

Department of Education
SPTVE
TECHNICAL DRAFTING-8
Interpret Technical Drawings & Plans
Quarter 2 - Week 2 Module



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EXPECTATIONS

At the end of the module, the learner is expected to:

1. label the three planes of projections;
2. interpret orthographic views in a blueprint; and
3. appreciate the importance of interpreting technical drawings and plans.

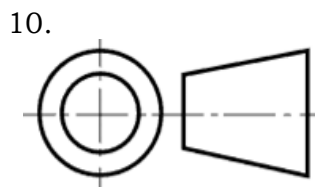


PRE-TEST

Directions: Encircle the letter of the correct answer.

1. It is a thick heavy line used to represent the visible edges of an object.
A. construction lines
B. crate lines
C. margin
D. object line
2. It is a vertically-aligned view with the top view in its projection.
A. front view
B. rear view
C. side view
D. top view
3. It is the terminating point of dimension line.
A. center line
B. dimension line
C. extension line
D. leader line
4. They are light-penciled line used in blocking-in the views.
A. center lines
B. crate lines
C. dimension lines
D. object lines
5. It is the standard height of numerical figures in dimensioning.
A. 2 mm
B. 3 mm
C. 4 mm
D. 5 mm
6. They are dashes of lines representing hidden edges or contour of the object.
A. chain lines
B. guide lines
C. invisible lines
D. phantom lines
7. An orthographic view which is horizontally aligned with the front view.
A. front view
B. rear view
C. side view
D. top view
8. It is the sum total of detailed dimensions.
A. detail dimension
B. estimated dimension
C. location dimension
D. size dimension

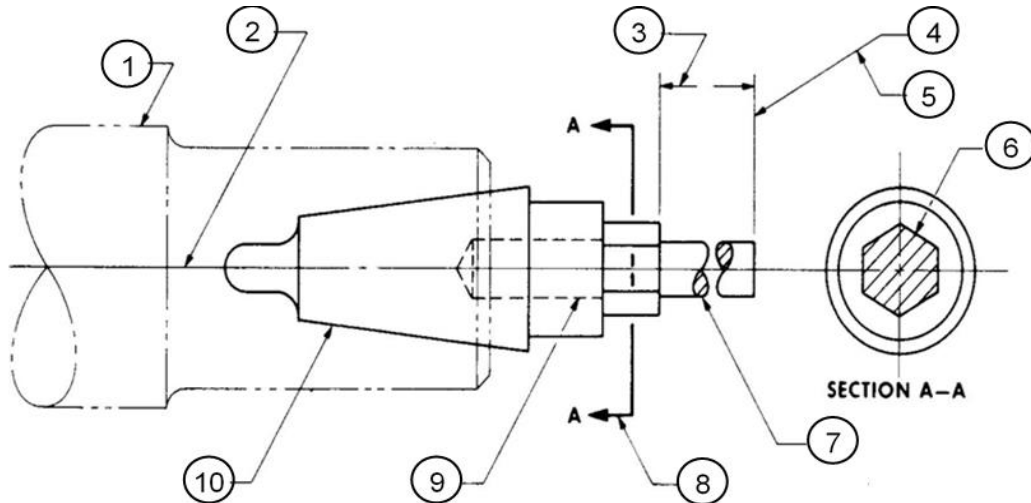
_____ } 9.
_____ } 10. They are the symbols of first and third-angle projection





LOOKING BACK

Directions: Identify the alphabet of lines used for the illustration below, then write your answer on the space provided for each number.



1. _____
2. _____
3. _____
4. _____

5. _____
6. _____
7. _____
8. _____

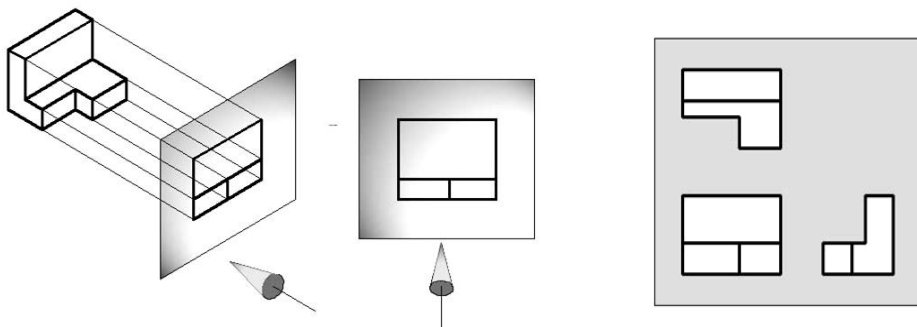
9. _____
10. _____



BRIEF INTRODUCTION

ORTHOGRAPHIC PROJECTION

An orthographic projection is a representation of separate views of an object on a two-dimensional surface. It reveals the width, depth and height of an object. The projection is achieved by viewing the object from a point assumed to be at infinity (an indefinitely great distance away). The line of sight or *projectors* are parallel to each other and perpendicular to the plane of projection.

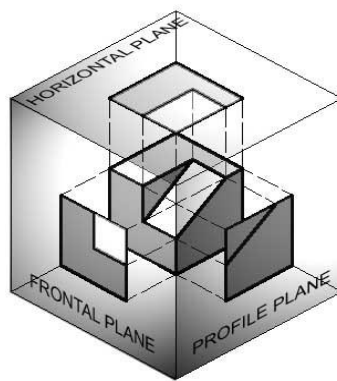


VISUALIZING ONE VIEW OF AN ORTHOGRAPHIC PROJECTION

THREE PLANES OF PROJECTION

One can develop the skill in visualizing the views of an object by imagining that the object is enclosed in a “glass box”. Each face of the object is viewed perpendicularly to the projection plane. The views are obtained by projecting the lines of sight to each plane of the glass box. Since the glass box has six sides, six views of the object can be seen.

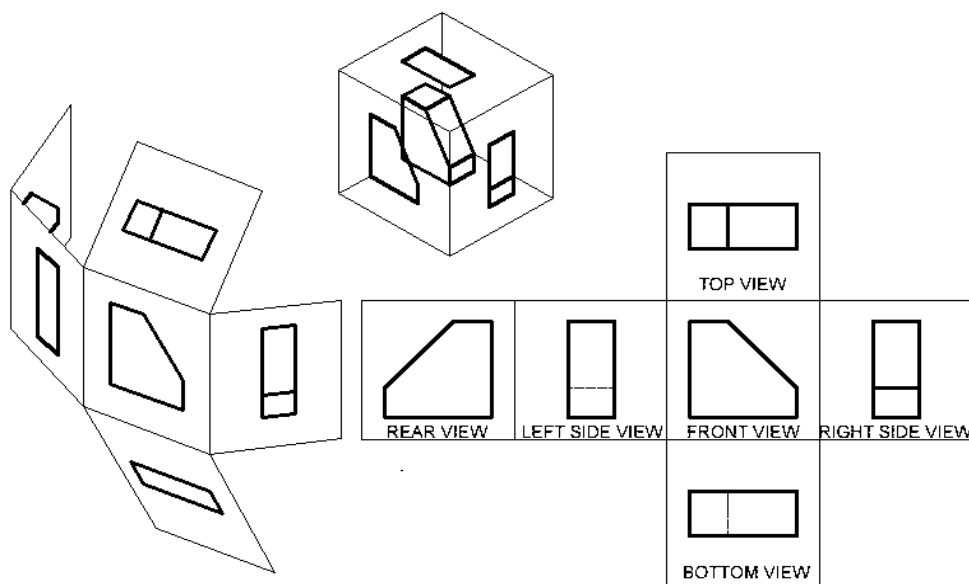
- ❑ **Frontal Plane.** The projection shown in the frontal plane is called front view or front elevation.
- ❑ **Horizontal Plane.** The projection shown in this plane is called top view or plan view.
- ❑ **Profile Plane.** A projection at this plane is called the side view or end view, or side or end elevation.



The glass box representing the planes of projection

Six principal views of an object

As we unfold the glass box, six views of the object are revealed: top, front, right-side, left-side, rear, and bottom view. We assumed that all of the pieces of the glass box are hinged to the front plane except the rear plane being hinged to the left-side plane, as shown in the illustration.

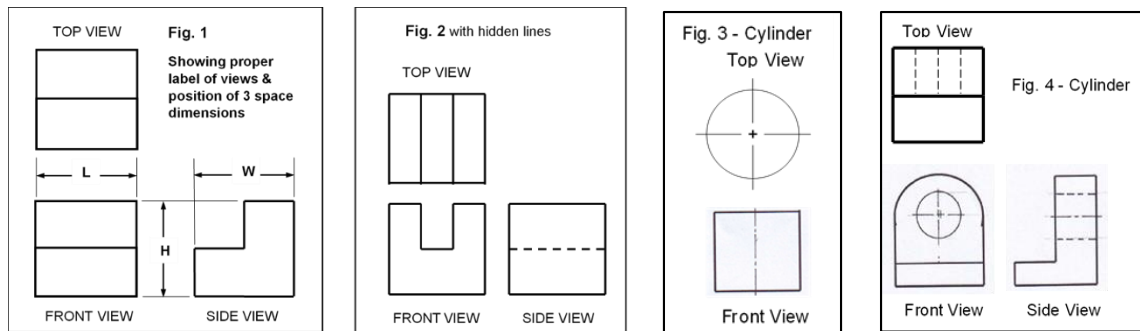


UNFOLDING THE GLASS BOX IN ONE PLANE SHOW

THE SIX PRINCIPAL VIEWS OF AN OBJECT

The object is to be presented in two or more separate views showing the three-space dimension, the width (**W**), height (**H**) or thickness (**T**) and length (**L**). See Figure 1 for the proper position of dimensions. This drawing will be the source of information on the true shape of the object on its top, front and side view of the objects.

In this projection the position of the three main views will be in L shape. The top and front view is vertically aligned together while the front view and right-side view are horizontally aligned. It is a general practice that RIGHT-SIDE VIEW is written as SIDE VIEW.

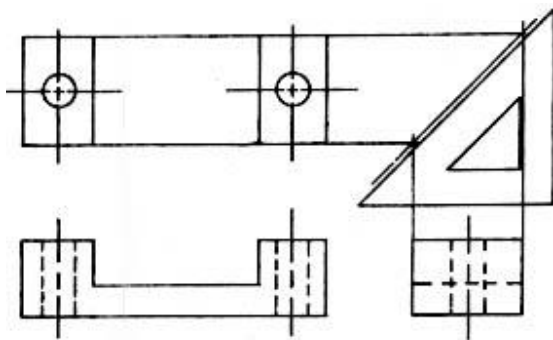


**Note: In orthographic drawing, it is not necessary to draw the three (3) common views in some instances, like in figure 3, since the shape of the right-side view (RSV) is the same as the front view, (i.e. two-view orthographic drawing).*

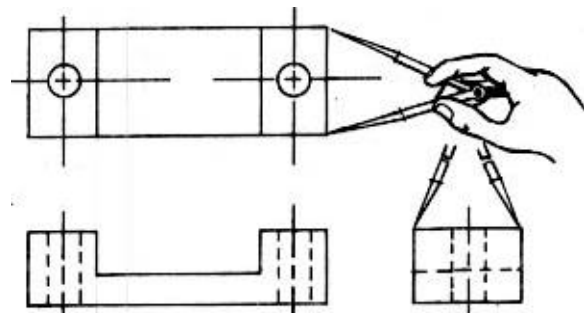
COMMON METHODS OF TRANSFERRING DEPTH DIMENSIONS

(Note: Projection lines are used to transfer height and width dimensions to other views, but depth dimensions require other methods.)

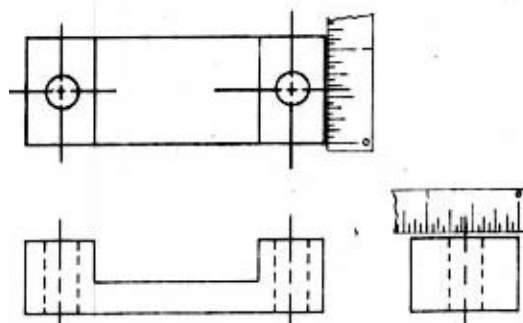
A. 45° TRIANGLES



B. DIVIDERS



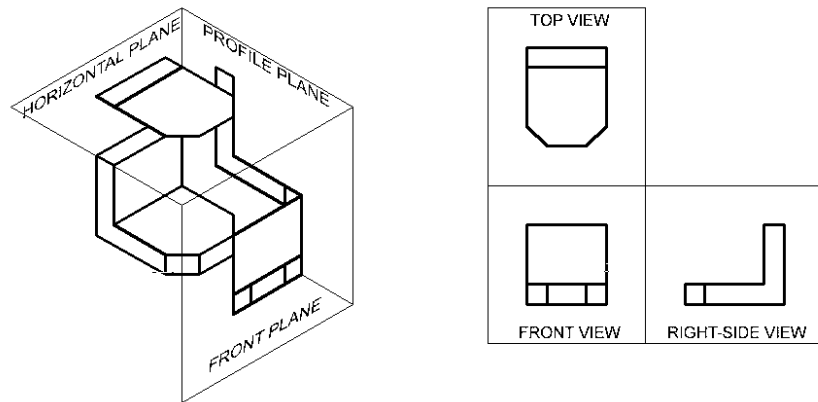
C. SCALE



Of the 3 methods, the first is the most commonly used especially if the draftsman has acquired skills in manipulating the triangles. Otherwise, the other methods are also good alternatives.

FIRST AND THIRD ANGLE PROJECTION.

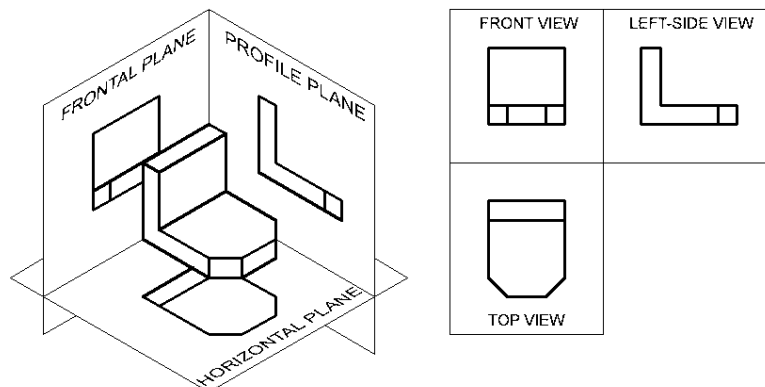
In orthographic projection, drawings are referred to as “*first-angle*” or “*third-angle*” projections.



VIEWS ARE PROJECTED FORWARD IN THIRD-ANGLE PROJECTION

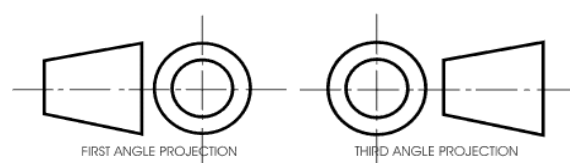
Third-angle projection is commonly used in the United States, Canada and Asia. Most European countries use first-angle projection. The difference between the two is how the object is projected and the position of the views on the drawing.

In ***third-angle projection***, the projection plane is considered to be between the viewer and the object, and the views are projected forward to that plane. The top view appears above the front view, the right-side view is to the right of the front view, the left view to the left of the front view, and so on.



VIEWS ARE PROJECTED BACKWARD IN FIRST-ANGLE PROJECTION

In ***first-angle projection***, the projection plane is on the far side of the object. The views of the object are projected to the rear and onto the projection plane instead of being projected forward. The individual views are the same as those obtained in the third-angle projection.

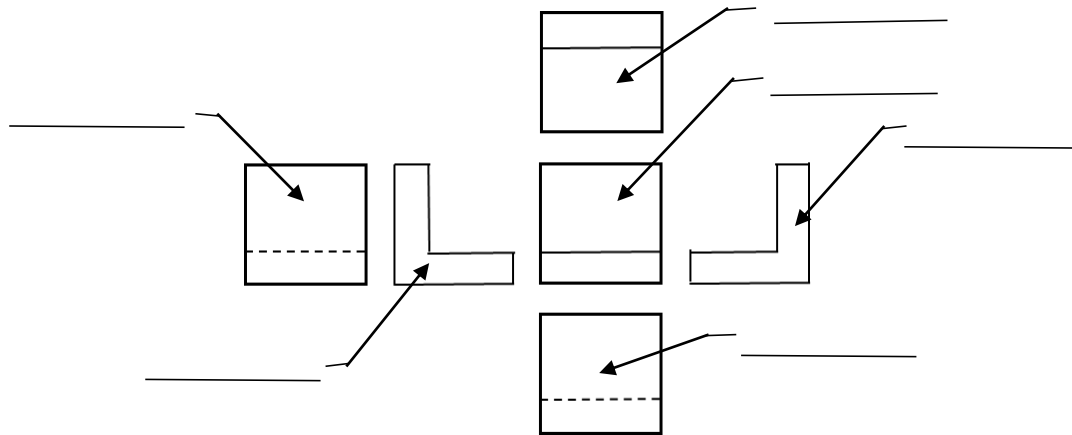


SYMBOL FOR FIRST-ANGLE AND THIRD-ANGLE PROJECTION



ACTIVITIES

Activity 1: Label the six principal views using Top View, Front View, Rear View, Right-side View, Left-side View, and Bottom View. Write the answer on the blank provided for each view.



Activity 2 - Blueprint Reading

Directions: Encircle the letter of the correct answer.

- Which of these views are often used in orthographic drawings?
 - top, front, rear views
 - top, front, right-side views
 - left-side, front, bottom views
 - left-side, front, right-side views
- What are the three space dimensions?
 - height, width, thickness
 - length, height, width
 - length, length, height
 - light, length width
- What two principal dimensions are shown in the right-side view?
 - height, length
 - height, thickness
 - eight, width
 - length, width
- What principal dimensions are represented in the top view?
 - height, length
 - height, width
 - length, height
 - length, width
- What principal dimensions are represented in the front view?
 - height, length
 - height, width
 - length, height/thickness
 - length, width
- What views are directly above the bottom view?
 - top view
 - right-side view
 - rear view
 - front view
- What principal dimension CANNOT be found in the top view?
 - width
 - thickness
 - light
 - length
- What principal dimension cannot be found in the right-side view?
 - width
 - thickness
 - light
 - length
- What view is located at the left side of the left side view?
 - top view
 - right-side view
 - rear view
 - front view

10. What view has its name always placed on its top?

- A. top view
B. right-side view
C. rear view
D. front view



REMEMBER

An orthographic projection is a representation of separate views of an object on a two-dimensional surface. It reveals the *width*, *length* (depth) and *height* or *thickness* of an object. In orthographic projection, you don't need to draw the 6 principal views. Sometimes 2-3 views (top, front and side view) are enough to represent orthographic views. Orthographic projection is classified as first-angle and third-angle projection. Of the two, third angle projection is commonly used in Asian countries, especially in the Philippines.

The three methods of transferring measurements are: 1) using triangles; 2) using compass; and 3) using scale. Of the three (3) methods, using triangles (45° x 45° x 90°) is the most commonly used especially if the one possessed skills in manipulating that instrument, otherwise the other two (2) methods are also good options.

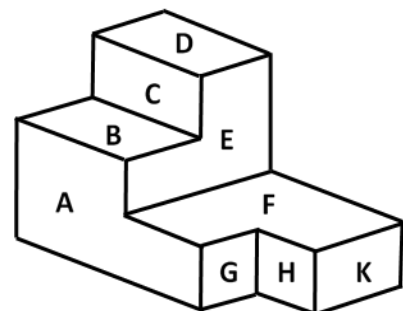
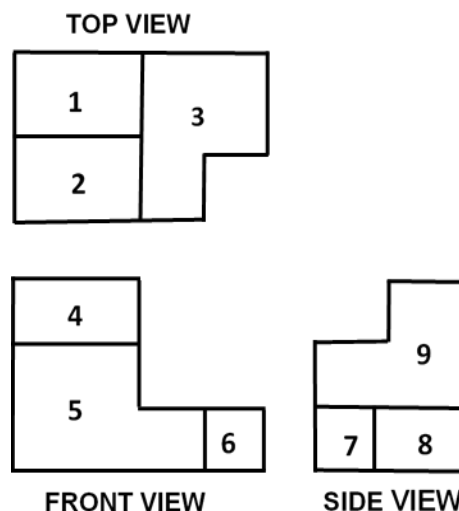


CHECK YOUR UNDERSTANDING

BLUEPRINT READING 1

Directions: Study the two (2) drawings and match the corresponding numbers from orthographic to the surfaces represented by capital letters in pictorial drawings. Write the letter of your answer on the space provided for each number.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____





POST TEST

Multiple Choice: Encircle the letter of the correct answer.

1. Which of the following statement is correct?
 - A. Orthographic drawings show more detail than 3-D drawings.
 - B. Orthographic drawings can only be done by computer software.
 - C. Orthographic drawings are not drawn in proportion to the object.
 - D. Orthographic drawings are less detail than 3-D because they are in 2-D.
2. The projection shown in the frontal plane is called front view or front elevation.
 - A. diagonal plane
 - B. horizontal plane
 - C. profile plane
 - D. vertical plane
3. Which style shows images projected on the *opposite* side of the observer?
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
4. _____ projection is more popular in America and Asian countries.
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
5. The projection plane on this angle is considered to be between the viewer and the object, and the views are projected forward to that plane.
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
6. In this projection, the top view appears above the front view, the right-side view is to the right of the front view, the left view to the left of the front view, and so on.
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
7. The projection plane on this angle is on the far side of the object.
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
8. The views of the object are projected to the rear and onto the projection plane instead of being projected forward.
 - A. first-angle
 - B. second-angle
 - C. third-angle
 - D. fourth-angle
9. The following are common methods of transferring depth dimensions except one, which does not.
 - A. using $30^\circ \times 60^\circ \times 90^\circ$
 - B. using $45^\circ \times 45^\circ \times 90^\circ$
 - C. using divider
 - D. using scale
10. The top view is _____ aligned with the front view.
 - A. diagonally
 - B. horizontally
 - C. vertically
 - D. horizontally & vertically
11. This is the view that shows the most about the object.
 - A. side view
 - B. plain view
 - C. front view
 - D. end view
12. It is the view looking from above.
 - A. end view
 - B. front view
 - C. side view
 - D. top view
13. An orthographic drawing shows _____ representations of an object.
 - A. one-dimensional
 - B. two-dimensional
 - C. three-dimensional
 - D. four-dimensional

14. A projection at this plane is called the side view or end view, or side or end elevation.

- | | |
|---------------------|-------------------|
| A. frontal plane | C. profile plane |
| B. horizontal plane | D. vertical plane |

15. The projection shown in this plane is called top view or plan view.

- | | |
|------------------|---------------------|
| A. bottom plane | C. horizontal plane |
| B. frontal plane | D. profile plane |

References:

- Giesecke, Mitchell and Spencer. *Technical Drawing*; The Macmillan Company: 1999.
- French and Vierck. *Engineering Drawing* 10th edition MacGraw, Hill Book Company, 1960
- German M. Manaois. *Drafting 1 and 2* Phoenix Publishing:1983
- Norman Stirling. *Introduction to Technical Drawing* Delmar Publishing: 1977
- Competency Based Learning Material, *Technical Drafting*
- Madsen, Shumaker, Turpin, Stark: *Engineering, Drawing and Design*
- Downloaded (Internet) [Pinterest](#)

<p>Post-test</p> <p>1. A 2. C 3. A 4. C 5. C 6. C 7. A 8. A 9. A 10. C 11. B 12. A 13. B 14. C 15. C</p>	<p>Activity 2</p> <p>1. Top, front, RSV 2. Length, Width, Height/Thickness 3. Width & Height/Thickness 4. Length & Width 5. Length & Height/Thickness 6. Front view 7. Height/Thickness 8. Length 9. Rear view 10. Top view</p> <p>Check Your Understanding</p> <p>1. D 2. B 3. F 4. C 5. A 6. H 7. G 8. K 9. E</p> <p>Blueprint Reading</p>	<p>Key to Correction</p> <p>1. D 2. C 3. C 4. B 5. B 6. C 7. C 8. D 9. First angle 10. Third angle</p> <p>Looking Back</p> <p>1. Phantomline 2. Center line 3. Dimension line 4. Extension line 5. Leader line 6. Section line or visible line 7. Short-break line (conventional) 8. Cutting plane line 9. Hidden/invisible line 10. Object line</p>
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