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# Pictorials

- Parallel Projection
  - » Oblique Pictorials
    - Parallel projectors are not perpendicular to the projection plane
  - » Axonometric Pictorials
    - Projection lines are perpendicular to the projection plane as in a multiview drawing
    - Example is Isometric
- Perspective Projection
  - » Conveys information about distance and size
  - » Not as common as parallel projection

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# Pictorials

(A) Multiview Projection (B) Axonometric Projection (C) Oblique Projection (D) Perspective Projection

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# Axonometric views

**TRIMETRIC**  
No equal angles  
No equal corners

**DIMETRIC**  
Angles A and C are equal  
Corners MY and MX are equal in length

**ISOMETRIC**  
Angles A, B, and C are equal  
Corners MZ, MY, and MX are equal in length

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# Theory of isometric projection

(A) Orthographic views of a cube. (B) Cube rotated 45° about axis. (C) Cube rotated forward 35°16' (35.27°).

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# Isometric projection - drawing

80% isometric projection

Full scale isometric drawing

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# Size

Isometric projection

Isometric drawing approximately 20% larger

30°

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**Positions of isometric axes and their effect on the view created**

(A) Regular isometric      (B) Reversed axis isometric

(C) Long axis isometric      (D) Long axis isometric

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**Isometric and non-isometric lines**

Isometric lines      Nonisometric lines

Nonisometric plane      Isometric plane

Isometric axis      Isometric axis

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**An isometric drawing**  
Hidden lines are usually not shown

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**The basic steps used to create an isometric sketch of an object**

Step 1 Isometric axis      Step 2 Front face

Step 4 Top + side faces      Step 5      Step 6

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**Isometric representation of circles**

(B) Incorrect

Center point      Midpoints      Minor diameter      Major diameter

Step 1 Isometric Square      Step 2 Sketch Diagonals      Step 3 Locate Midpoints

Horizontal or top plane      Major axis      Minor axis

Major axis      Minor axis      Major axis      Minor axis      Profile plane

Step 4 Sketch Arcs      Step 5 Finish the Ellipse

(A) Correct

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**Fig. 1      Fig. 2**

Fig. 3      Fig. 4

Fig. 5      Fig. 6

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### Steps used to construct a sketch of an isometric cylinder

Step 1 Sketch Bounding Box  
Step 2 Sketch End of Cylinder  
Step 3 Sketch Far End of Cylinder  
Step 4 Sketch Sides of Cylinder  
Step 5 Complete the Sketch

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### Steps used to construct a sketch of a semi-ellipse

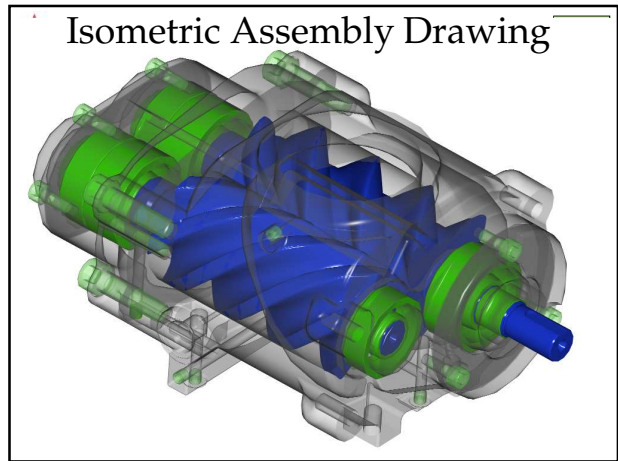
Step 1 Sketch Isometric Square  
Step 2 Sketch Second Arc  
Step 3 Complete the Sketch

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### Angles and irregular shapes in an isometric sketch

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## Oblique projection

(A) (B)

Oblique

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### Types and angles of oblique projections

Cavalier oblique      Cabinet oblique      General oblique

30°      45°      60°

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## How to generate oblique projection

**The construction of an oblique sketch is a multistep process that begins by boxing in the front view, adding details, and then boxing in the depth dimension**

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## Yes and No for oblique projections

Parallel to frontal plane  
Yes  
(A)

Not parallel to frontal plane  
No!  
(B)

Rule #1-Parallel to frontal plane  
Yes  
(A)

Longest feature perpendicular to frontal plane  
No!  
(B)

Longest feature parallel to frontal plane  
Yes  
(A)

Rule #2-Longest feature parallel to frontal plane  
No!  
(B)

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## Perspective projections

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## Vanishing point

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## Horizon line position

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## How to create a one point perspective?

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## Exercise DrE-2

