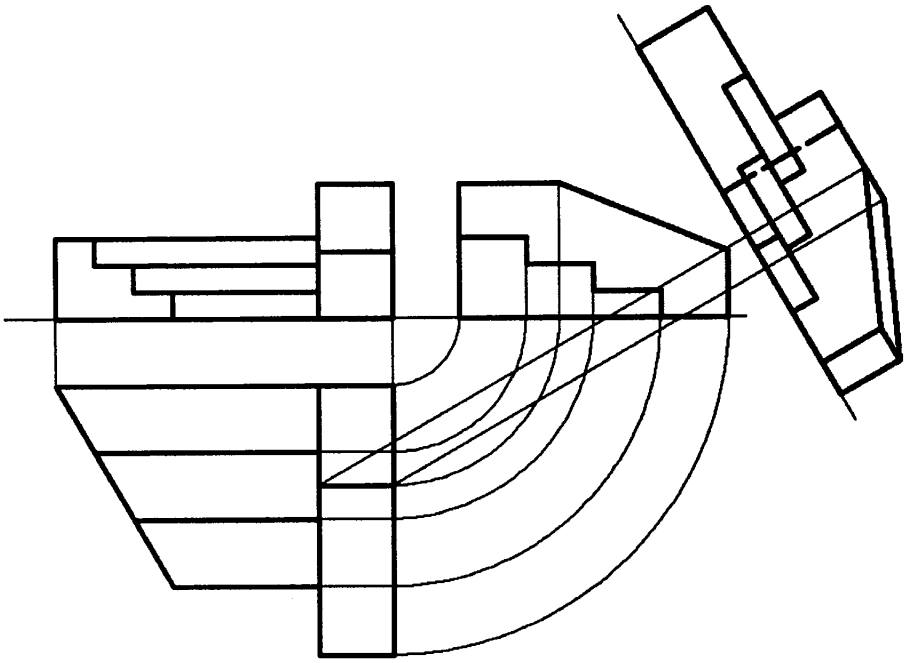
Section A

Q1.	10	Five diagrams, 2 marks for each correct label
Q2.	4	Selecting any two chords to be bisected
	4	Bisecting both chords to locate centre
	2	Drawing the required circle
Q3.	5	Trim command (Break and Erase, 3 marks and 2 marks respectively)
	5	Fillet command (Chamfer command, 2 marks)
Q4.	4	Elevation (Deduct 1 mark if internal lines are omitted)
	4	Plan (Deduct 1 mark if internal lines are omitted)
	2	End View (Deduct 1 mark if internal lines are omitted)
Q5.	10	Five parts, 2 marks for each correct label
Q6.	10	Five lines required, 2 marks each
Q7.	5	Line L redrawn from point Q (arc 3, line 2)
	5	New location for point P
Q8.	4	Obtaining slope length or edge length for surface S
	4	Projections for drawing of developed surface
	2	Drawing of developed surface
Q9.	4	Dividing one side into three parts
	2	Constructing one of the enlarged sides (five parts)
	4	Completion of enlarged figure (Radiating lines 2, completion 2)
Q10.	4	Projections from elevation
	4	Projections or widths from plan
	2	Completion of developed surface
Q11.	5	Ring depicted correctly in a pictorial sketch
	5	Proportions in keeping with orthographic views
Q12.	5	Shade
	5	Texture
Q13.	6	Locating mid-point of side QR
	4	Drawing of required line from point P to mid-point of QR
Q14.	4	Lines radiating through point P
	4	Locating four image points
	2	Drawing of image figure
Q15.	6	Six points identified correctly in elevation
	4	Correct syntax for indexing (lower case letters and subscript number)

Section B

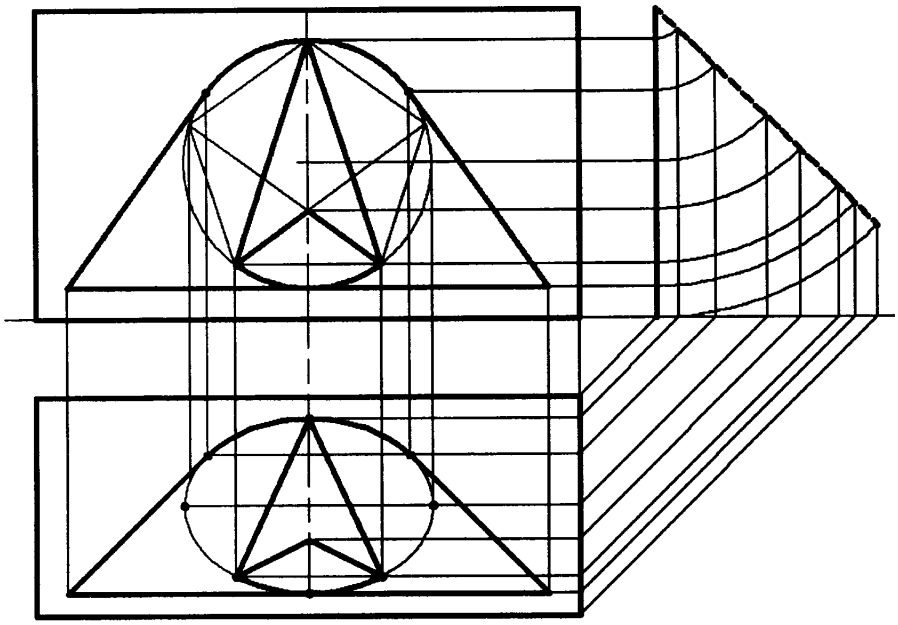
Q.1 Section B — Orthographic Projection



9	Orthographic Projection in 1st or 3rd angle (-3 in the case of a misplaced view)
	Elevation (12)
12	Twelve lines, 1 mark per line.
	End View (12)
12	Ten orthogonal lines @ 1 mark each, sloping line 2 marks
	Plan (10)
10	Eight orthogonal lines @ 1 mark each, sloping line 2 marks
	Auxiliary Elevation (19)
4	X1—Y1 (deduct 2 marks for incorrect angle)
4	Projections from plan (deduct 2 marks if not perpendicular to X1—Y1)
5	Applying five heights, taken from elevation.
4	Completion of auxiliary elevation (marks proportional to level of completion)
2	Hidden detail in auxiliary elevation (1 mark if line is not broken)
8	**Draughtsmanship**

Total marks = 70

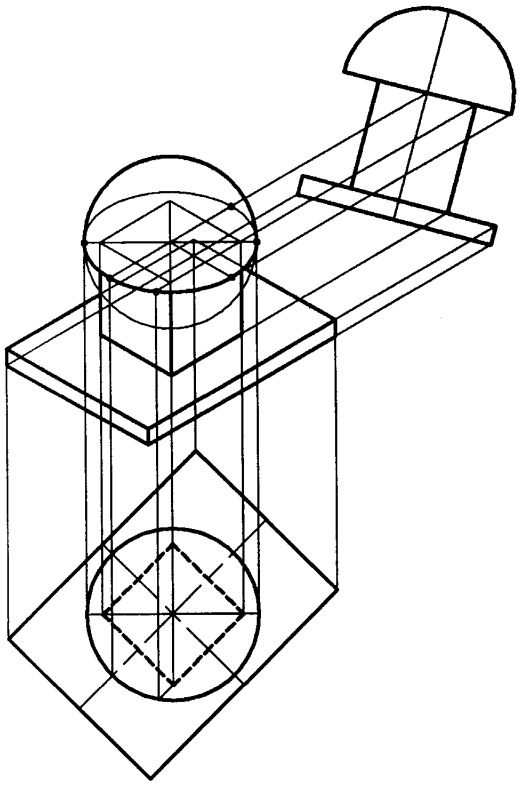
Q.2 Section B — Mapping



	Elevation (27)
4	Rectangle
3	Circle (1 mark for centre, 2 marks for drawing)
6	Three tangential lines (2 marks each).
3	Location of points of contact (1 mark each)
3	Angle required for construction of pentagon (i.e. 36°, 54° or 72°)
4	Location of remaining four vertices on pentagon
4	Internal lines (within the pentagon). 1 mark each.
	End View (3)
3	1 mark for vertical line, 2 marks for sloping line at correct angle of 45°
	Plan (32)
6	Method of projection from elevation and end view to the plan. (1,1,1,1,1,1)
4	Projected rectangle
9	Location of nine key points on projected design.
6	Drawing of both elliptical curves (3 marks each)
3	Three tangential lines (1 mark each)
4	Four internal lines. (1 mark each).
8	**Draughtsmanship**

Total marks = 70

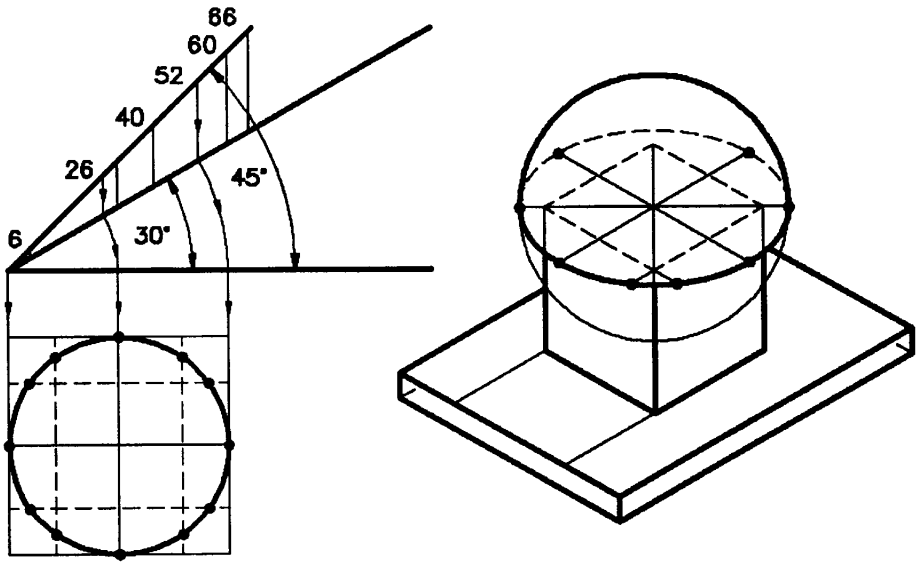
Q.3 (a) Section B — Isometric Projection (Axonometric Axes Method)



	Axonometric Axes Method
3	Axes (1,1,1)
	Plan (15)
5	Setting-up (2 for position and 3 for orientation at 45°).
10	Completion of plan (8 for lines, 2 for circle).
	Side Elevation (14)
5	Setting-up (2 for position and 3 for orientation at 15°).
9	Completion of side elevation (7 for lines, 2 for semi-circle).
	Completion of Isometric Projection (30)
9	Base of paper weight (1 mark per line).
5	Square based prism (1 mark per line).
6	Projection of hemi-sphere (Centre 2, correct radius 2, drawing 2).
8	Location of points on base of hemi-sphere (Axes end-points 4, other points 4).
2	Drawing of curve to represent base of hemi-sphere.
8	**Draughtsmanship**

Total marks = 70

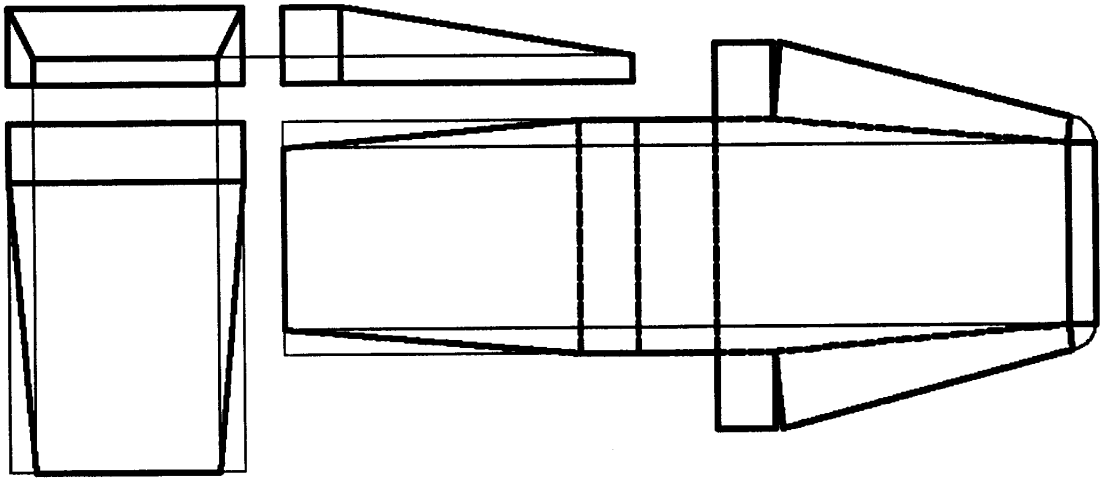
Q.3 (b) Section B — Isometric Projection (Isometric Scale Method)



Isometric Scale Method	
	Isometric Scale (18)
6	Setting up isometric scale (3 marks for 30° line and 3 marks for 45° line)
6	Applying dimensions on 45° line
6	Projecting from 45° line onto 30° line
	Projection of Sphere (5)
2	Drawing projection of sphere (circle) as a separate diagram.
3	Division of projected sphere (circle) in order to assist in the location of points.
	Isometric Projection (9)
3	Direction of axes (1,1,1)
6	Axes lengths applied from isometric scale (2,2,2). Deduct 3 marks if full size.
	Completion of Isometric Projection (30)
9	Base of paper weight (1 mark per line).
5	Square based prism (1 mark per line).
6	Projection of hemi-sphere (Centre 2, correct radius 2, drawing 2).
8	Location of points on base of hemi-sphere (Axes end-points 4, other points 4).
2	Drawing of curve to represent base of hemi-sphere.
8	**Draughtsmanship**

Total marks = 70

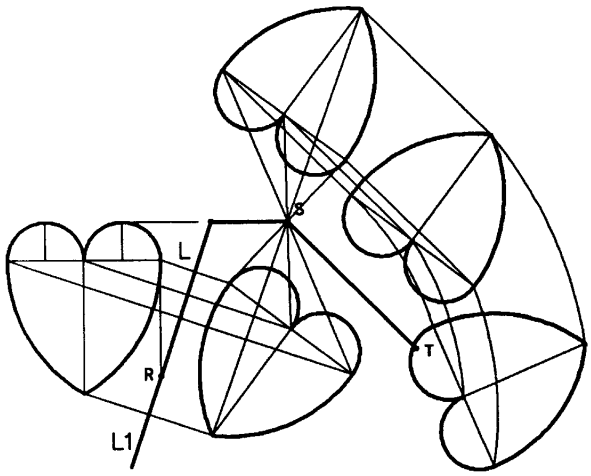
Q.4 Section B — Development



	Plan (9)
4	Outline (Perimeter lines only, 1 mark each).
2	95° angle(s). (Deduct 1 mark for an incorrect angle)
3	Completion of plan (Two sloping lines and one horizontal line)
	End View (8)
4	Outline (Perimeter lines only, 1 mark each).
2	10° angle. (Deduct 1 mark for an incorrect angle)
2	Completion of end view (One sloping line and one vertical line).
	Elevation (9)
4	Outline (Perimeter lines only, 1 mark each).
5	Completion of elevation (Two sloping, two vertical and one horizontal line).
	Development (36)
6	Base (1 mark per line).
6	Development of tapered sides. (Note use of 90° angle or establishing length)
10	Five rectangular surfaces (2 marks each).
6	Development of sloping top.
4	Indicating fold lines (Use of broken lines)
4	Layout of development
8	**Draughtsmanship**

Total marks = 70

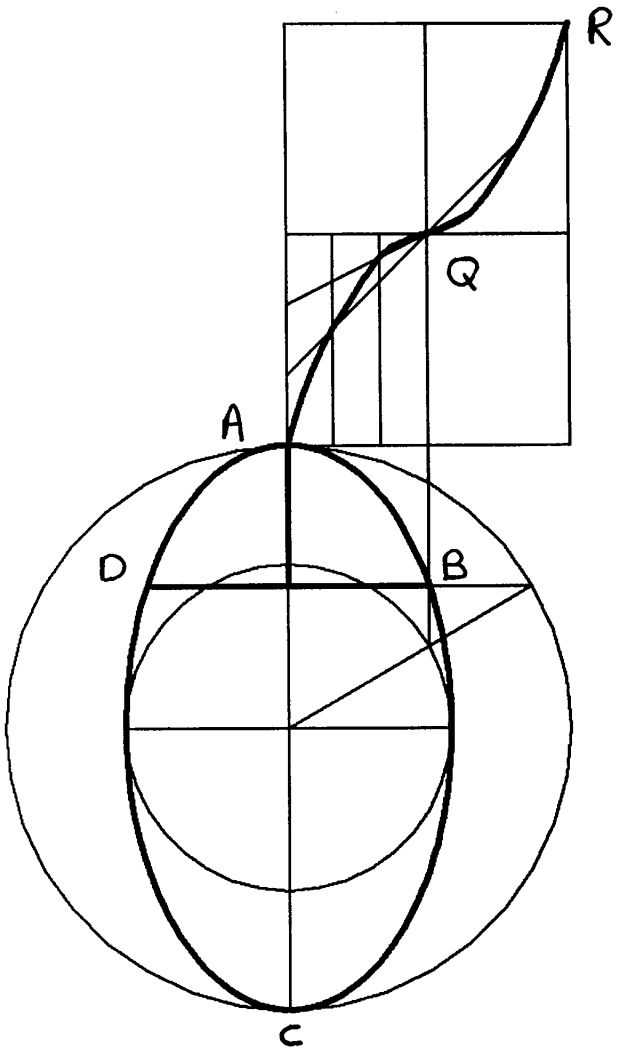
Q.5 Section B — Transformation Geometry



	Setting up (10)
4	Drawing the heart shaped figure.
6	Line L - L1 (2 marks). Locating the additional points S and T (2 marks each).
	Axial Symmetry (12)
4	Projecting perpendicular to line L – L1. (Deduct 2 marks if not perpendicular)
4	Locating four key image points.
4	Drawing image figure.
	Central Symmetry (12)
4	Lines radiating through point S.
4	Locating four key image points.
4	Drawing image figure.
	Translation (12)
4	Lines parallel to S-T. (Deduct 1 mark for incorrect direction or distance)
4	Locating four key image points.
4	Drawing image figure.
	Rotation (16)
4	Arcs, centre R. (Deduct 1 mark if centre R is not used).
4	Apply 35° angle of rotation. (Deduct 1 mark for an incorrect angle).
4	Locating four key image points.
4	Drawing image figure.
8	**Draughtsmanship**

Total marks = 70

Q.6 Section B — Ellipse and Parabola



	Outlines (10)
8	All outlines as shown on given figure (1 mark each).
	Ellipse (30)
20	Construction to determine minor axis (4,4,4,4,4 for concentric circles method).
6	Locating additional points on the curve.
4	Drawing the elliptical curve.
	Parabola (24)
16	Construction to determine points on semi-parabola(s). (4,4,4,4).
8	Drawing of semi-parabolas QA and QR. (4 marks each).
8	**Draughtsmanship**

Total marks = 70

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA **S61A**

A JUNIOR CERTIFICATE EXAMINATION, 2001

TECHNICAL GRAPHICS — HIGHER LEVEL

SOLUTIONS

Examination Number	Centre Stamp
☞	☞

INSTRUCTIONS

(a) Answer <u>any twelve</u> of the short answer questions in Section A (120 marks) using the spaces provided. All questions in Section A carry equal marks.

(b) Answer <u>any four</u> of the six questions in Section B (280 marks). All questions in Section B carry equal marks.

(c) Examination Number must be distinctly marked <u>in the space provided above</u> and on each sheet of paper used.

(d) All construction lines must be clearly shown.

(e) All measurements are in millimetres.

(f) Hand up this answer book (Section A) at the end of the examination.

For Examiner's Use Only		
QUESTION		**MARK**
Section A (Total)		
Section B	**Q1**	
	Q2	
	Q3	
	Q4	
	Q5	
	Q6	
TOTAL	➡	
GRADE	➡	

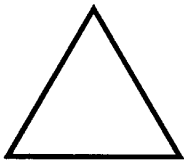
<u>WARNING</u>

THIS ANSWERBOOK MUST BE HANDED UP AT THE END OF THE EXAMINATION OTHERWISE MARKS WILL BE LOST.

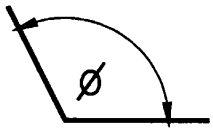
Over ☞

1. Correctly fill in the labels for each of the diagrams by selecting from the table shown.

TABLE				
Acute	Equilateral	Isosceles	Obtuse	Scalene

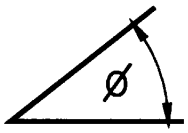


Equilateral

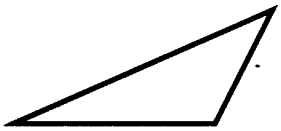


Obtuse

Isosceles

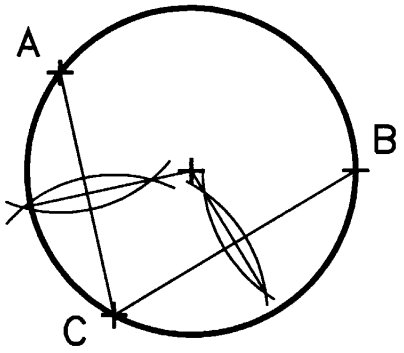


Acute

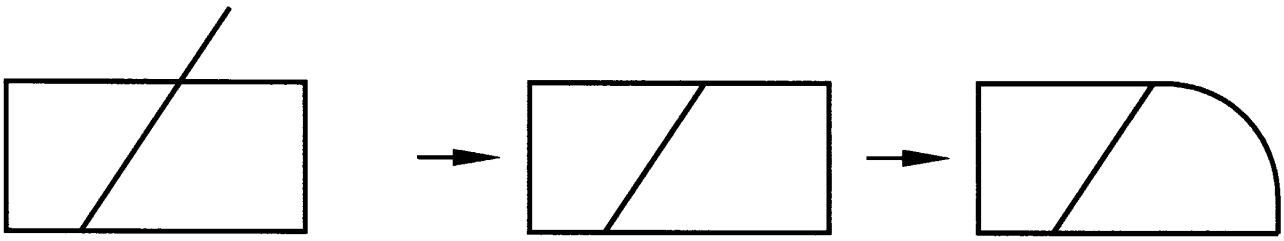


Scalene

2. Construct a circle to pass through the three given points A, B and C.

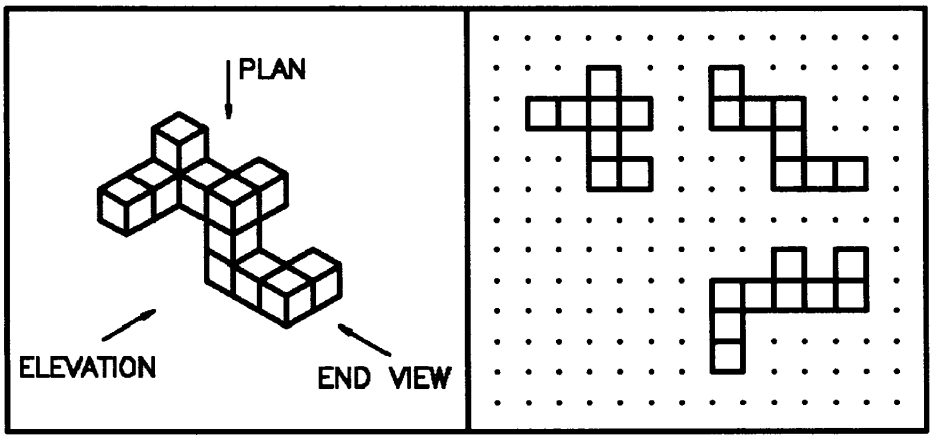


3. List the CAD commands used to edit the figure as shown in the sequence below.

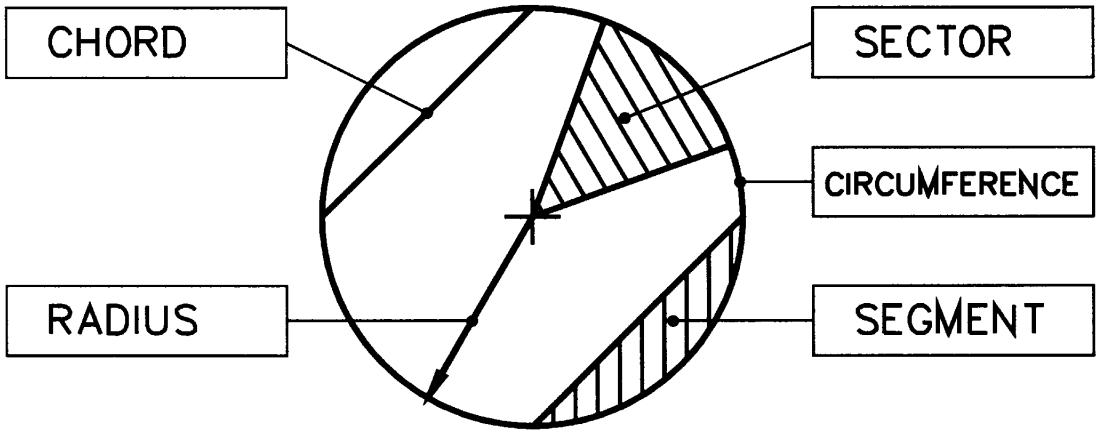


Commands used: Trim Fillet

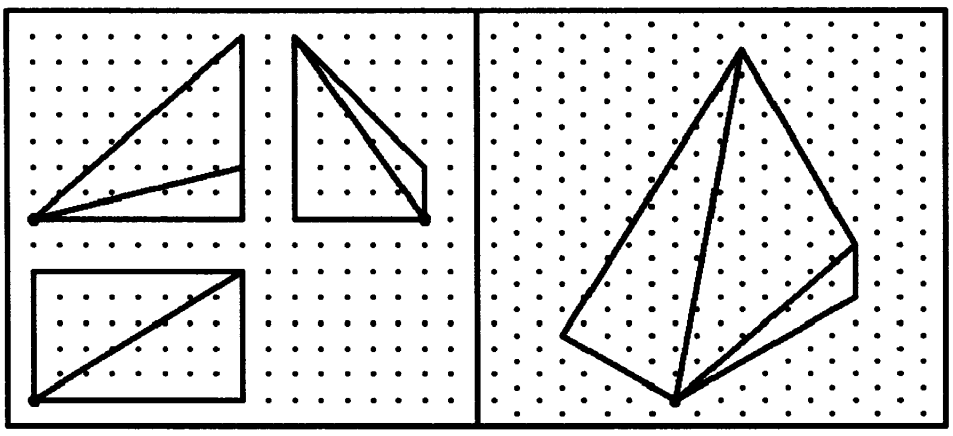
4. Using the square grid, sketch the orthographic views when viewed in the direction of the arrows.



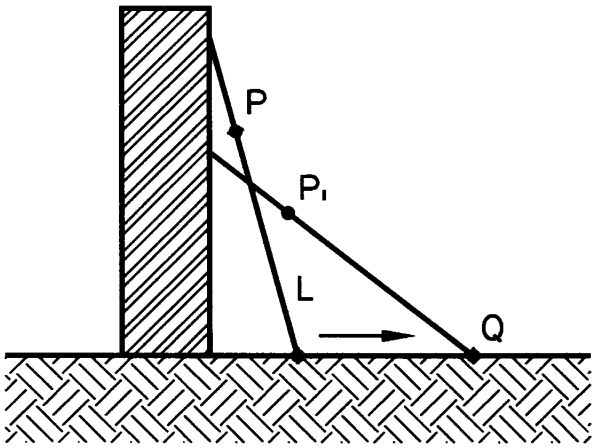
5. Label the parts of the circle shown.



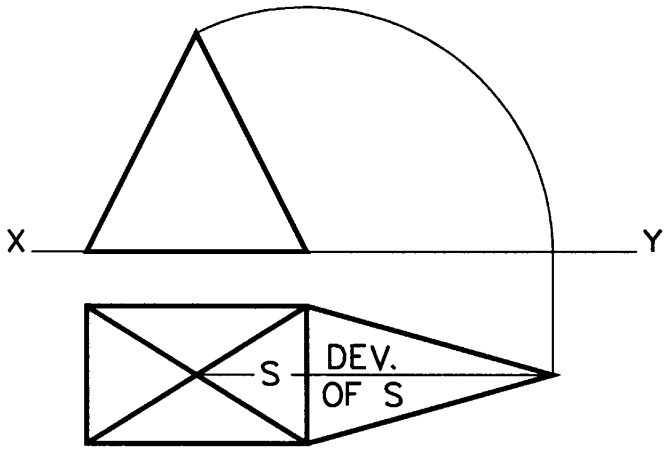
6. Shown on the square grid are three orthographic views of an object. The incomplete pictorial sketch of the object is shown on the isometric grid. Complete the pictorial sketch.



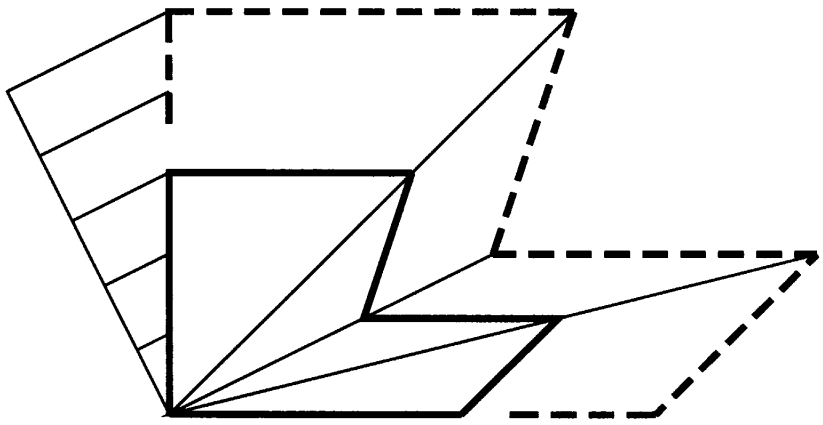
7. The line L represents a ladder leaning against a wall. Determine the location of the point P on the ladder when the base of the ladder is repositioned at Q.



8. The projections of a pyramid are shown. Draw the development of the surface S.

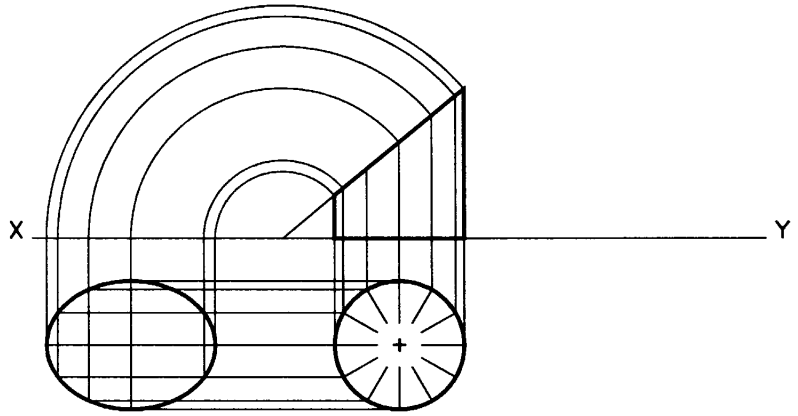


9. Enlarge the sides of the given figure in the ratio 3:5.

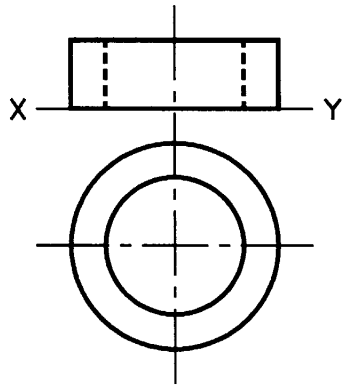


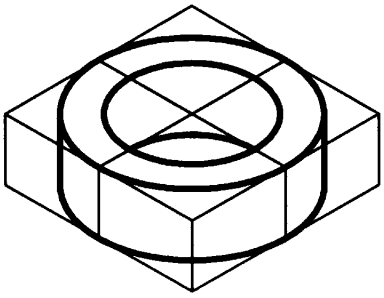
Over ☞

10. The elevation and plan of a truncated cylinder are shown. Develop the true shape of the cut surface S of the cylinder.

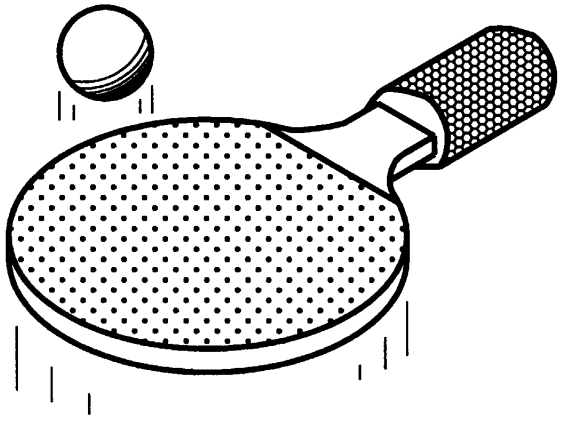


11. The elevation and plan of a ring are shown. Draw a <u>freehand</u> pictorial sketch of the ring in the space provided.



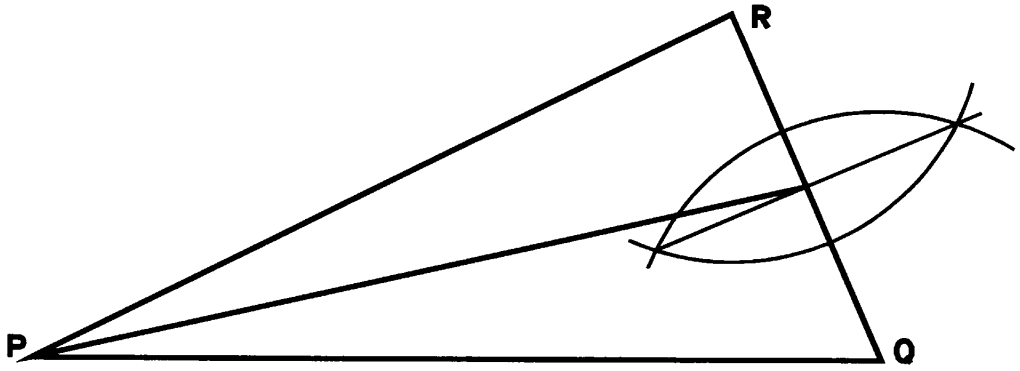


12. Apply shading to enhance the sketch of the table tennis bat and ball shown.

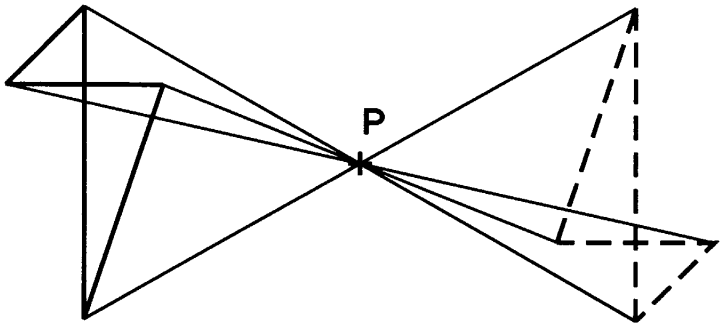


Over ☞

13. Draw a line from P which will divide the area of the triangle PQR into two equal parts.



14. Draw the image of the figure under central symmetry in point P.



15. The elevation and plan of a truncated pyramid are shown. All points in plan have been indexed. Correctly index the elevation.