

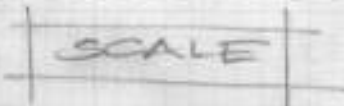
NORTH PACIFIC DESIGN
2727 HOLLYCROFT ST #410
Gig Harbor, WA 98335
(253) 858-8204 Fax (253) 858-3188

JOB CHAPTER 1
SHEET NO. 1 OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

CARTOGRAPHIC PROJECTION AND DESCRIPTIVE GEOMETRY

• DESCRIPTIVE GEOMETRY: IS THE GRAPHICAL SOLUTION TO THREE-DIMENSIONAL SPATIAL PROBLEMS, VIA SUCCESSIVE AUXILIARY PROJECTIONS.

• GASPARD MONTE: (1746 - 1818)
• 15 YEAR MILITARY SECRET



ARCHITECT'S SCALE

TYPICALLY DIVIDED INTO LINES THAT REPRESENT FOOT & INCHES.

REASONABLE SCALE:

$X = 1 - 0'' \Rightarrow$ WHERE 'X' IS THE FRACTIONAL PART OF THE SCALE.

1) IF (24) LINES ARE SHOWN;
 $12'' = 1'$; THEREFORE EACH LINE EQUALS $\frac{1}{2}''$

2) IF (12) LINES ARE SHOWN;
 $12'' = 1'$; THEREFORE EACH LINE EQUALS $1''$

3) IF (6) LINES ARE SHOWN; $12'' = 1'$; THEREFORE, EV. LINE EQUALS $2''$

ENGINEER SCALE

• EACH DIVISION IS DIVIDED INTO (10) EQUAL UNITS.

- EX. $1'' = 10'$
 $1'' = 20'$
 $1'' = 30'$
 $1'' = 40'$
 $1'' = 50'$

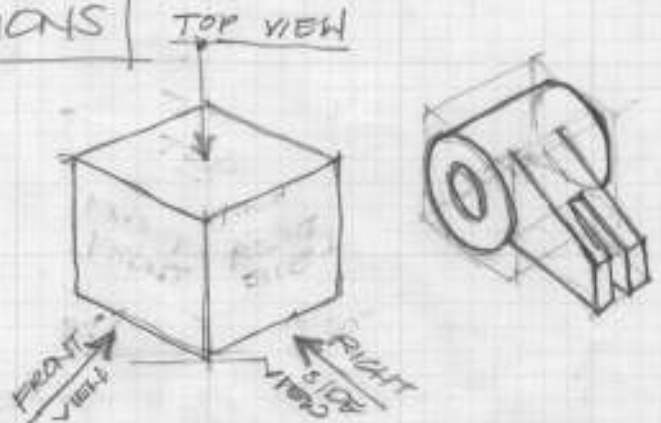
• $1'' = X$ OR $X = 1''$; WHERE 'X' IS THE NUMBER OF UNITS REPRESENTED BY EACH INCH.
• VALUE IS ALWAYS EQUAL TO $1''$
• $1''$ MAY REPRESENT .1, 1, 10, 100, 1000...

X PAPER SIZES & DIVISIONS. *

DEFINITIONS

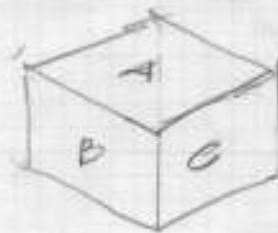
ISOMETRIC:

- A PICTORIAL VIEW SHOWING THREE SIDES OF AN OBJECT; TOP, FRONT, & RIGHT SIDE.
- $30^\circ, 30^\circ, 90^\circ$



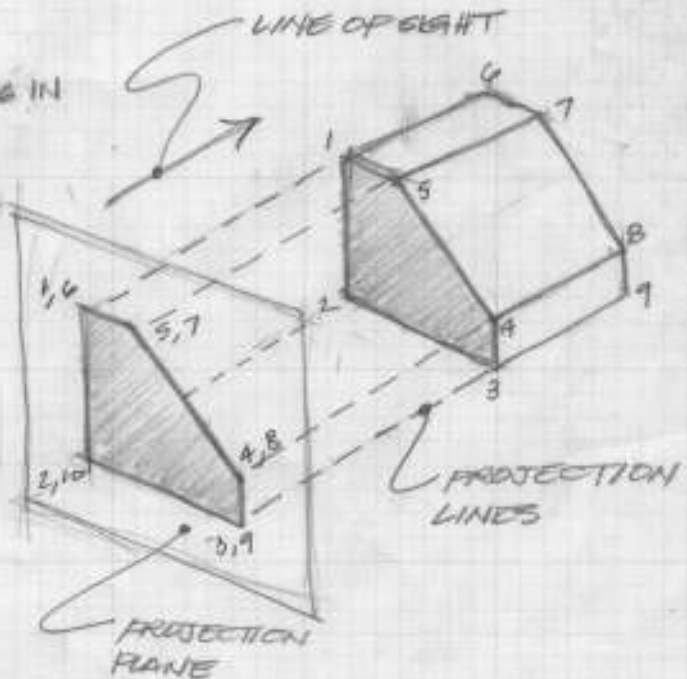
SURFACES:

- EXTERIOR FACES OF AN OBJECT
- SURFACE A, B, C



LINE OF SIGHT (LOS):

- AN IMAGINARY STRAIGHT LINE FROM THE EYE OF THE OBSERVER GOING IN A DIRECTION ON THE OBJECT TOWARD THE DIRECTION THE OBSERVER IS LOOKING



PROJECTION PLANE:

- A FLAT SURFACE THAT THE VIEW OF THE OBJECT IS PROJECTED ONTO.

PROJECTION LINES:

- LINES PERPENDICULAR TO THE PROJECTION PLANES AND PARALLEL TO THE LINES OF SIGHT.

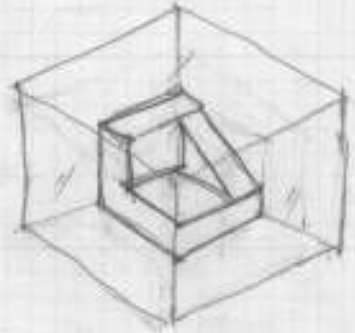
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DEFINITIONS

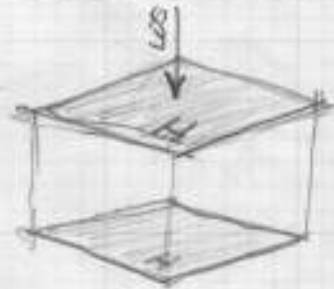
• TRANSPARENT BOX:

- A SIX-SIDED SEE THROUGH BOX REPRESENTS THE SIX PRINCIPLE PLANES



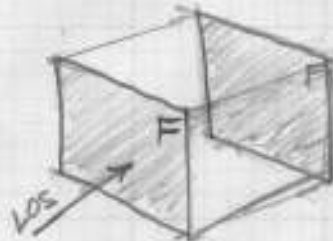
• HORIZONTAL PLANES (H)

- LEVEL PLANES -



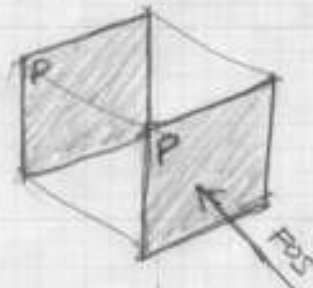
• FRONTAL PLANES (F)

- VERTICAL PLANE.



• PROFILE PLANES (P)

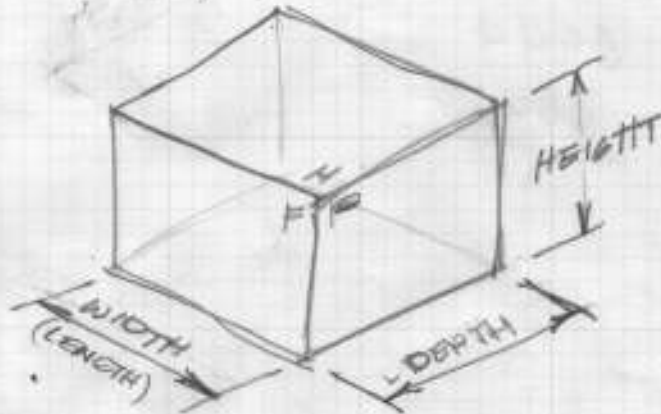
- VERTICAL PLANE
- PERP. TO FRONTAL



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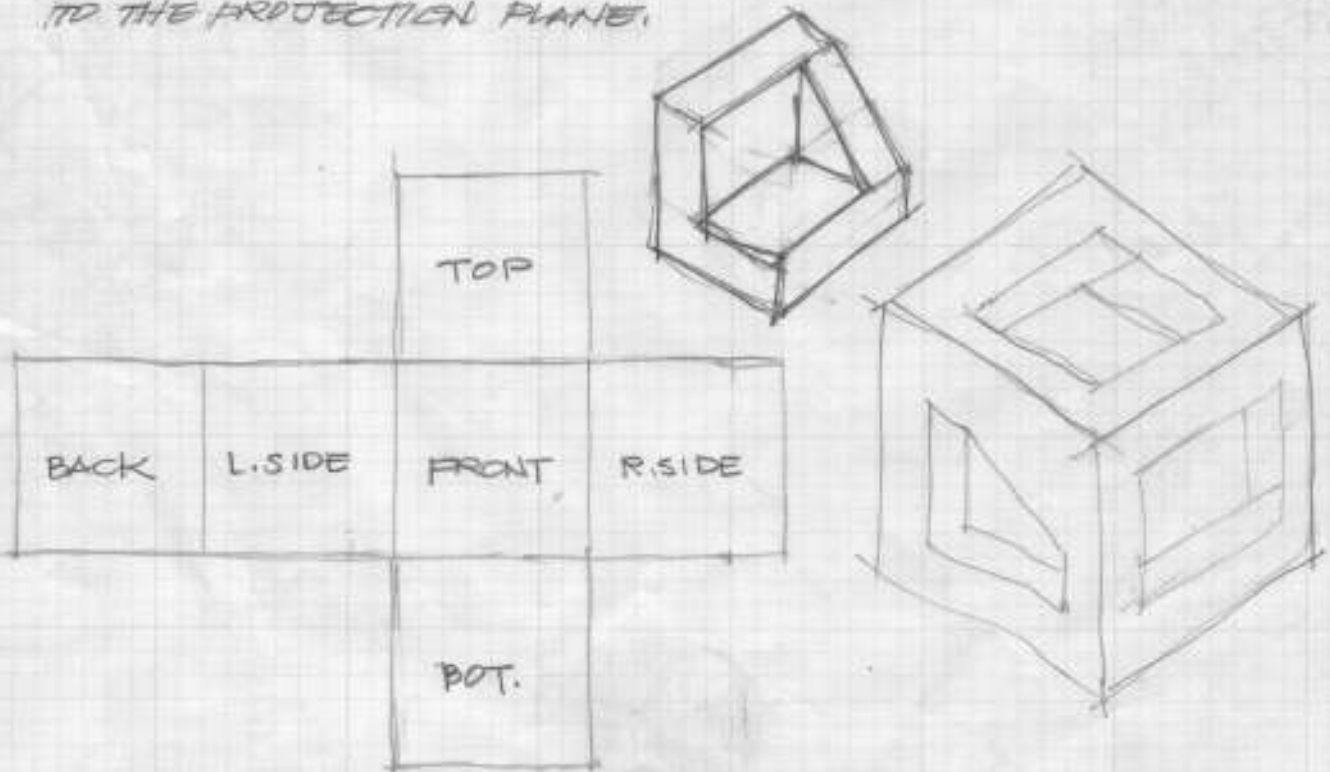
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DIMENSIONS



ORTHOGRAPHIC PROJECTION

MULTI-VIEWS OF AN OBJECT CREATED BY PROJECTING PARALLEL LINES FROM THE OBJECT, PERPENDICULAR TO THE PROJECTION PLANES.



• REFERENCE LINE: (FOLD-LINE)

* TALK ABOUT EXCEPTIONS

- HINGED LINE
- EDGES OF THE PLASTIC BOX
- MAY BE PLACED ANYWHERE
- ALL PROJECTION LINES WILL BE PERPENDICULAR TO IT.

H (PHANTOM LINE)
 F

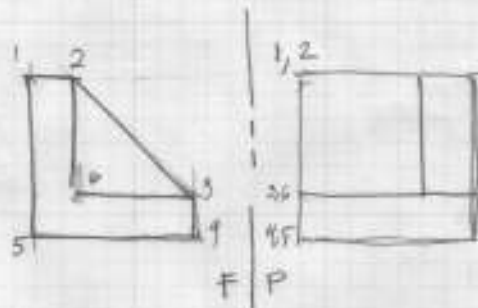
(MUST BE LABELED TO SHOW ITS ASSOCIATION BETWEEN THE PLANES.

- ORIGIN: STARTING POINT; MAY BE LOCATED ANYWHERE ON THE OBJECT.
 • LOWER LEFT CORNER X, Y, Z



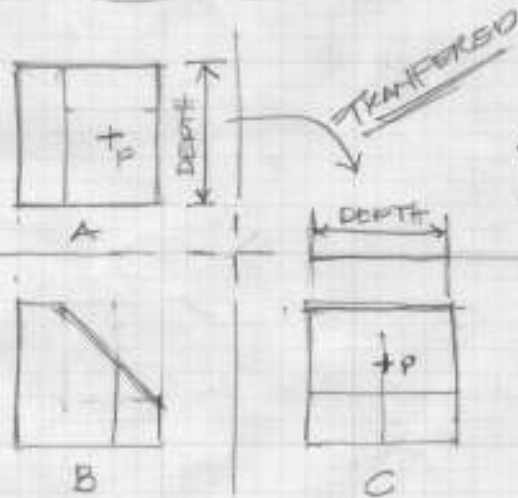
• ADJACENT VIEWS:

- VIEWS ALIGNED NEXT TO EACH OTHER AND SHARE A COMMON DIMENSION.



• RELATED VIEWS:

- VIEWS ADJACENT TO THE SAME VIEW SHARING A COMMON DIMENSION WHICH MUST BE TRANSFERRED.



A & C = RELATED VIEWS

• POINTS: +p

- INDICATE THE COORDINATES OF A LOCATION IN SPACE.

ISOMETRIC

1. $30^\circ \times 30^\circ \times 90^\circ$

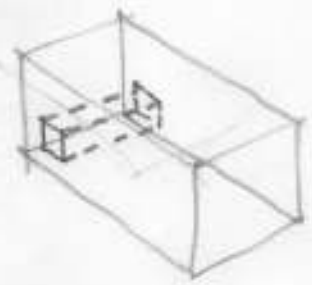


2. TRANSFER OVERALL DIMENSIONS:
LENGTH/WIDTH, HEIGHT, DEPTH.



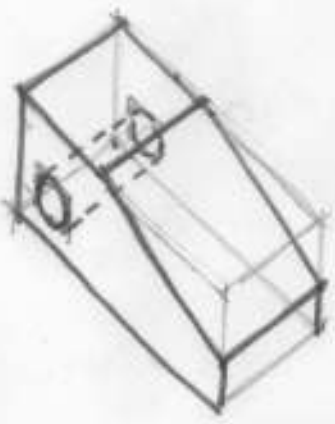
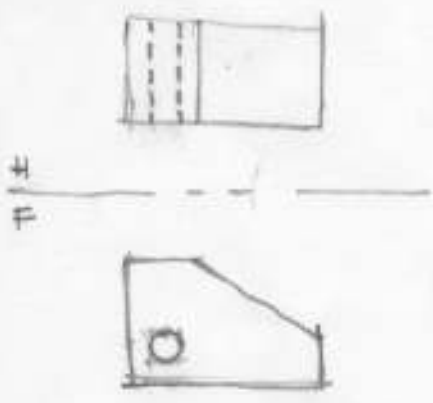
3. CREATE "TRANSPARENT BOX"

* ALL SIX SIDES SHOULD BE VISIBLE

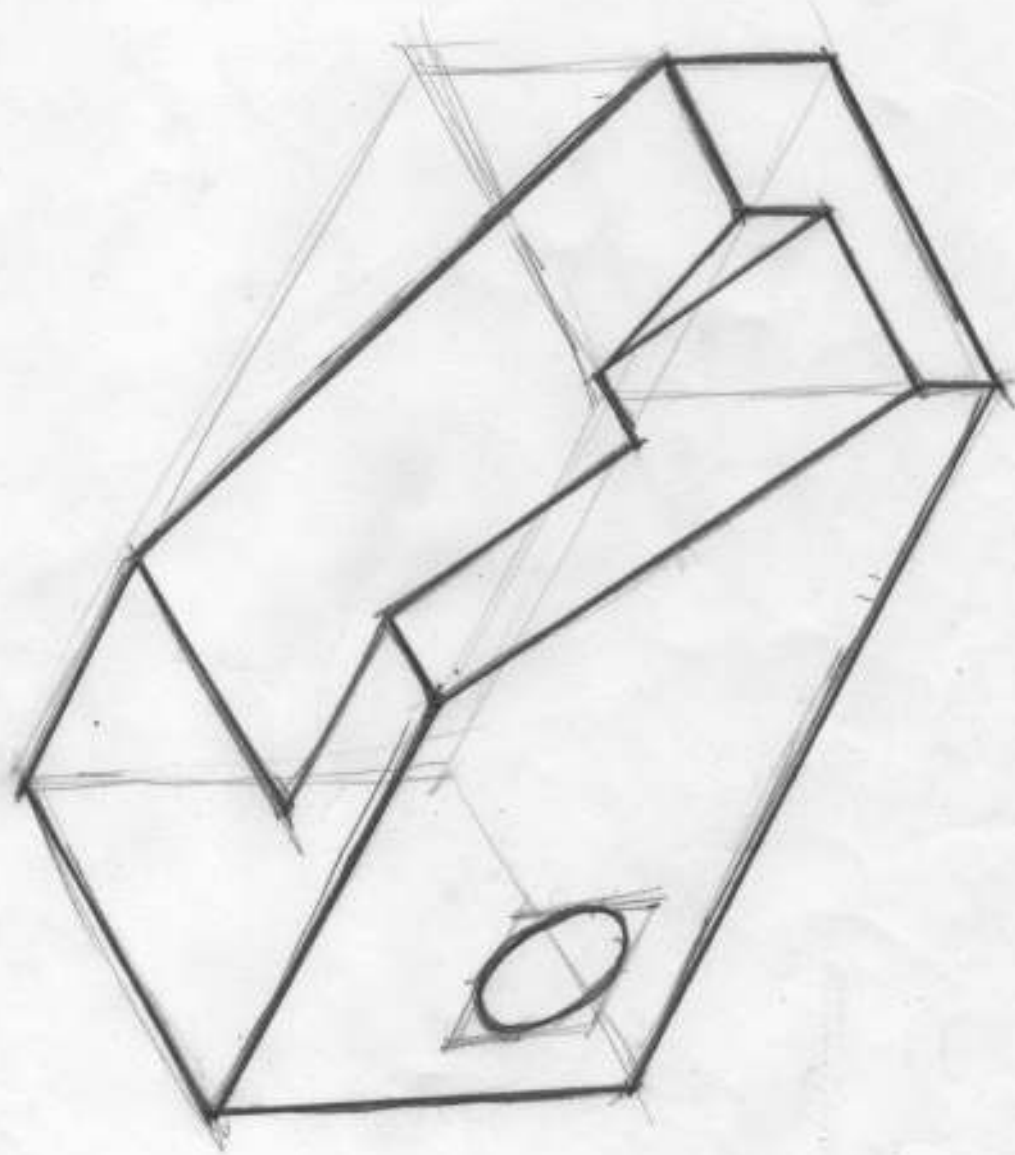


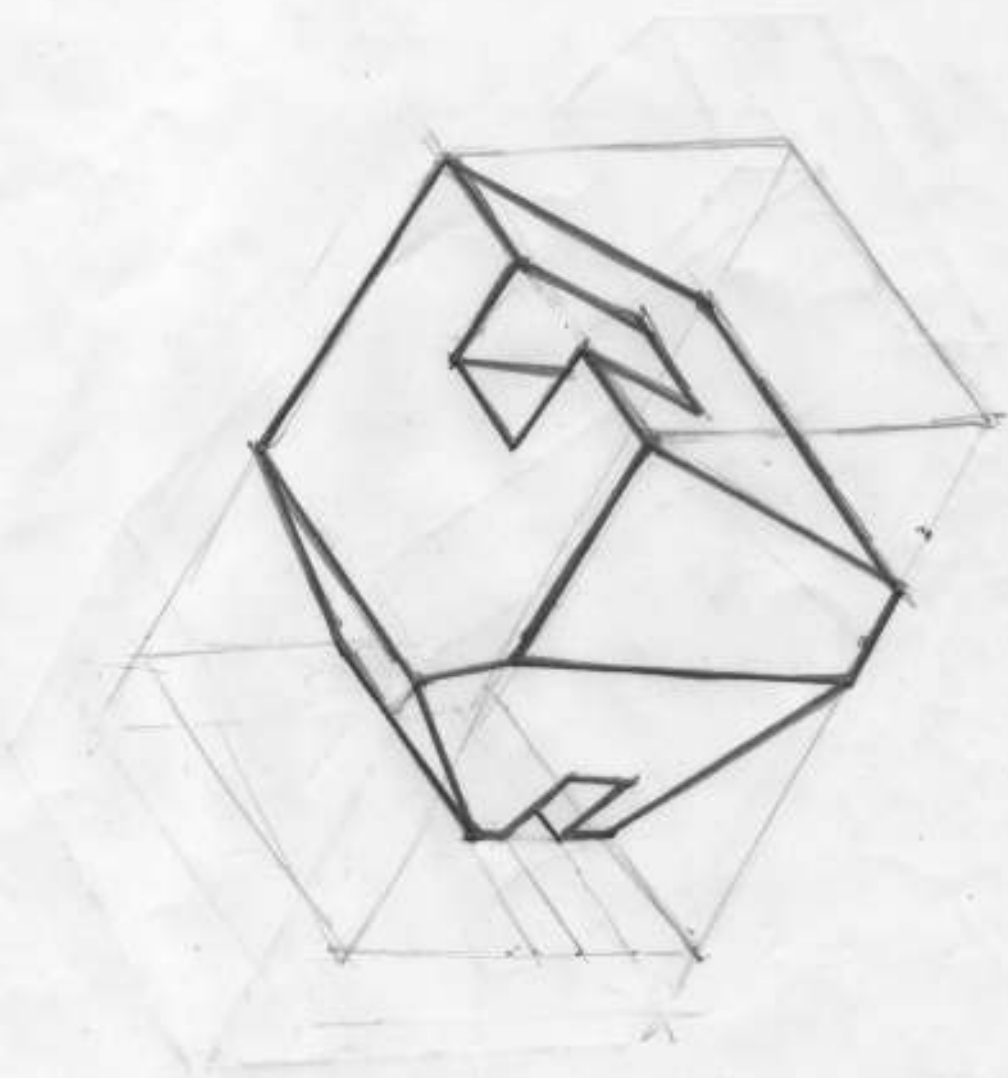
* GIVES YOU AN X-RAY VIEW.

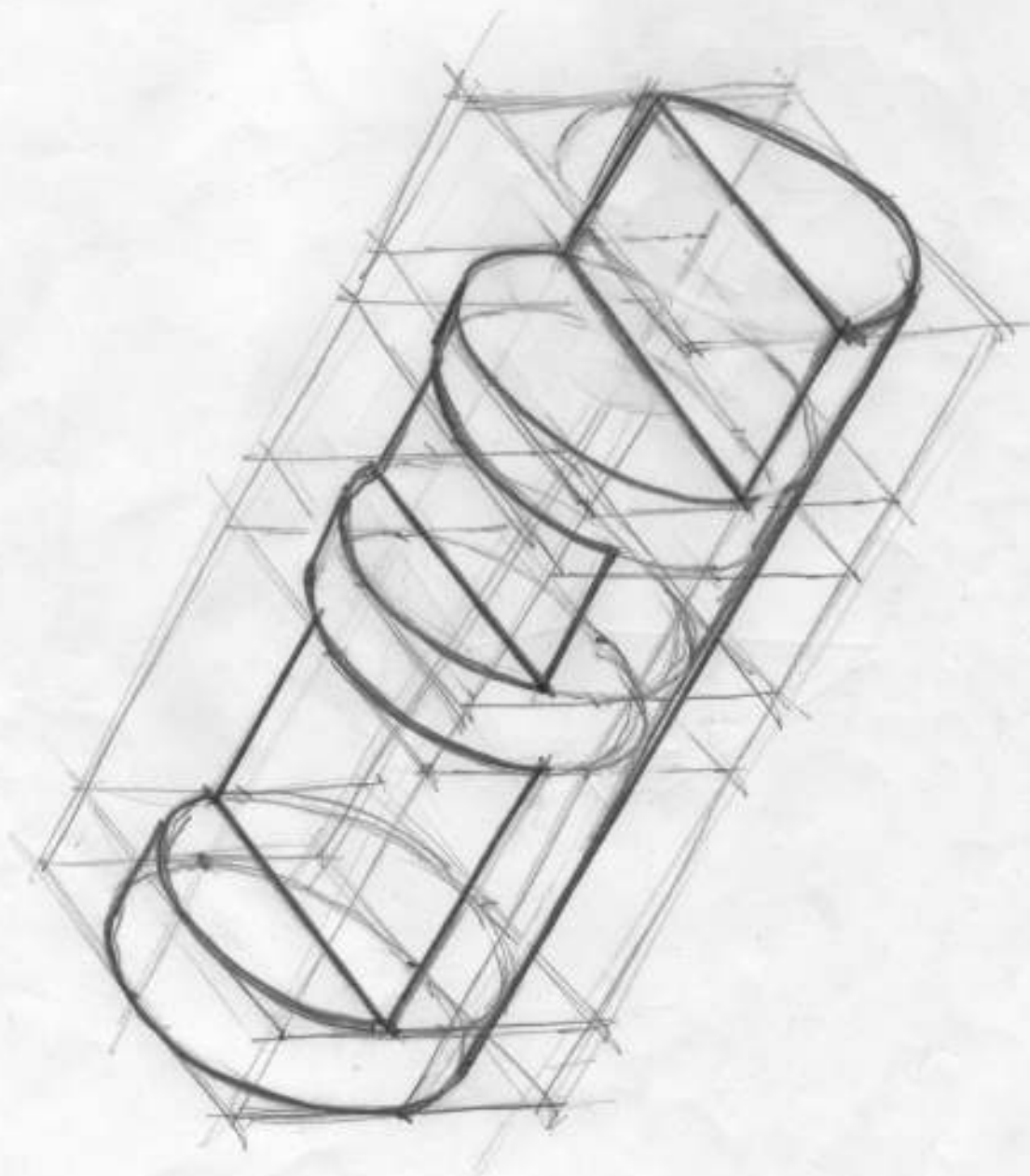
4. TRANSFER MEASUREMENTS TO APPROPRIATE SURFACES.

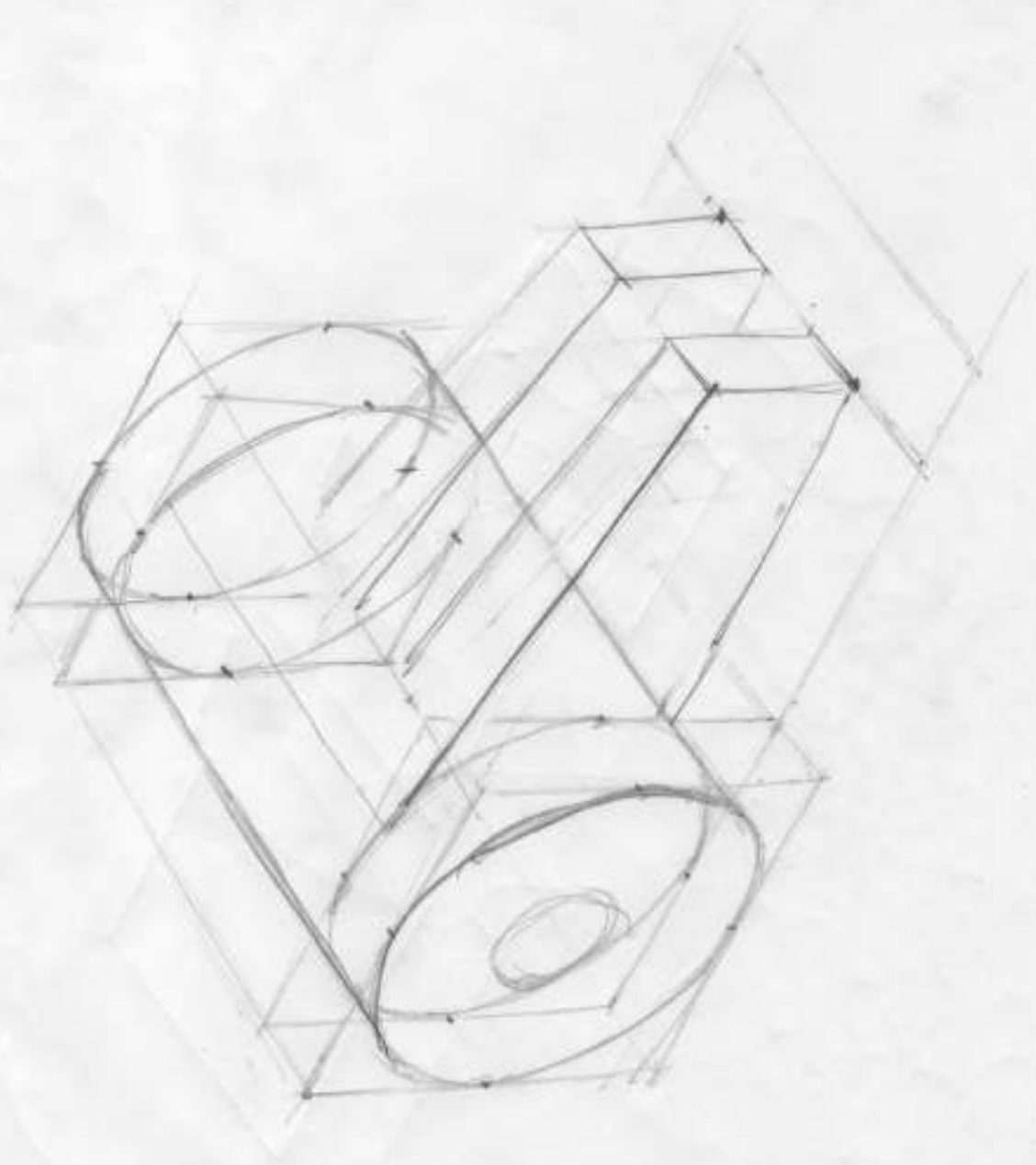


5. NOTE: ALWAYS BOX-OUT ALL CIRCLES









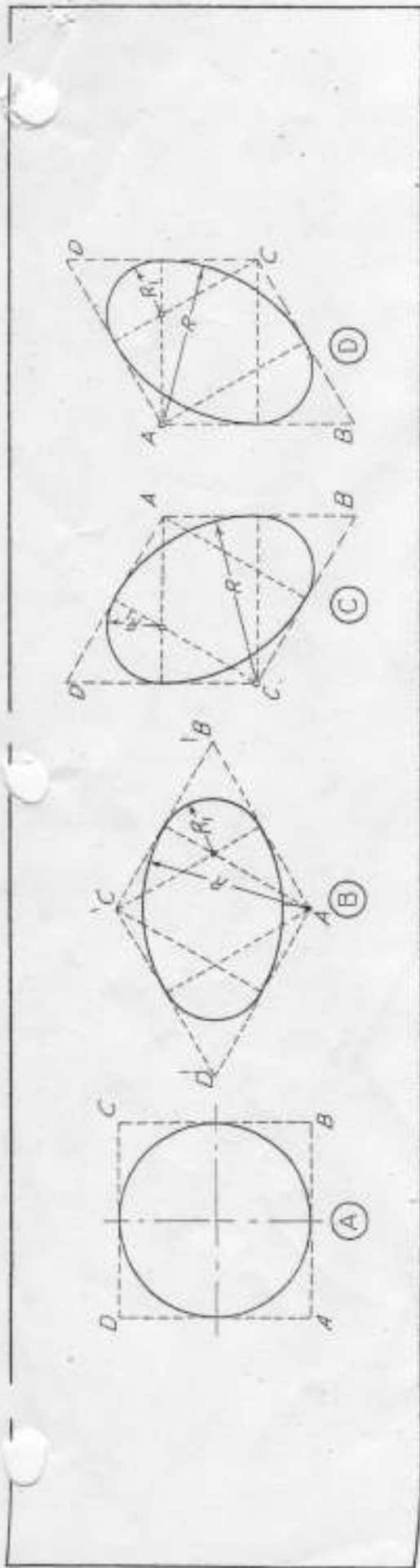


FIG. 15 Isometric circles, four-centered method.

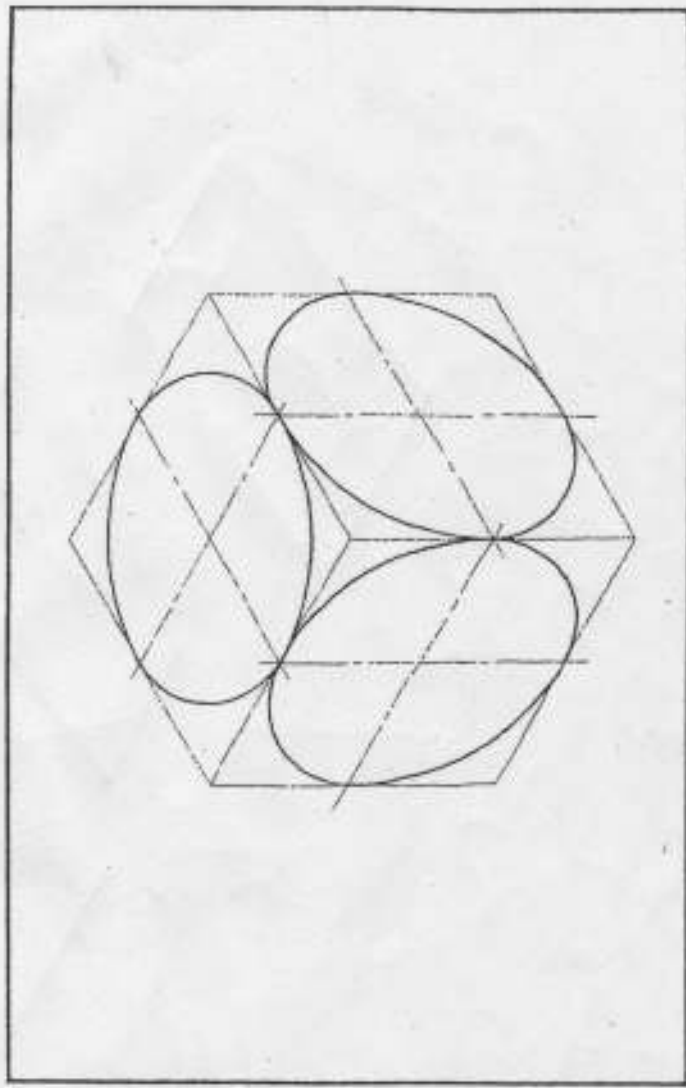


FIG. 55 Circles in isometric. Ellipses are tangent to the enclosing isometric squares at the mid-points of the sides.