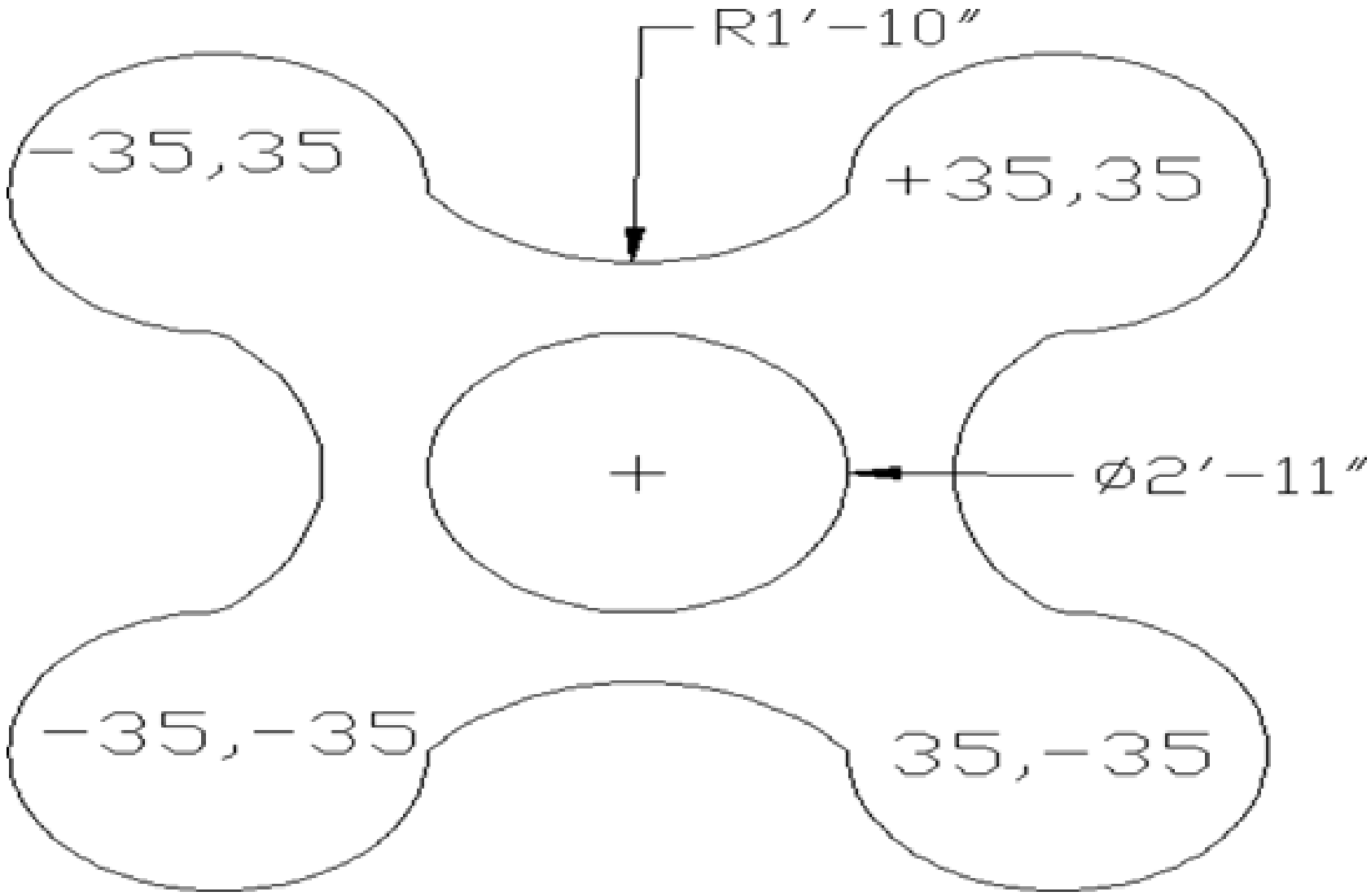

112.00
R3.00
ø88.00
ø112.00
88.00
ø19.00
R19.00
R4.00
R12.00

List of commands used:

- Line
- Circle
- Arc
- Trim
- ORTHO and OSNAP ON
- Dimension Toolbar
- Mirror
- Fillet

Construction Steps:

1. Draw a line of 136 units towards left and then 112 units downward and complete the rectangle.
2. Fillet its all four corners of radius 12 units.
3. Draw a circle of diameter 19 units at the meeting point of perpendicular bisectors of all four sides.
4. Keeping same centre draw a circle of radius 19 and two more circles of diameters 88 and 112 units respectively.
5. Draw two circles of radius 4 and 12 respectively at the fillet centre.
6. Mirror it at other corners.
7. Now meet the circles of radius 12 units with circle of diameter 112 units using tan tan rad circle.
8. Now Draw three point arcs at left and right side of rectangle.
9. Trim the unwanted drawing.
10. Dimension the drawing using drawing toolbar.

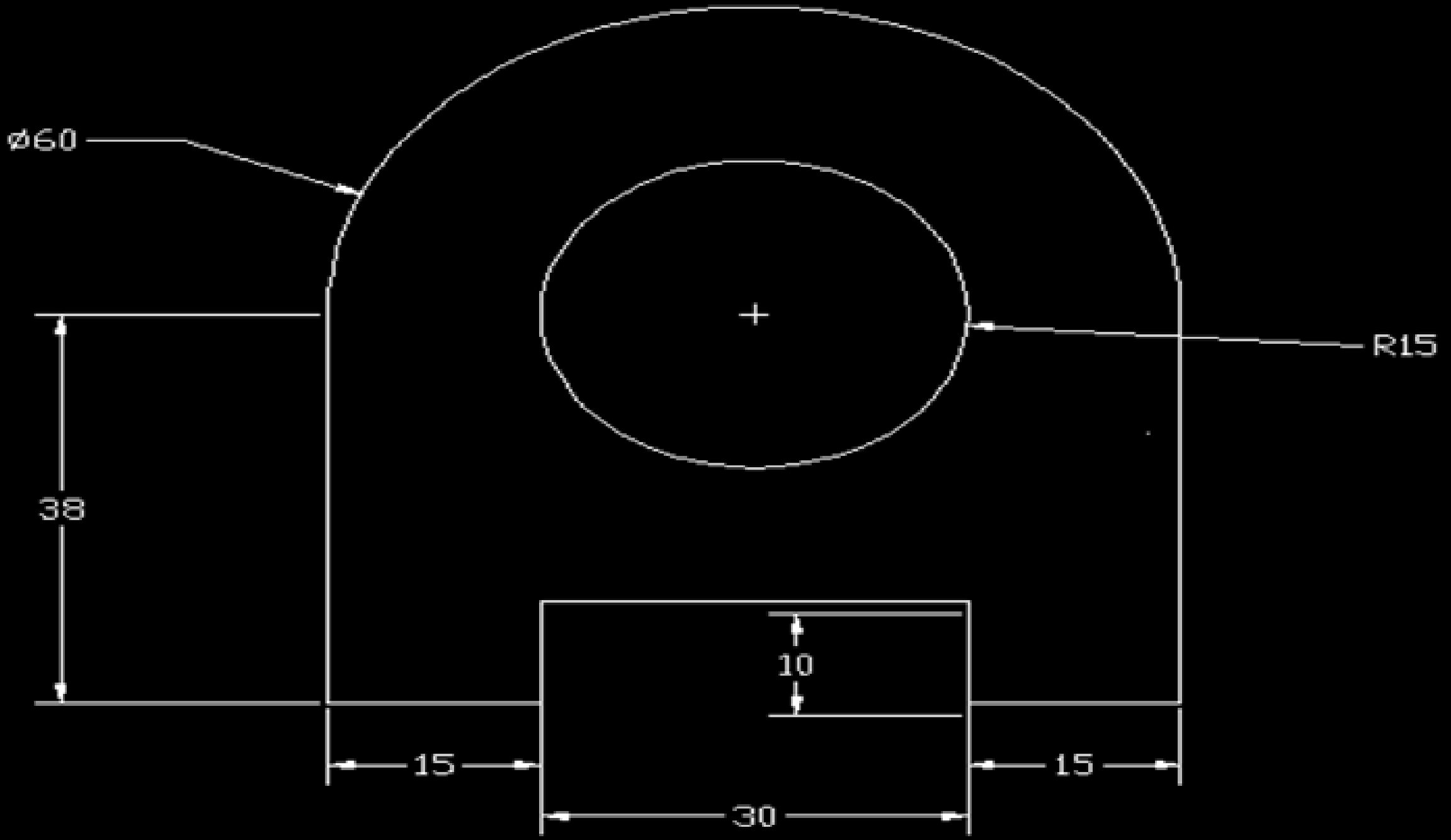

R1′−10″
−35,35
+35,35
+
ø2′−11″
−35,−35
35,−35

List of commands used:

- ORTHO and OSNAP ON
- Circle
- Circles using coordinates
- Arc (start, end, radius)
- Trim
- Dimension Toolbar

Construction Steps:

1. Fix UCS Icon and set units as engineering.
2. Draw a circle of diameter 35”.
3. Move 35” up from centre of this circle and then 35” towards right and draw a circle of diameter 35”.
4. Similarly, move 35” up from centre of first circle and then 35” towards left and draw a circle of diameter 35”.
5. Move 35” downward from centre of the first circle and then 35” towards right and draw a circle of diameter 35”.
6. Move 35” downward from centre of the first circle and then 35” towards left and draw a circle of diameter 35”.
7. Now activate arc command (start, end, radius) and join the drawn circles.
8. Use trim command to remove unnecessary drawing parts.
9. Dimension the drawing using Dimension toolbar.

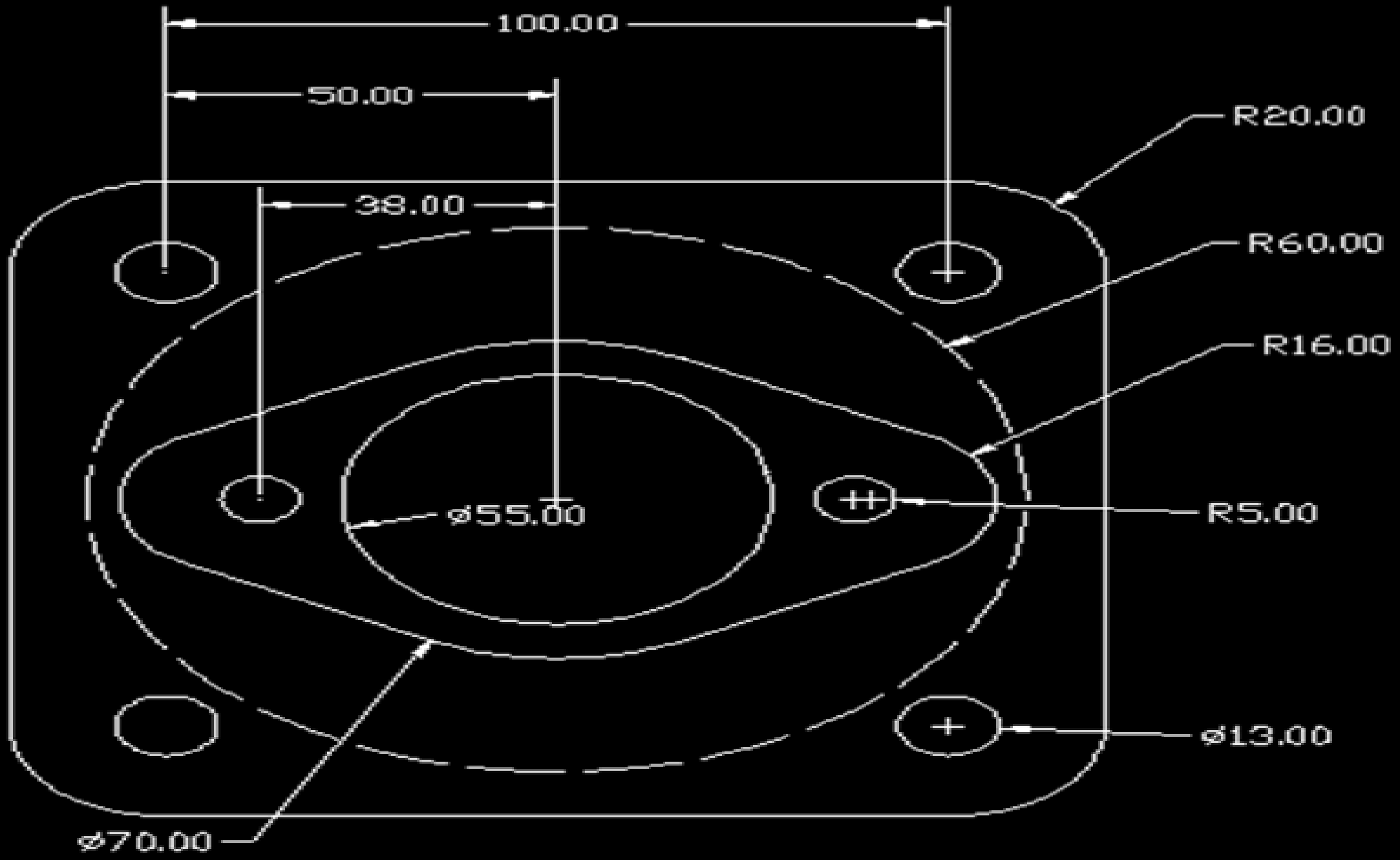

ø60
R15
38
10
15
15
30

List of commands used:

- ORTHO and OSNAP ON
- Line
- Circle
- Two point circle or arc
- Trim
- Dimension Toolbar

Construction Steps:

1. Fix UCS icon and set units as Decimal.
2. Draw a line of 38 units downward, 15 units leftward, 10 units upward, 30 units leftward, 10 units downward, 15 units leftward and then 38 units upward.
3. Draw two point circle.
4. Taking same centre draw another circle of radius 15 units.
5. Use Trim command to remove unnecessary drawing.
6. Use dimension toolbar to dimension the drawing.

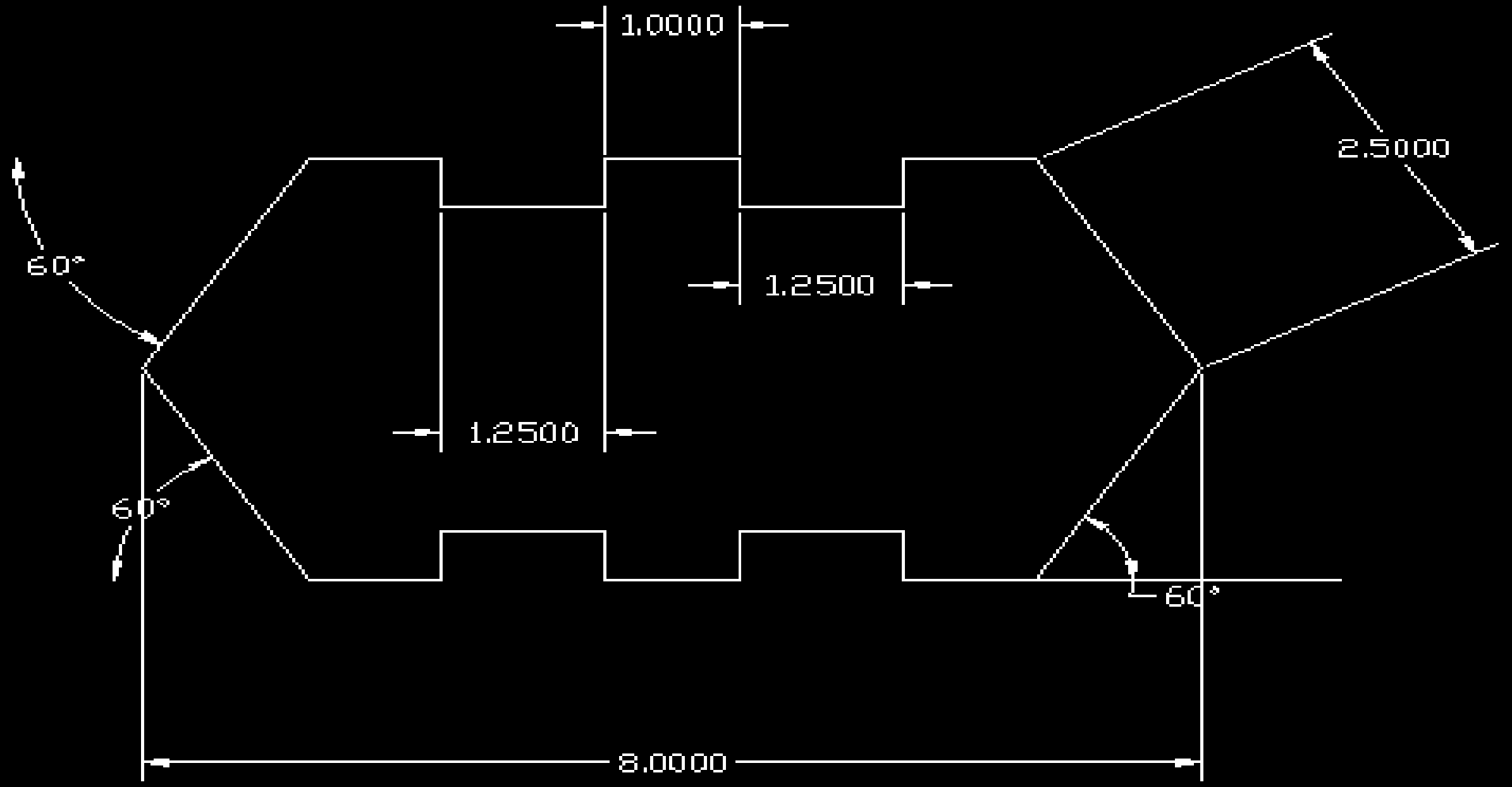

100.00
50.00
38.00
R20.00
R60.00
R16.00
ø55.00
R5.00
ø13.00
ø70.00

List of commands used:

- ORTHO and OSNAP ON
- Line
- Circle
- Fillet
- Trim
- Dimension Toolbar
- Line tangent to circle

Construction steps:

1. Fix UCS Icon.
2. Set units as decimal.
3. Using line command draw a square having each side of 140 units.
4. Fillet its corners having radius 20 units.
5. Draw circles of diameter 13 units at fillet centres.
6. Draw circles of diameter 55, 70 units and another circle of radius 60 units at centre of square.
7. Draw a line of 38 units from centre of square to leftward and rightward and using their end points as centres, draw circles of radius 5 and 16 units respectively.
8. Use line tangent to circle to meet circles boundaries.
9. Trim unnecessary drawing.
10. Use dimension toolbar to dimension the drawing.

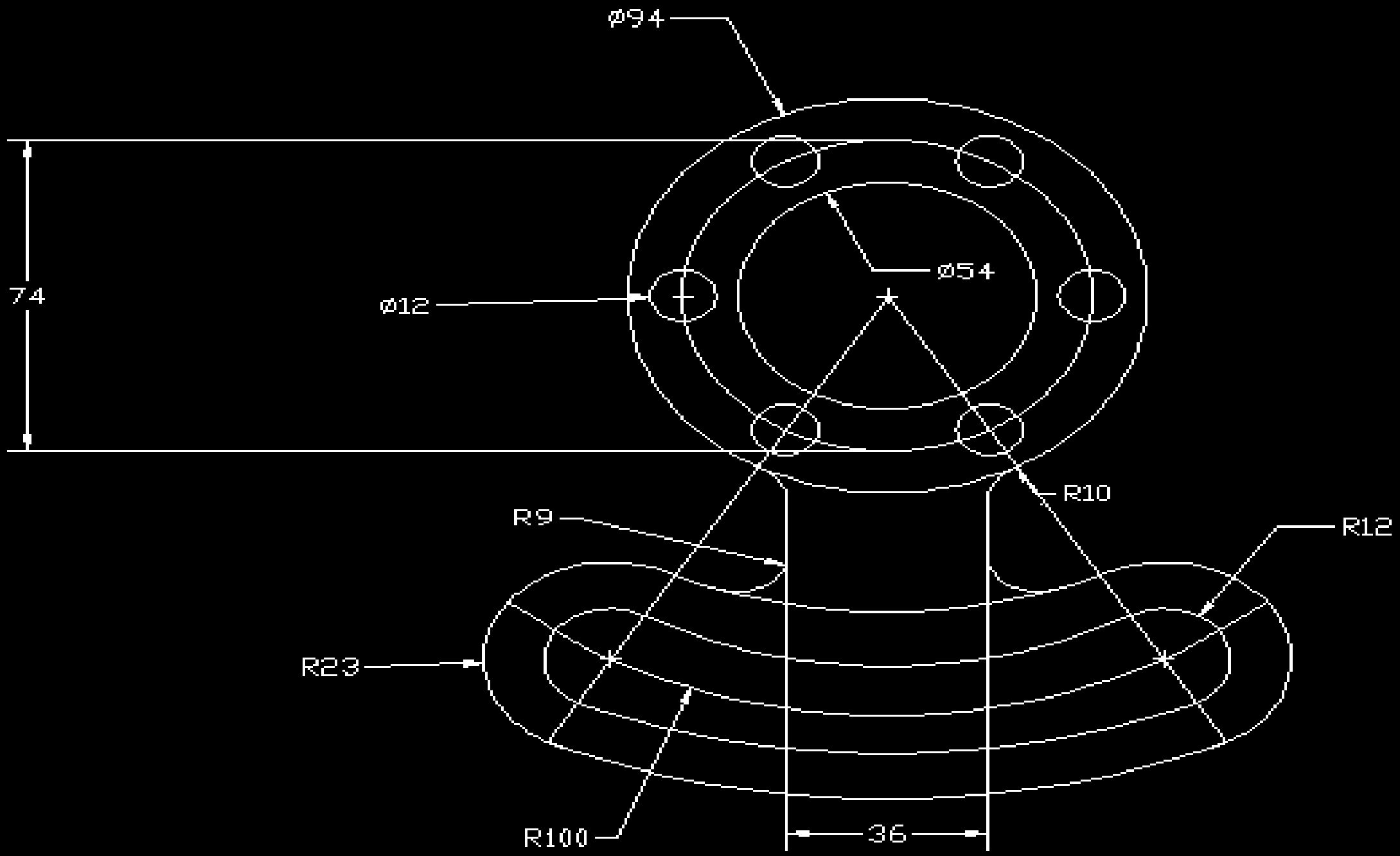

1.0000
2.5000
60°
1.2500
1.2500
60°
60°
8.0000

List of commands used:

- ORTHO and OSNAP ON
- Line
- @length<angle
- Mirror
- Erase
- Dimension Toolbar

Construction Steps:

1. Fix UCS Icon and set units as decimal.
2. Draw a line of 80 units.
3. At its end draw a line of 2.5 units at an angle of 60 using command @2.5<60.
4. Draw a line of 1 unit rightward, 0.5 unit downward, 1.25 units rightward, 0.5 units upward, 1 unit rightward, 0.5 unit downward, 1.25 units rightward, 0.5 unit upward and then 1 unit rightward and join it with the starting point of line of 8 units.
5. Draw a mirror line and mirror the drawing.
6. Dimension the drawing using dimension toolbar.


Ø94
74
Ø12
Ø54
R10
R9
R12
R23
R100
36

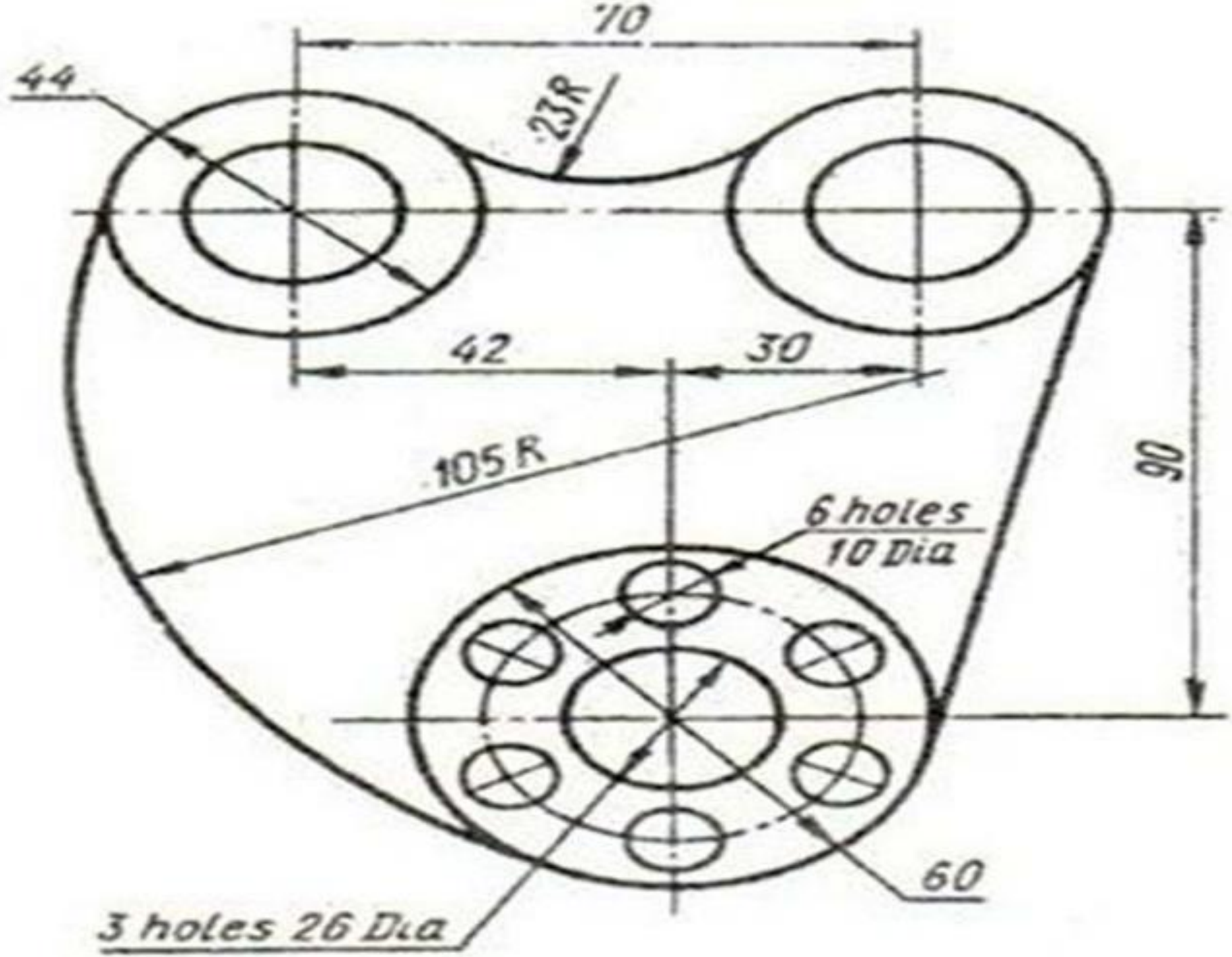
List of commands used:

- ORTHO and OSNAP ON
- Circle
- Arc
- Line
- Construction line
- Mirror
- Trim
- Erase
- Dimension Toolbar
- Polar Array

Construction Steps:

Fix UCS Icon and set units as decimal.

1. Draw circles of diameter 54, 74, 94 units and radius 100 units.
2. Draw a circle of diameter 12 units at the point on boundary of circle(Ø 74) parallel to its centre point.
3. Use polar array to draw other five circles.
4. Now draw two construction lines that pass through the centres of lower circles of diameter 12 units.
5. These construction lines intersect the boundary of circle (R100).
6. Use these points as centre and draw circles of radius 12 and 23 units.
7. Use the arc to join the boundaries and centres of these to circles.
8. Now draw a line 18 units leftward and rightward from lower bottom point on boundary of circle (Ø 74 ↵ parallel to its centre.
9. Use arc to join these lines with circle and to join with lower arc use tan, tan, rad circles.
10. Use trim command to remove unnecessary parts of drawing.
11. Dimension the drawing using Dimension Toolbar.

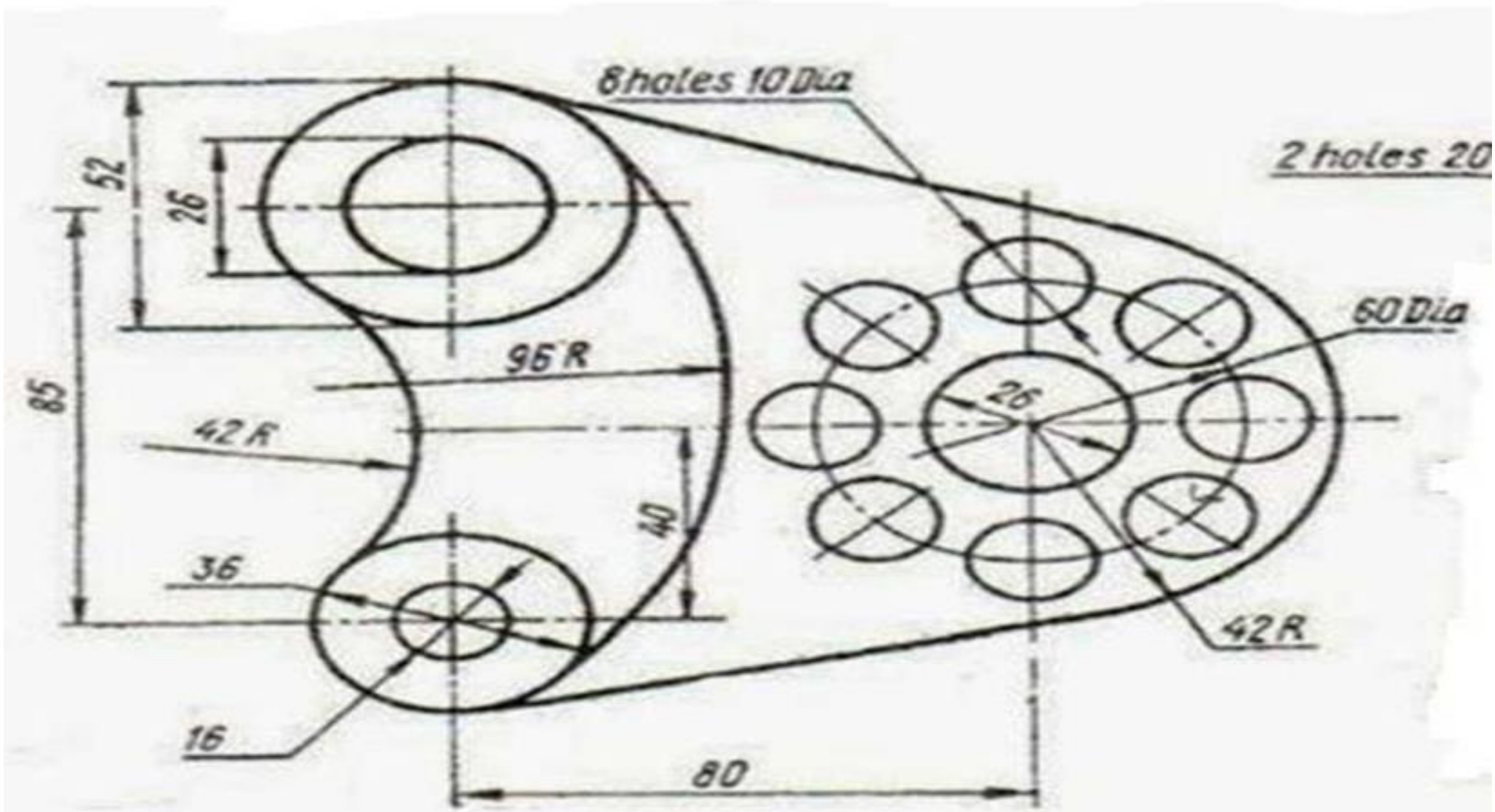

110
44
23R
42
30
105R
6 holes
10 Dia
90
60
3 holes 26 Dia

List of commands used:

- ORTHO and OSNAP ON
- Line
- Circle
- Polar array
- Line tangent on circle
- Arc
- Two point circle
- Trim
- Erase
- Dimension Toolbar

Construction steps:

1. Fix UCS Icon and set units as decimal.
2. Draw circles of diameter 26, 44 and 60 units.
3. Draw a circle of diameter 10 units at upper boundary point of circle (Ø 44) parallel to its centre.
4. Use polar array to draw other 5 circles.
5. Now activate line command and draw a line of 90 units upward from centre of circles.
6. Draw it 30 units rightward and 42 units leftward.
7. Taking these points as centres, draw circles having diameter 26 and 44 units.
8. Now draw two point circle or arc having radius 23 units that joins boundary of circles
9. Now use line tangent to circle command to join boundaries of circles having diameter 60 and 44 units.
10. Draw start, end and radius arc to join the remaining boundary.
11. Trim the unnecessary drawing.
12. Dimension the drawing using dimension Toolbar.

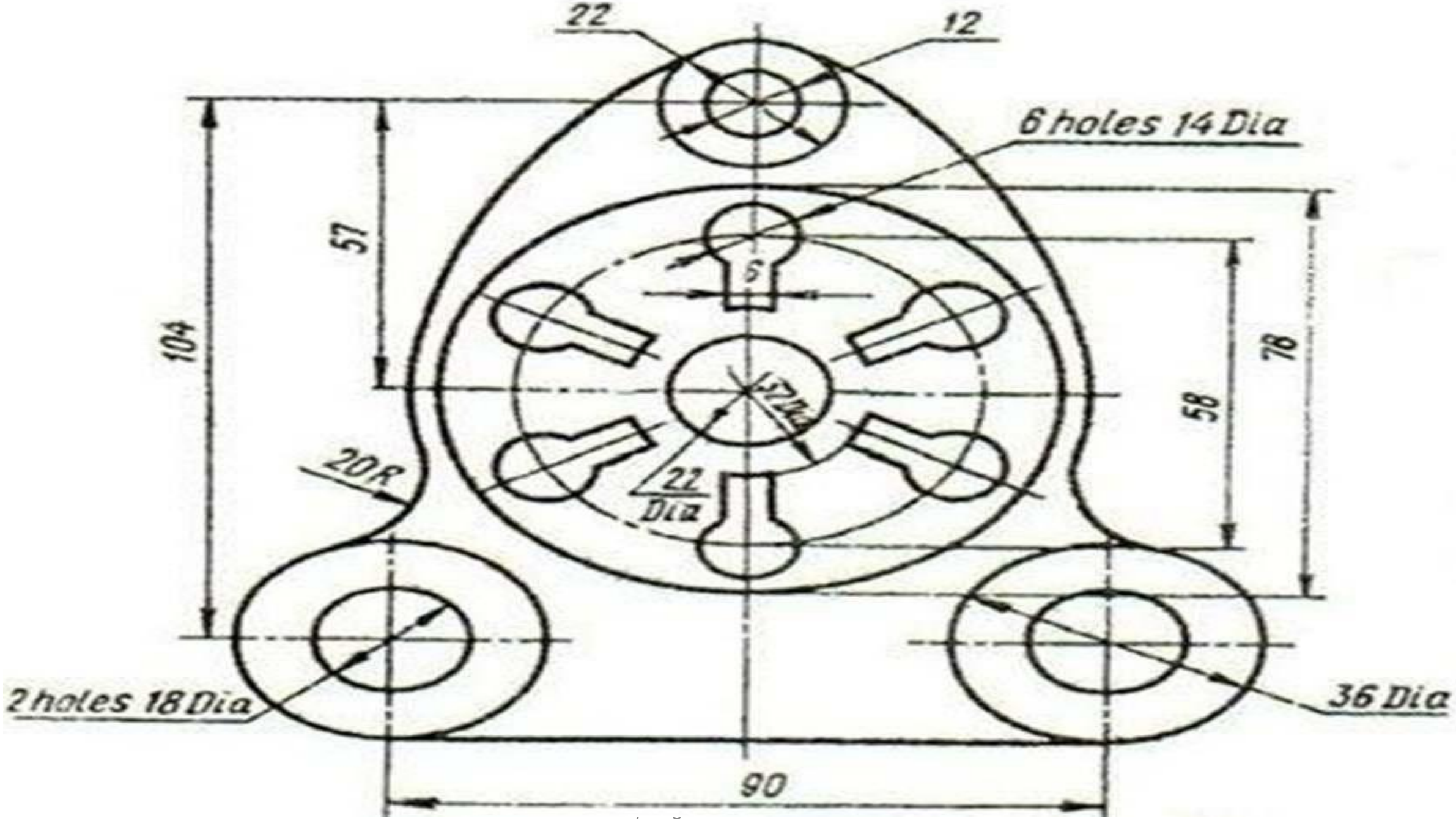

8 holes 10 Dia
2 holes 20
60 Dia
52
26
85
95 R
42 R
40
36
16
80
26
42 R

List of commands used:

- ORTHO and OSNAP ON
- Line
- Circle
- Arc
- Polar Array
- Trim
- Erase
- Line tangent to circle
- Dimension toolbar

Construction Steps:

1. Fix UCS Icon and set units as decimal.
2. Draw circles of diameters 26 and 60 units and one more circle of radius 42 units.
3. Draw a circle of diameter 10 units at upper boundary point of circle (Ø 60).
4. Use polar array to draw other 7 circles.
5. Now activate line command and draw a line of 80 units leftward from centre of circles.
6. Draw it 52 units upward and 59 units downward.
7. Taking these points as centres, draw circles having diameter 26 and 52 units upward and circles of diameters 16 and 36 downward.
8. Now draw two point circle or arc having radius 42 units that joins boundary of circles.
9. Now use line tangent to circle command to join boundaries of circles.
10. Trim the unnecessary drawing and dimension the drawing using dimension Toolbar.

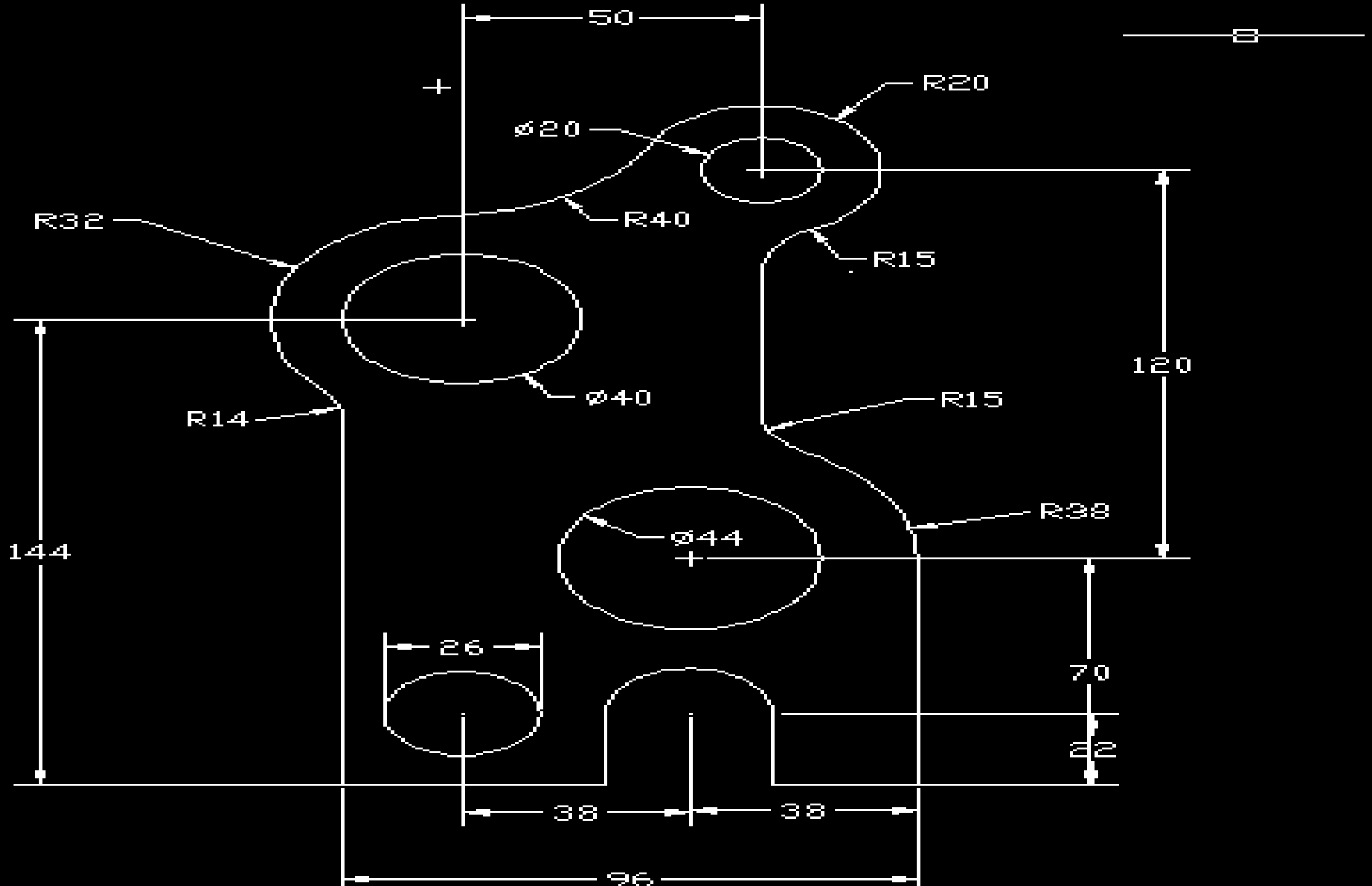

22
12
6 holes 14 Dia
57
104
6
58
78
20R
22 Dia
2 holes 18 Dia
36 Dia
90

List of Commands used:

- Circle
- Line
- Offset
- Polar Array
- Mirror
- Line (Tangent)
- Circle (TAN,TAN, RADIUS)
- Fillet
- Trim
- Erase
- Dimension Toolbar

Construction Steps:

1. Fix UCS Icon and set units as decimal.
2. Draw two circles of diameter 18 and 36 units.
3. Draw a line from their bottom centre point towards leftward 90 units.
4. Move 36 units upward and again draw the two circles.
5. Move 45 units rightward from centre of the circles drawn. Now draw a line upward 47 units and draw circles of diameter 22,32,58 and 78.
6. Draw a circle of diameter 14 units on the circle boundary of circle having diameter 58 units.
7. Now from bottom centre point of this circle draw a line of 3 units rightward and 3 units leftward and join the lines with upward circle and downward circle.
8. Now draw a line 57 units upward from centre of circles and draw circles of diameter 12 and 22 units.
9. Now Draw an arbitrary circle and join it with upper circles using line tangent to circle command.
10. Now use tan tan radius circle to draw circle of 15 units.
11. Trim the unnecessary drawing.
12. Dimension the drawing using dimension toolbar.
13. Drawing is ready.


50
8
R20
ø20
R40
R32
R15
120
ø40
R14
R15
R38
ø44
144
26
70
42
38
38
96

Construction Steps:-

1. Fix UCS icon and set units as decimal.
2. Draw a line of 96 units.
3. Move 38 units leftward on line and draw a line 22 units upward and draw a circle radius 14 units.
4. Now from centre of circle draw a line leftward 38 units and draw a circle of diameter 26 units.
5. Join the circle of radius 14 with lower line.
6. Draw a line 70 units upward from centre of circle having radius 14 units and draw circles having diameters and radius 44 and 38 units respectively.
7. Now draw a line of 122 units upward from the centre of circle having diameter 26 units and draw circles having diameter and radius 40 and 32 units respectively.
8. Now draw a line 50 units leftward from centre of circles having diameter and radius 40 and 32 units respectively and then 68 units upward and draw circles of diameter and radius 20 and 20 units respectively.
9. Use Tan Tan Rad circles to join the drawn circles.
10. Trim the unnecessary drawing.
11. Dimension the drawing using dimension Toolbar.

THANKS...!

QUESTIONS ARE WELCOME ....!!!