

**TERMS TO BE DEFINED OR IDENTIFIED for COMPETENCY 9:**

- Revolution
- Viewing planes
- Primary revolution
- Successive revolutions
- Plane
- True size
- Path of revolution
- True length lines
- True angle
- Dihedral angle
- Rectified length
- Helix
- Revolved view
- Axis of revolution
- Fold line
- Reference plane

**ITEMS FOR REVIEW FOR COMPETENCY 9:**

(The following information courtesy of Monterey Peninsula College)

**Principles of Descriptive Geometry Rule #1**

If a line is positioned *parallel to a projection plane* and the *line of sight is perpendicular to that projection plane*, then the line will appear as true length

**Principles of Descriptive Geometry Rule #2**

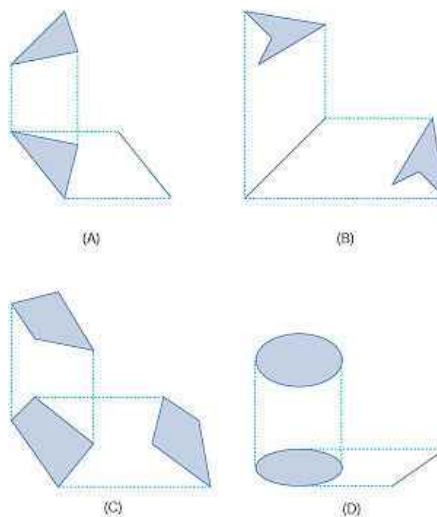
If the *line of sight is parallel to a true-length line*, the line will appear as a point view in the adjacent view.

Corollary:

Any adjacent view of a point of view of a line will show the true length of the line.

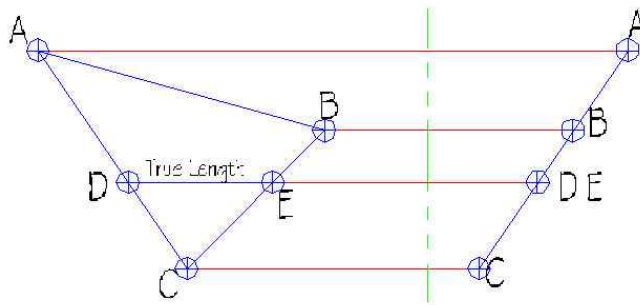
**Principles of Descriptive Geometry Rule #3**

Planar surfaces of any shape always appear either as edges or as surfaces of similar configuration.



### Principles of Descriptive Geometry Rule #4

If a line in a plane appears as a point, the plane appears as an edge



### Principles of Descriptive Geometry Rule #5

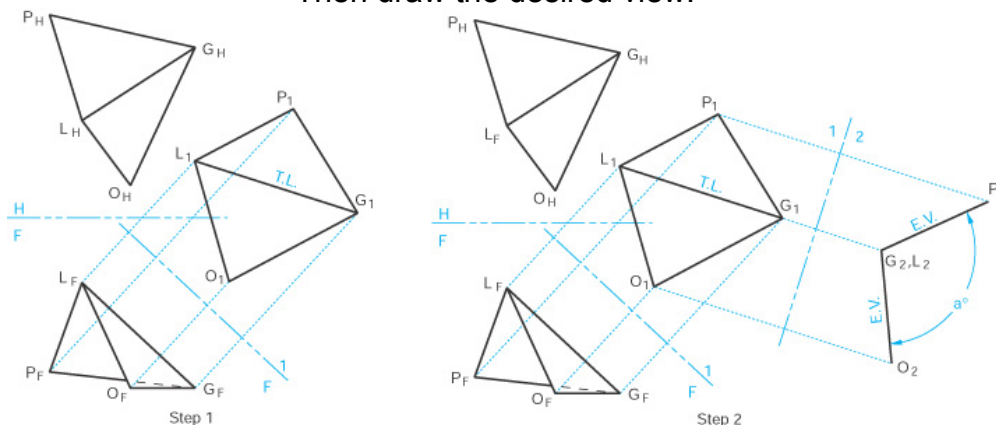
A true-size plane must be perpendicular to the line of sight and must appear as an edge in all adjacent views.

#### A Corollary to Rule #5

If a plane is true-size then all lines in the plane are true length and all angles are true.

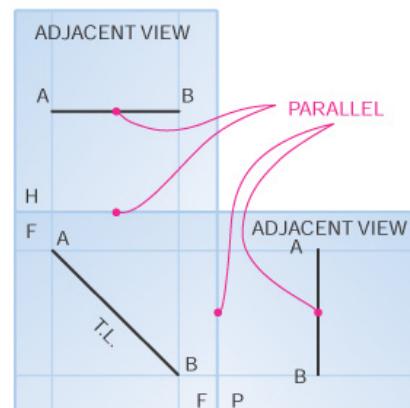
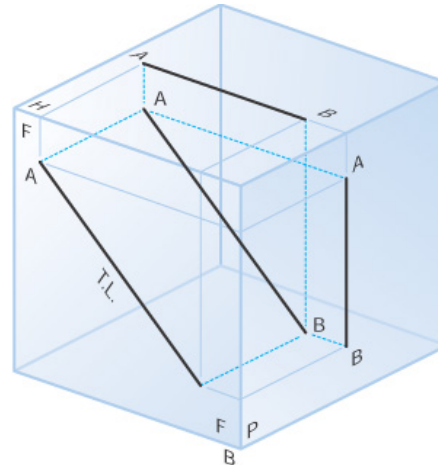
### Finding the Angle between Two Intersecting Planes

- The key is to create a view where BOTH planes are in edge view.
  - The common line between the planes is the intersecting line.
  - Create a view where the intersecting line appears as a point.
    - Start by drawing a view of the line in true length
    - Then draw the desired view.



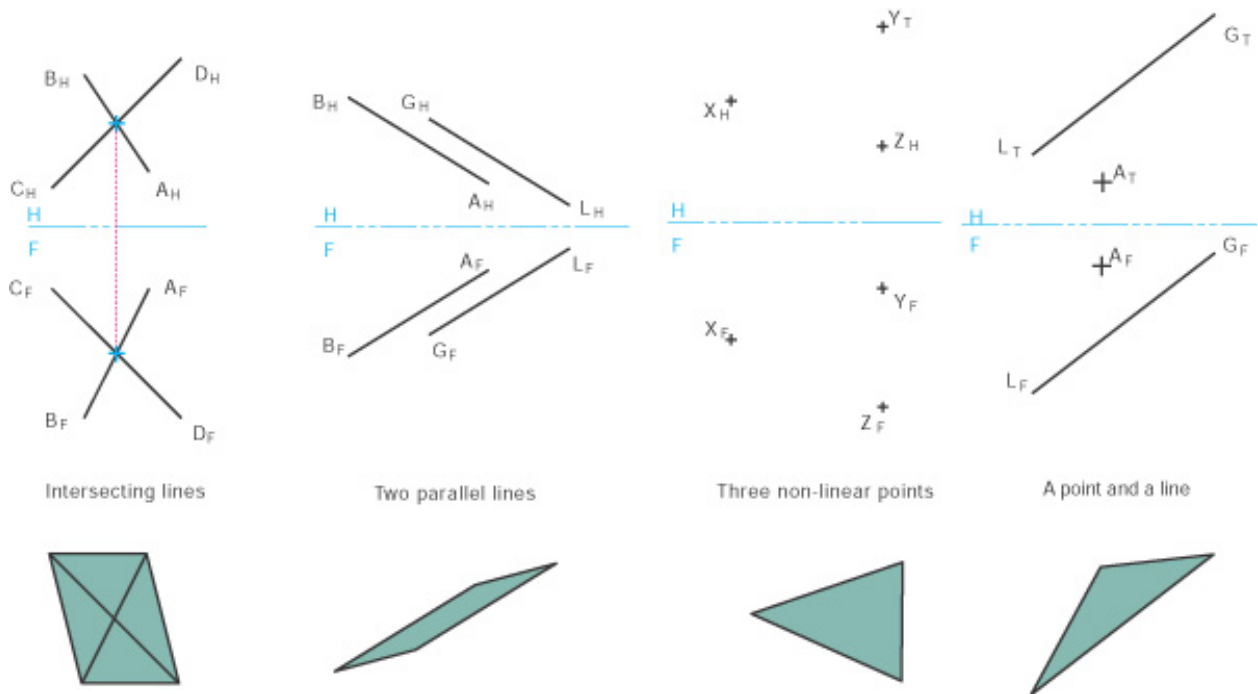
### True Length Lines

- True length lines are **ALWAYS** parallel to the reference plane in **ALL** adjacent views.
- To find the true length of a line, draw a view of the line where the reference plane is parallel to an adjacent view of the line.



## Planes

- Planes are surfaces that can be uniquely defined by:
  - Three non-linear points in space,
  - Two non-parallel intersecting vectors,
  - Two parallel vectors, or
  - A line and point not on the line.

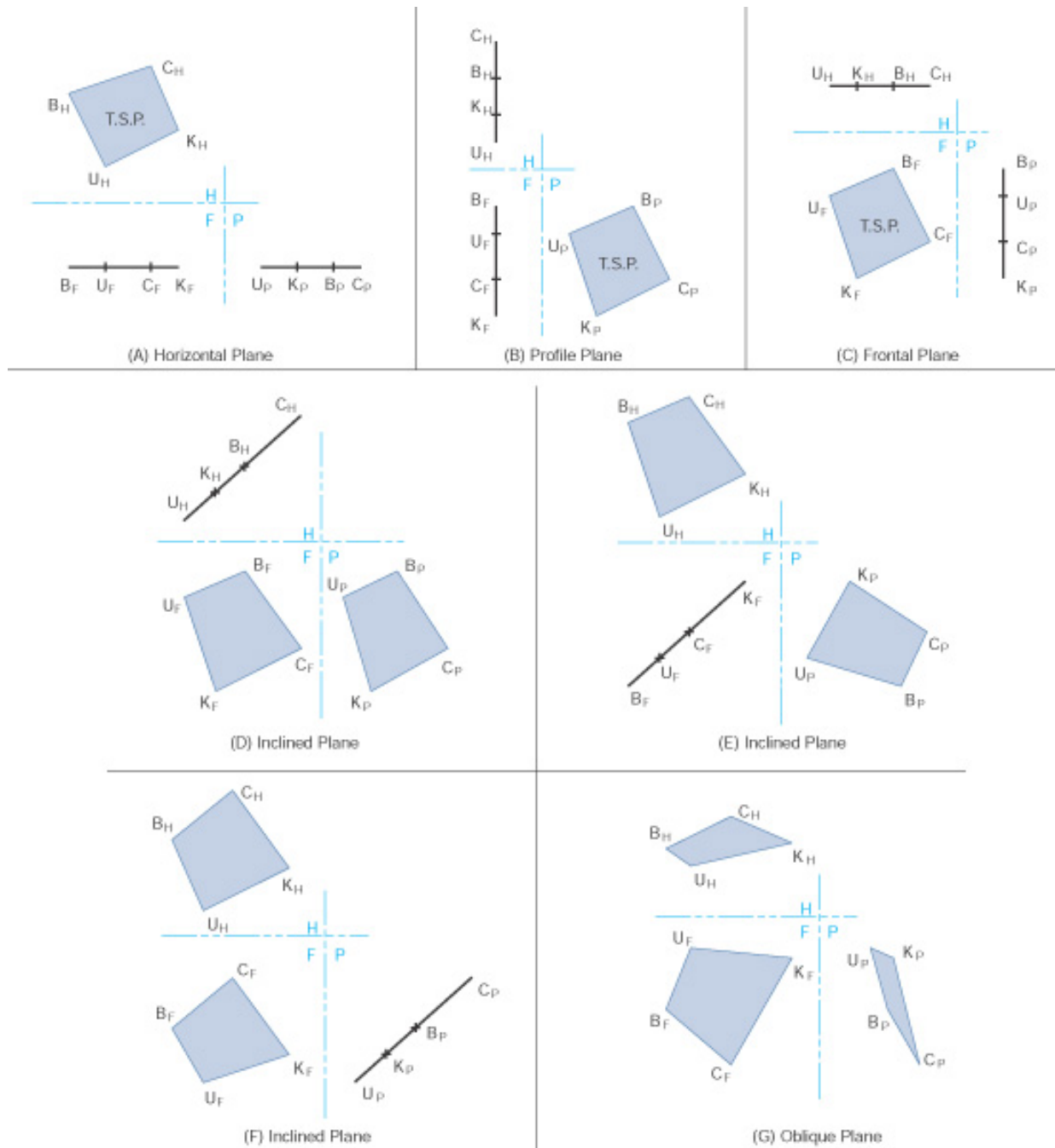


## Plane Classifications

- Planes are classified as
  - Horizontal
  - Vertical
    - Profile
    - Frontal
  - Inclined (perpendicular to a principle plane)
  - Oblique (not perpendicular to a principle plane)
- Horizontal and Vertical planes are principle planes.

**Plane Classification Examples**

- Orthographic representations of planes as they appear in the principle views



**SAMPLE REVIEW QUESTIONS**

1. A Fold line is best defined as:
  - The place where perpendicular viewing planes meet each other along the straight edge of intersection.
  - A surface line that is shown actual size.
  - Determines which line is shown if a center and hidden lines are in same location.
  - To form a mental picture or image.
  - Determines the line thickness for individual line types.
2. The true angle formed between a line and a principle plane may be found by using the revolution method.
  - True
  - False
3. To determine the true angle between two intersecting planes, the line of intersection must be:
  - True length
  - Oblique
  - At the same angle
  - A point view
4. A path of revolution cannot be obtained by revolving a point around an oblique axis.
  - True
  - False
5. If an object is revolved about a horizontal axis, perpendicular to the frontal plane, the Front view is unchanged in shape.
  - True
  - False
6. The true angle between two planes is known as:
  - Dihedral angle
  - Obtuse angle
  - Acute angle
  - Right angle
7. Identify the term created by a point rotating around an axis while moving along the axis:
  - Helix
  - Involute
  - Cycloid
  - Spiral