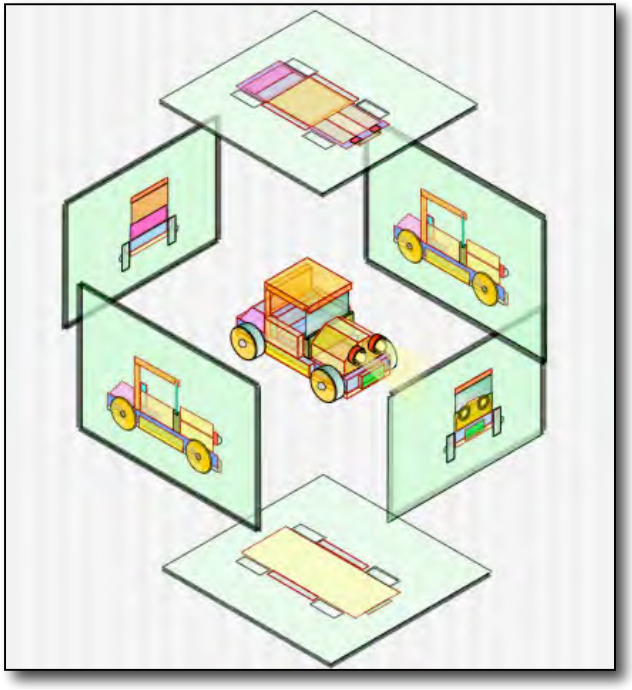
centre de développement pédagogique
pour la formation générale en science et technologie

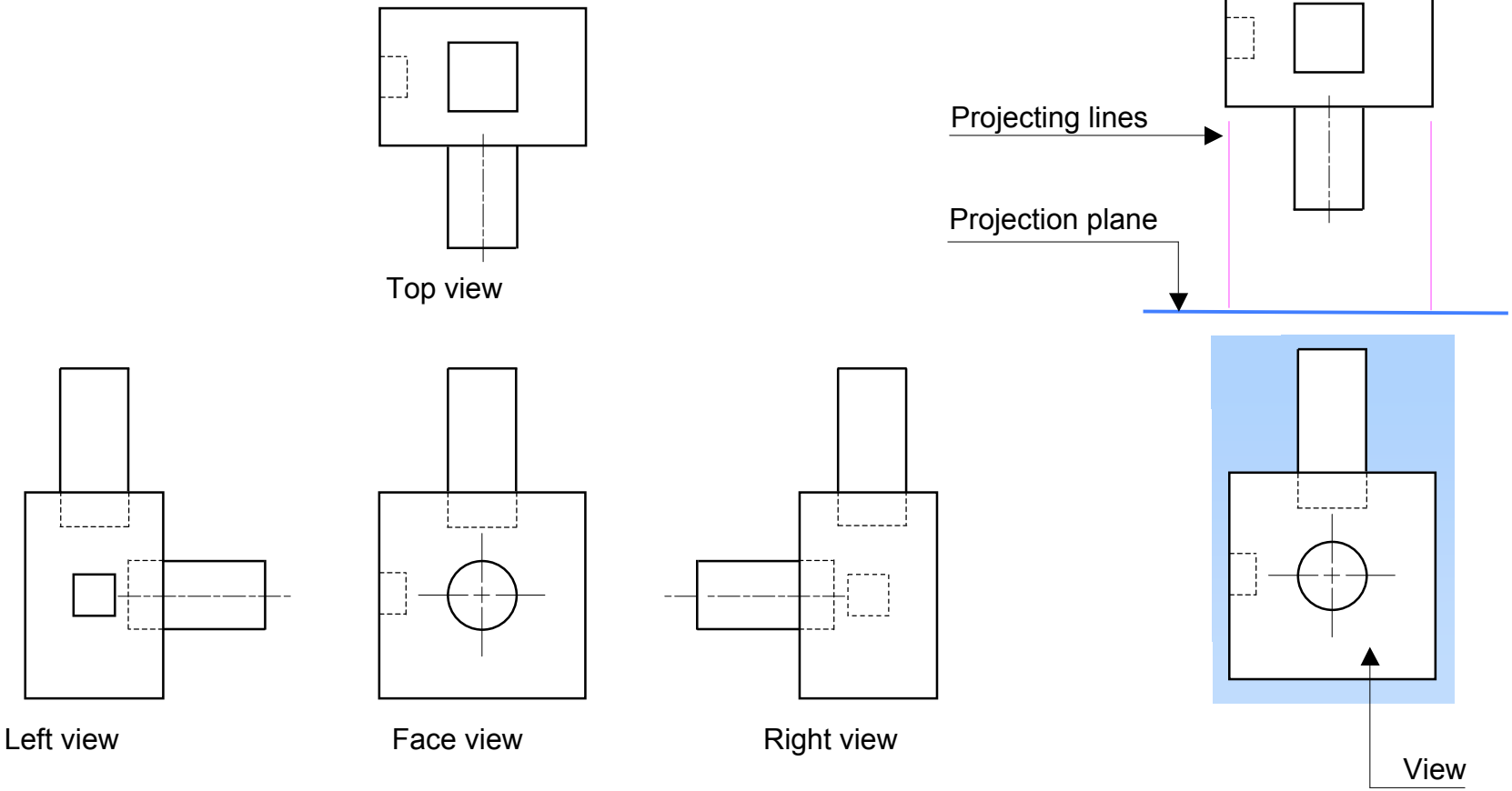
Short review of types of projections



May 2011

WORKING DOCUMENT

Multi view orthogonal projections



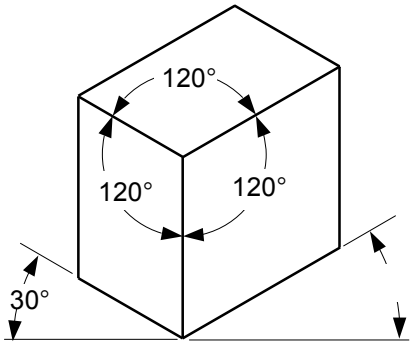
Multi view orthogonal projections

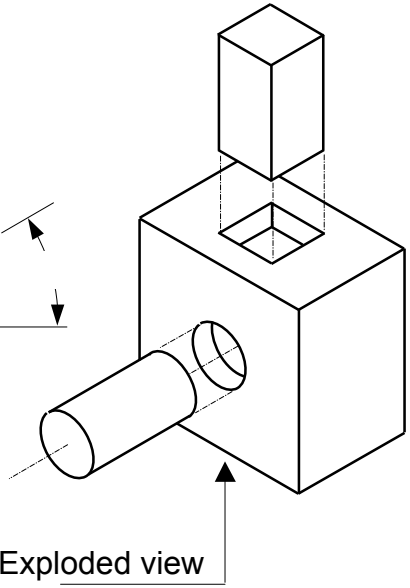
Characteristics:

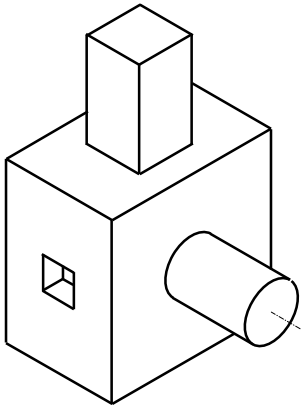
- There are 6 possible views to represent an object.
- Each view represents only 2 dimensions of the object.
- Draw the number of views required to completely describe the object.
- The choice of the principal, or face view, determines the designation of the other views.

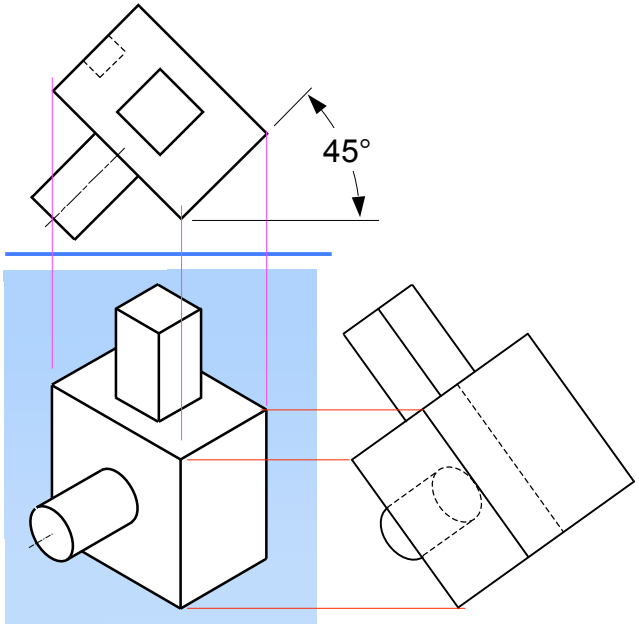
Axonometric projections

Isometric projection









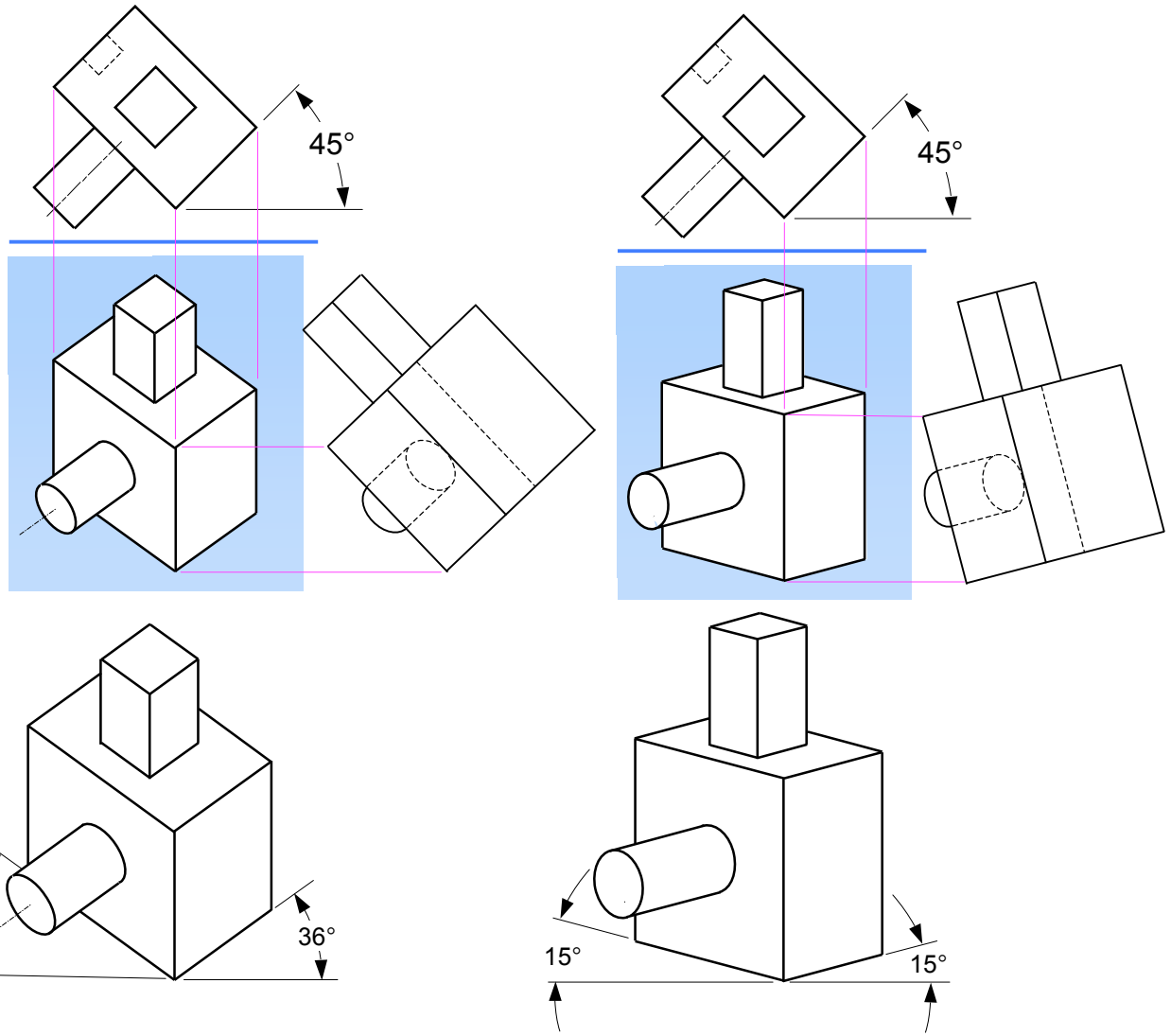
<u>Isometric projection</u>

Characteristics:

- <u>It is an orthogonal projection</u> that shows the 3 dimensions of the object.
- The observer faces the object.
- The object pivots 45° around the principle axis.
- The object is inclined towards the front in order to obtain 3 equal angles with the projection plane.
- In this position, the edges of the cube form 120° angles and the vanishing lines, 30° angles.
- Because the object is inclined to obtain 3 equal angles, the length of the isometric lines (vertical and vanishing) is proportionally reduced. We usually draw them, however, without taking this reduction into account.
- In this type of projection, a circle becomes an ellipse.

Axonometric projections

Dimetric projection



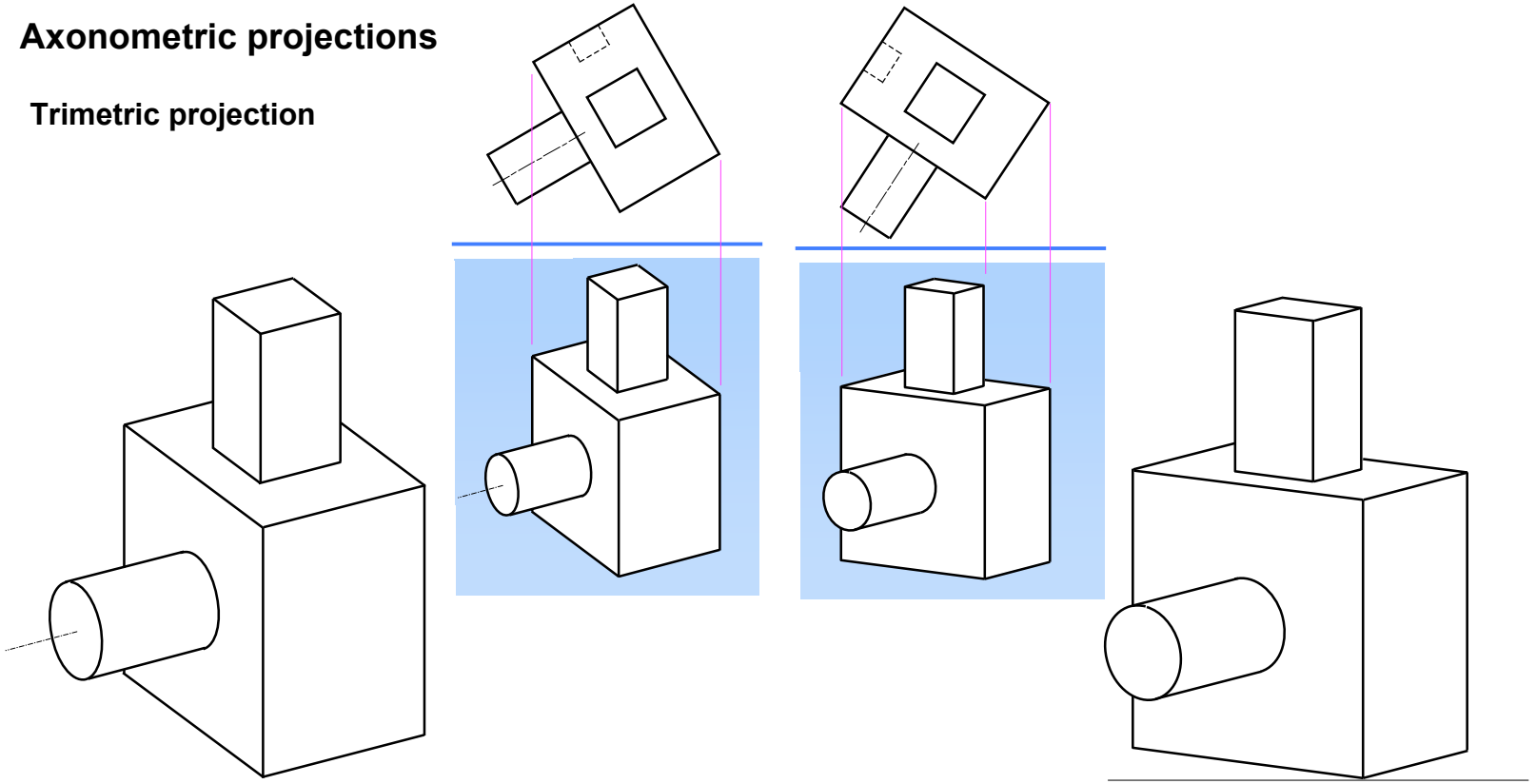
Dimetric projection

Characteristics:

- It is an orthogonal projection that shows the 3 dimensions of the object.
- The observer faces the object.
- The object pivots 45° around the principle axis.
- The object is inclined towards the front in order to obtain 2 equal angles with the projection plane.
- The angle of the vanishing lines varies between 10° and 45° except 30°.
- The greater the inclination of the object, the greater the angle of the vanishing lines.
- In this type of projection, a circle becomes an ellipse.

Axonometric projections

Trimetric projection



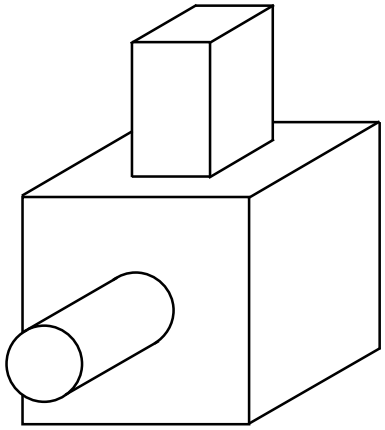
The sum of the 2 angles is less than 90°

Trimetric projection

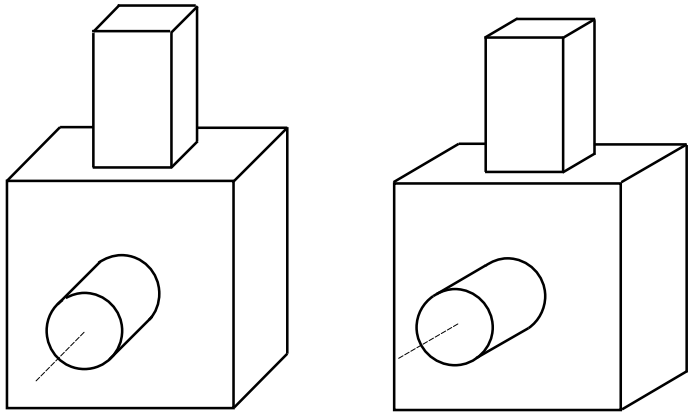
Characteristics:

- It is an orthogonal projection that shows the 3 dimensions of the object.
- The observer faces the object.
- The object is placed in such a way as to present 3 different angles with the projection plane.
- In this type of projection, a circle becomes a different ellipse for each position.

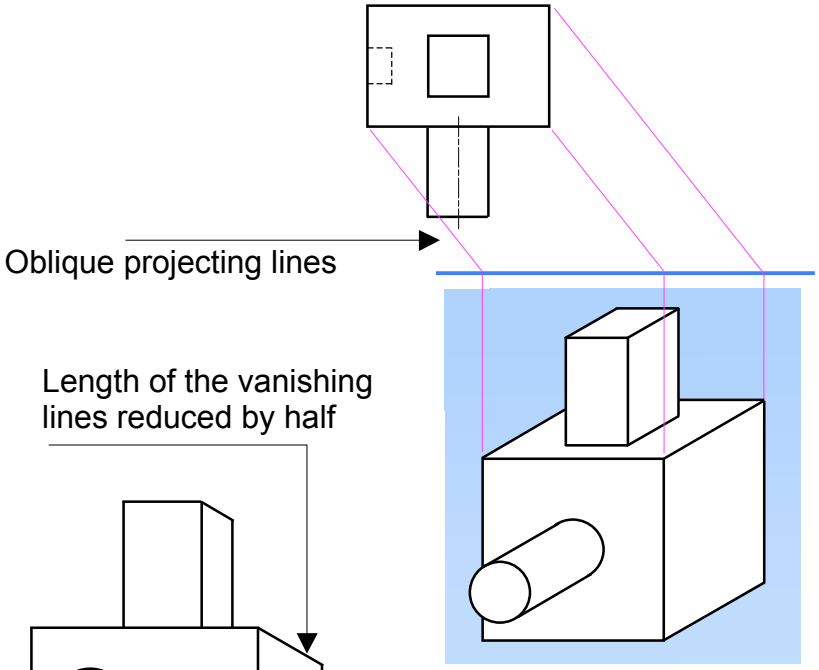
Oblique projections (cabinet and cavalier)



Cavalier projection



Cabinet projection



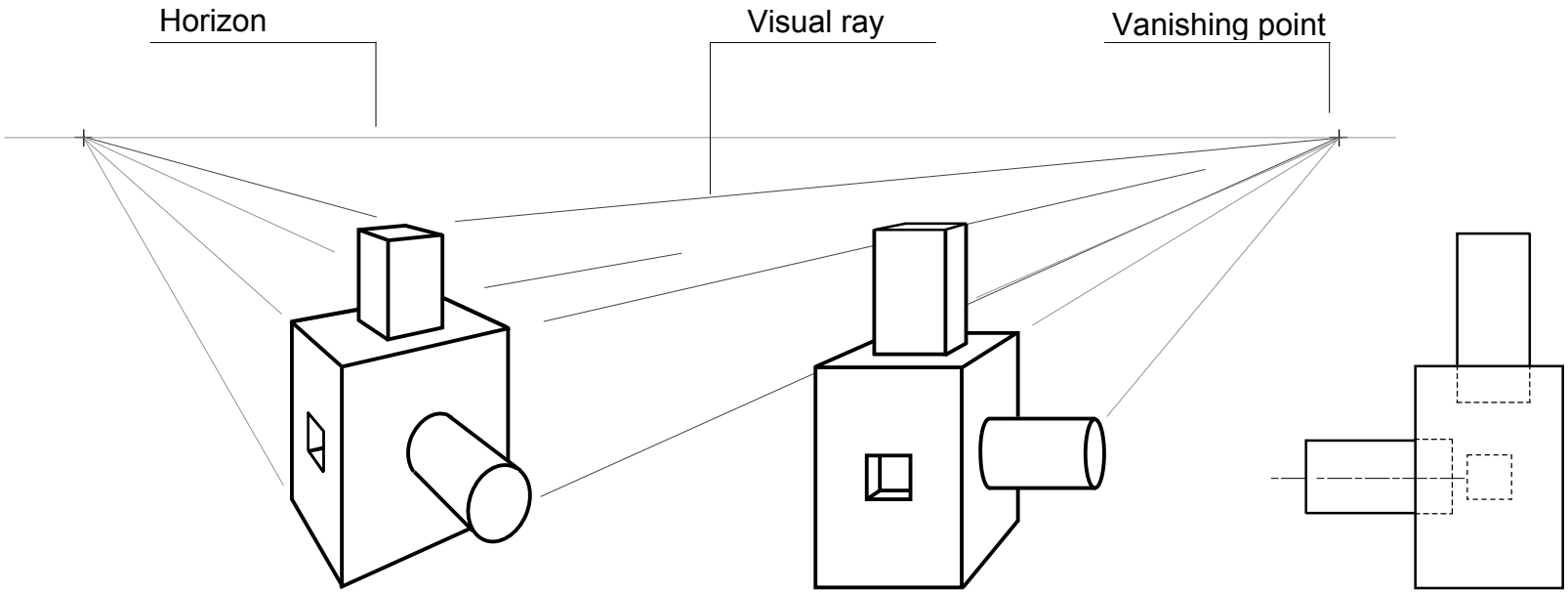
Oblique projections (cabinet and cavalier)

Characteristics:

- The 3 dimensions of the objet are shown.
- The projecting lines are oblique and the observer does not face the object.
- The front part of the view is the same as we would have obtained with a multi view orthogonal projection.
- Circles retain their appearance on the frontal view.
- The choice of the angles for the vanishing lines is arbitrary, but it is usually 45° or 30°.
- The cabinet projections retains these characteristics, but the vanishing lines are foreshortened to reduce the obvious distortion.

Conical projections

Perspectives with 1 or 2 vanishing points



Perspectives with 1 or 2 vanishing points

Characteristics:

- The 3 dimensions of the objet are shown.
- The observer is close enough to the object that the visual rays converge to a vanishing point.
- It is the type of projection that gives an image that is the closest to reality.