ENGINEERING GRAPHICS

Topic:
Projections of lines

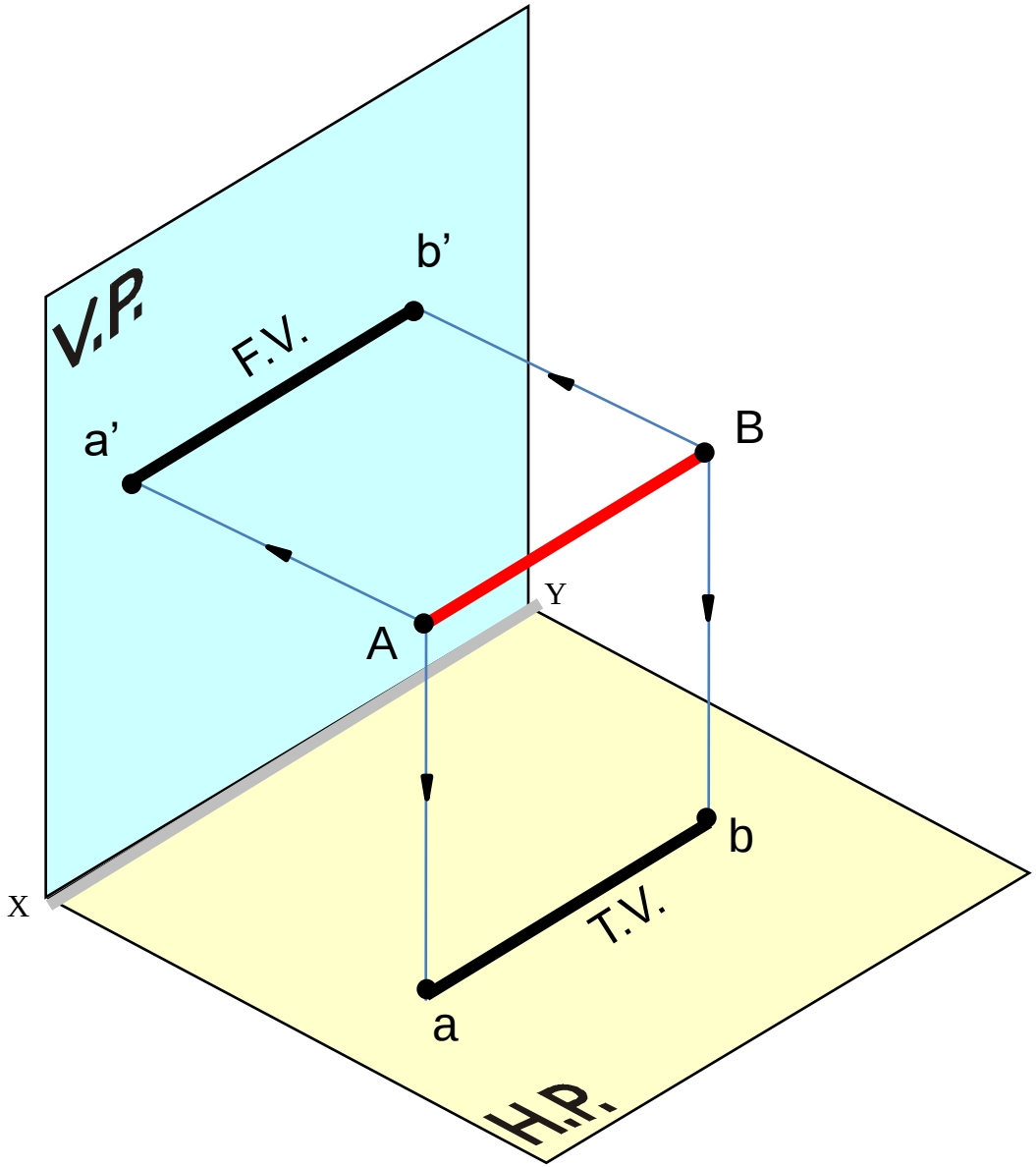
https://www.youtube.com/watch?v=7GfmZHMBMsc

https://www.youtube.com/watch?v=l3B8qeXB7F0

Projections of Lines

LINE

A straight line is the shortest distance between two points.


V.P.
F.V.
b'
a'
B
A
Y
X
b
T.V.
a
H.P.

Projections of Lines

Projections of the ends of any line can be drawn using the principles developed for projections of points.

Top views of the two end points of a line, when joined, give the top view of the line.

Front views of the two end points of the line, when joined, give the front view of the line.

Both these projections are straight lines.

Position of a straight line in space

A line in space may be parallel, perpendicular or inclined to either the HP or the VP or both of them.

Line parallel to reference plane

- **When a line is parallel to one of the reference planes, its projection on the reference plane to which it is parallel is <u>a line of True Length</u>.**

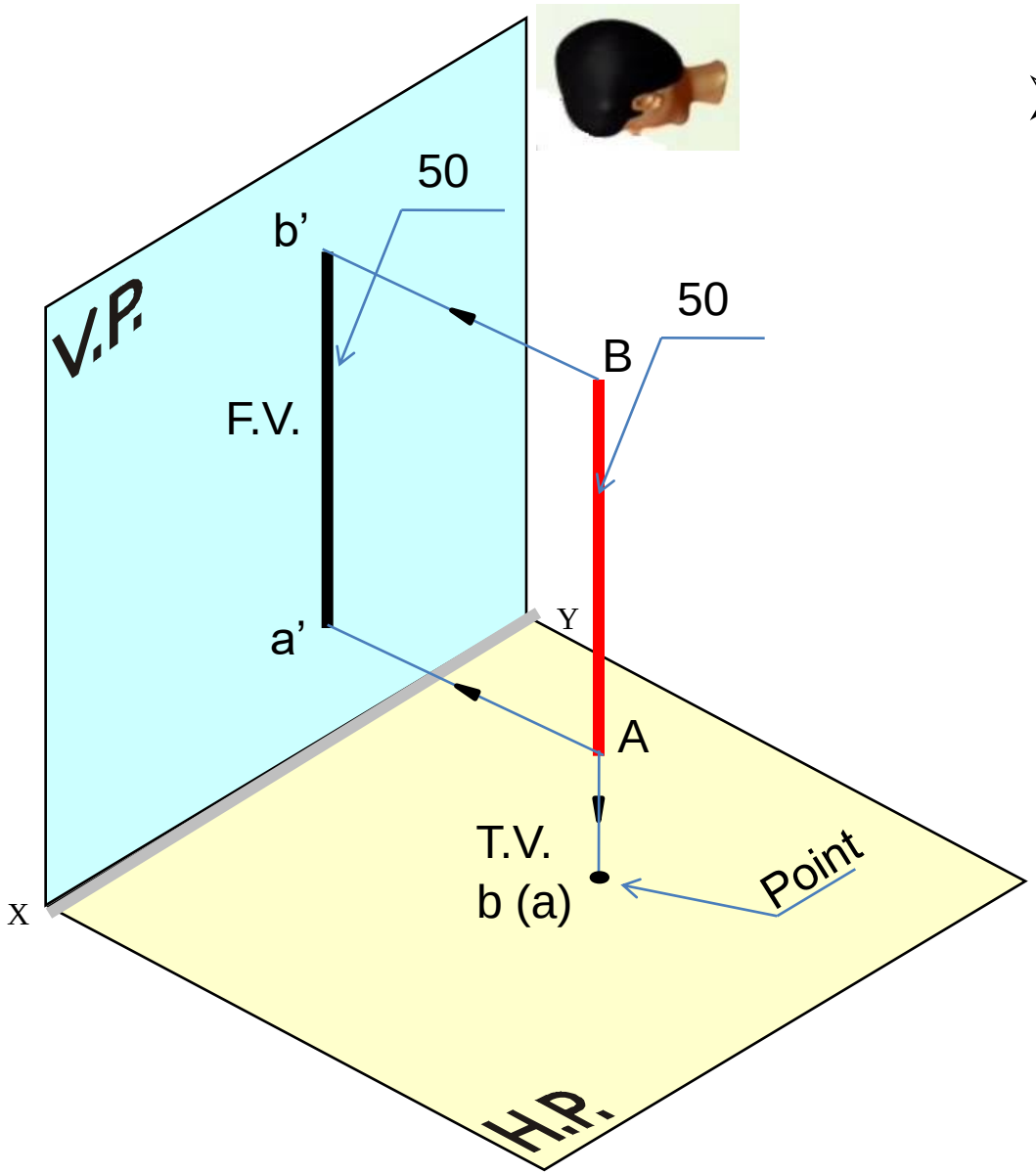
<u>Observer</u>

Line inclined to reference plane

- **When a line is inclined to one of the reference planes, its projection on the reference plane to which it is inclined is a <u>line of Reduced Length</u>.**

<u>Observer</u>

Line perpendicular to reference plane



- **When a line is perpendicular to one of the reference planes, its projection on the reference plane to which it is perpendicular is a <u>POINT</u>.**

<u>Observer</u>

Traces of Line

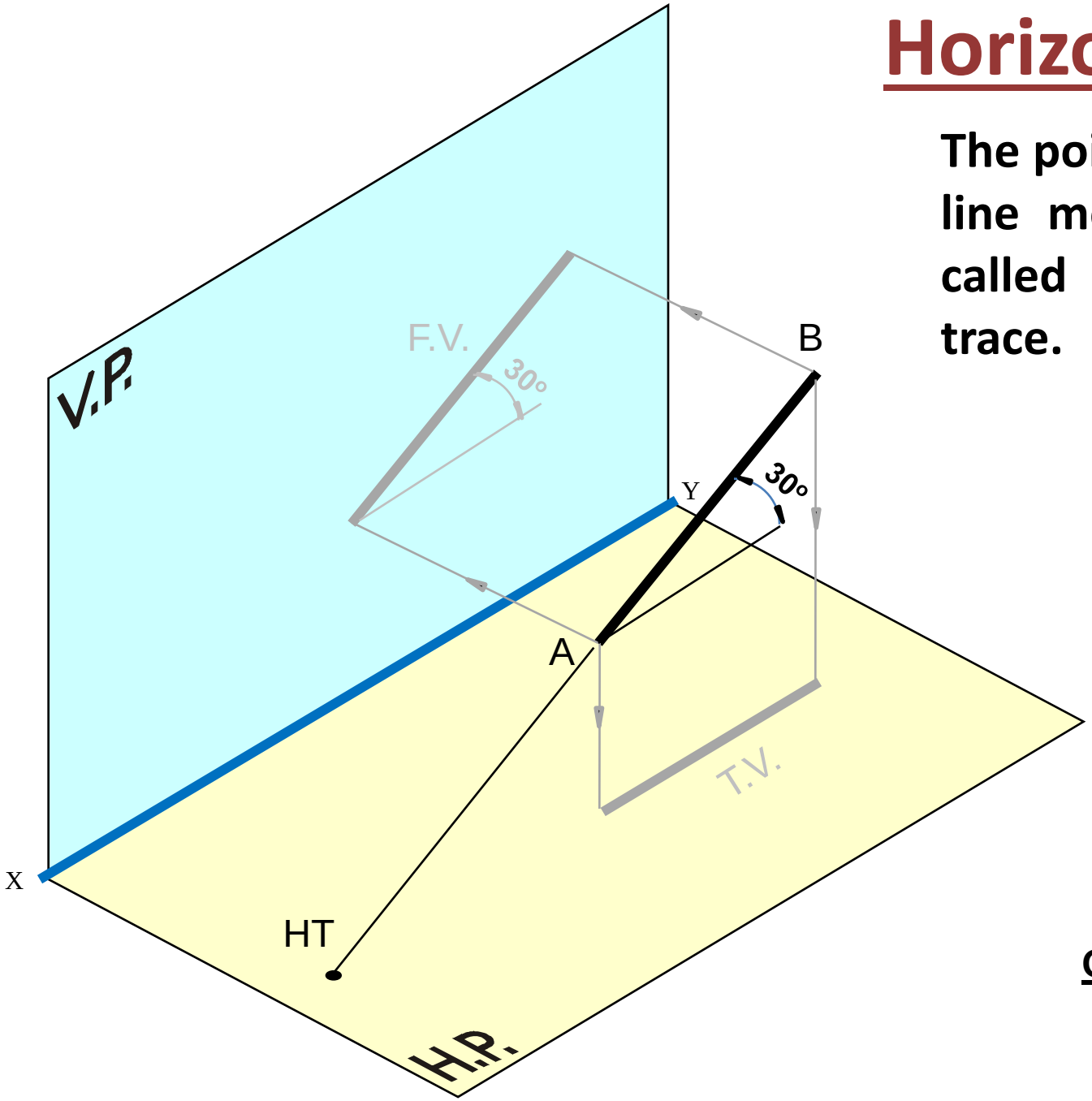
The point of intersection of a given line, produced if necessary, with the reference planes are called its traces.

There can be two traces for a line in space.

1. **Horizontal Trace**
2. **Vertical Trace**

Horizontal Trace

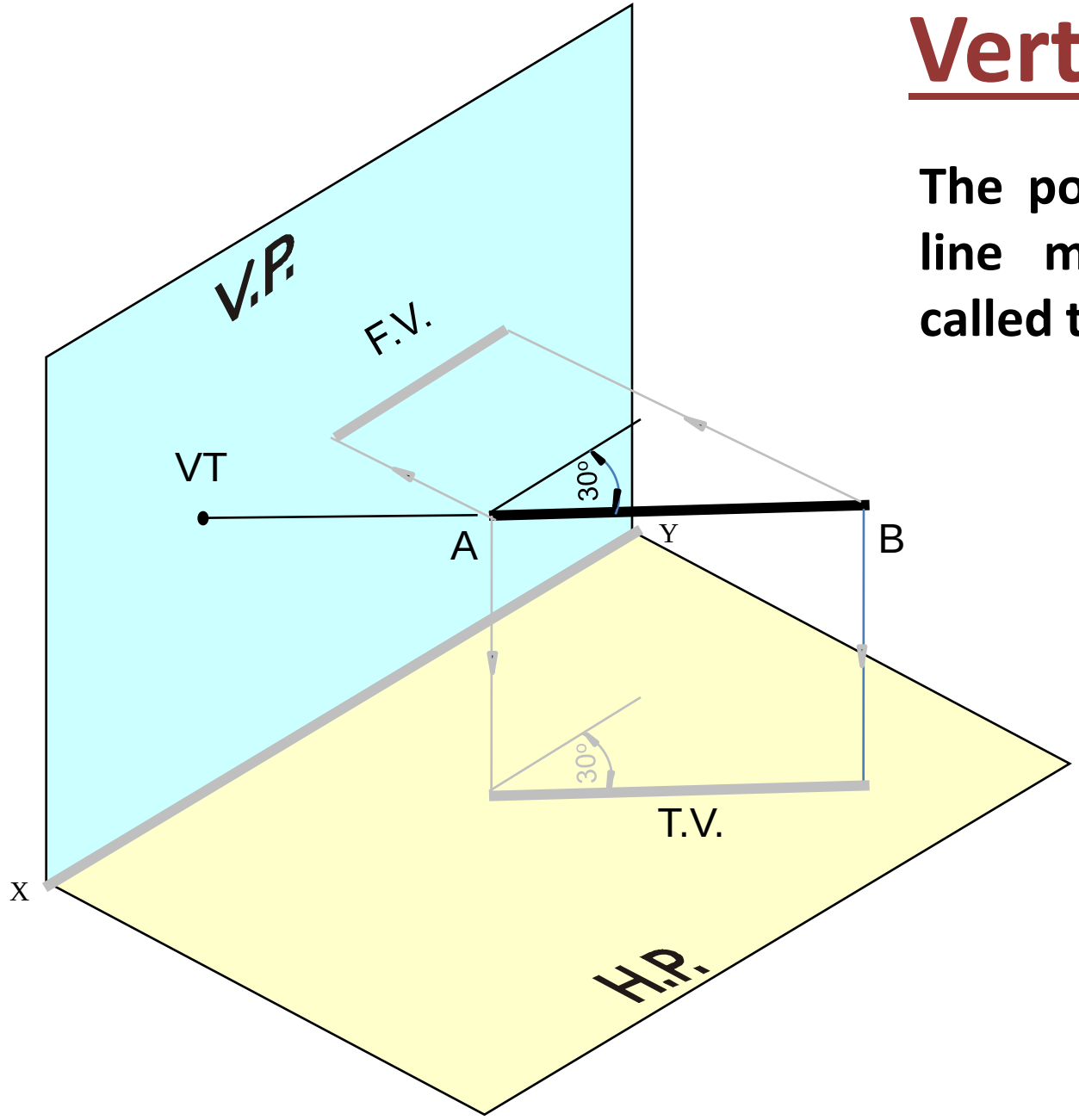
The point at which the line meets the HP is called the horizontal trace.



Observer

Vertical Trace

The point at which the line meets the VP is called the Vertical trace.



Observer

Simple cases of the line

Case 1: Line parallel to both HP and VP

Case 2: Line inclined to HP and parallel to VP

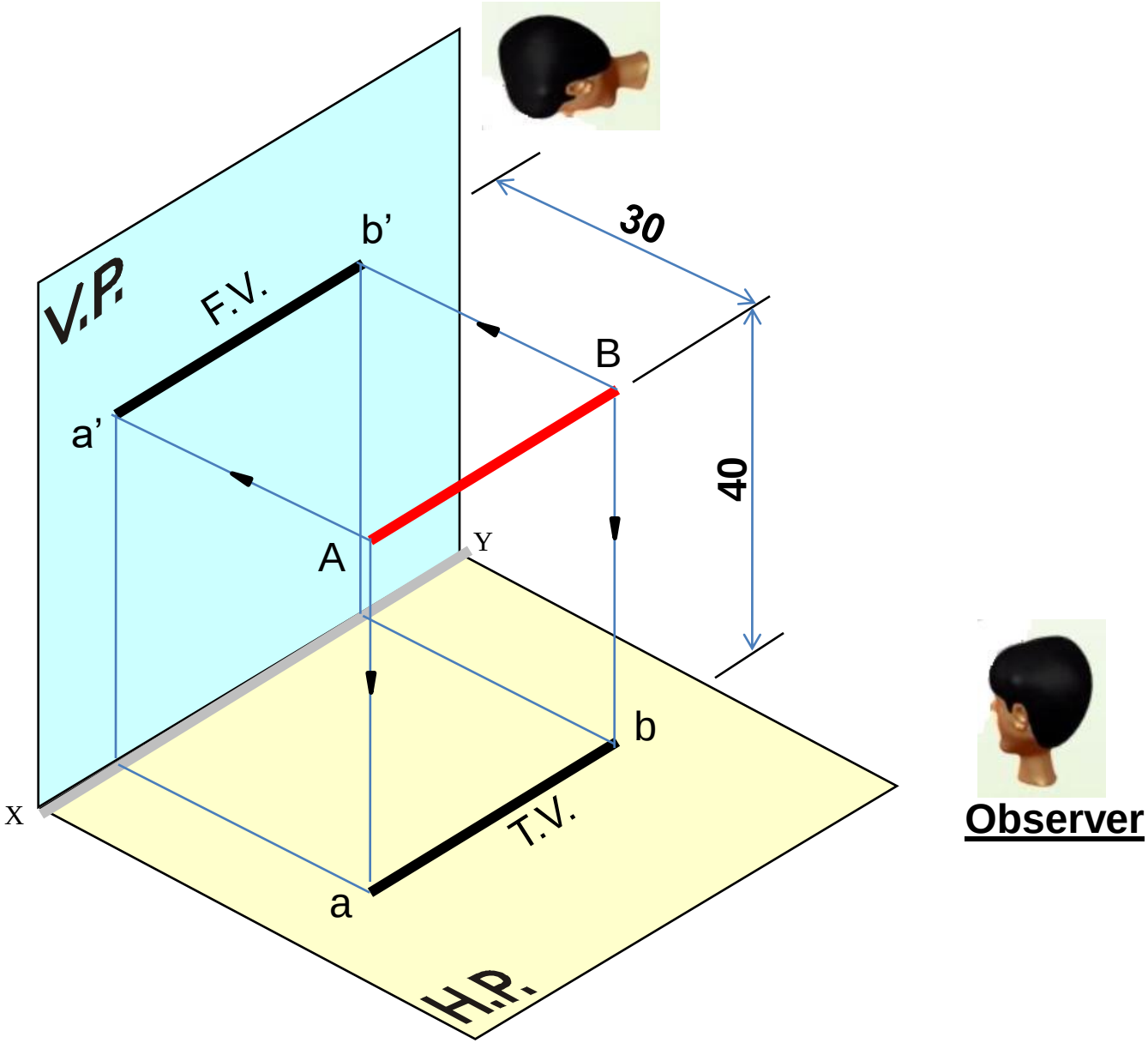
Case 3: Line inclined to VP and parallel to HP

Case 4: Line perpendicular to HP and parallel to VP

Case 5: Line perpendicular to VP and parallel to HP

Case 1:
Line Parallel to both HP and VP

Q1. A line AB is 50 mm long. Endpoints A & B are 40 mm above HP and 30 in front of VP. Draw projections.



Observer

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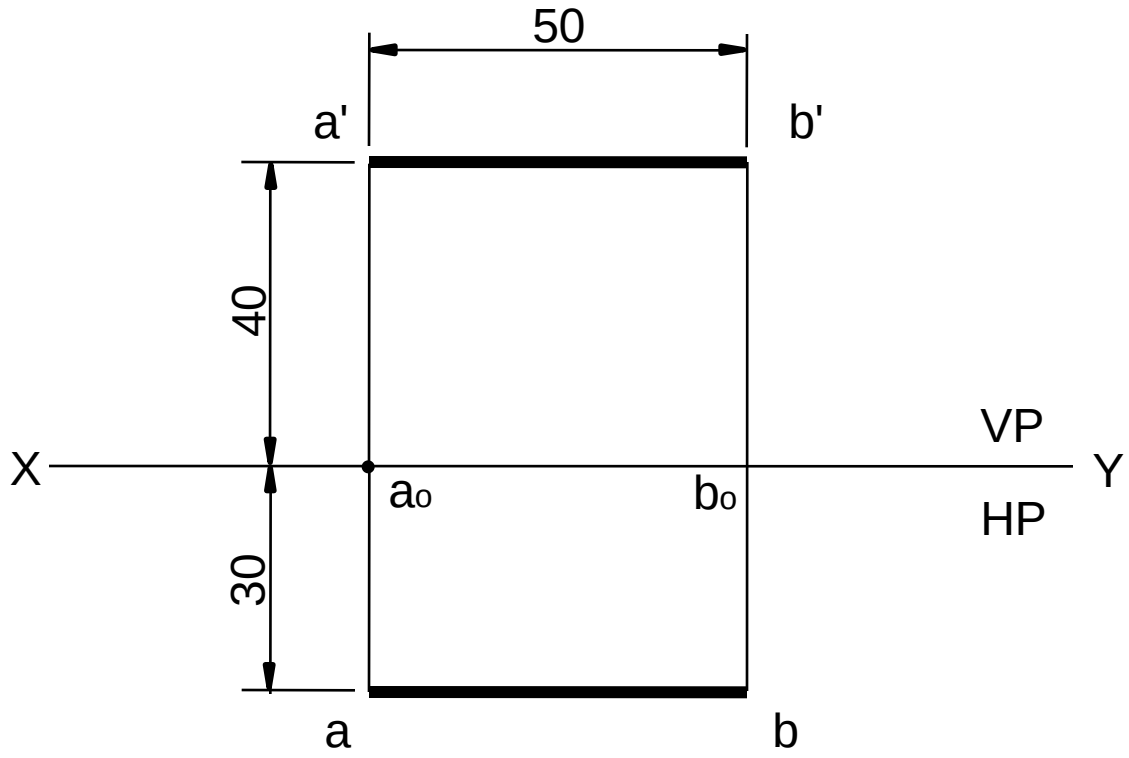

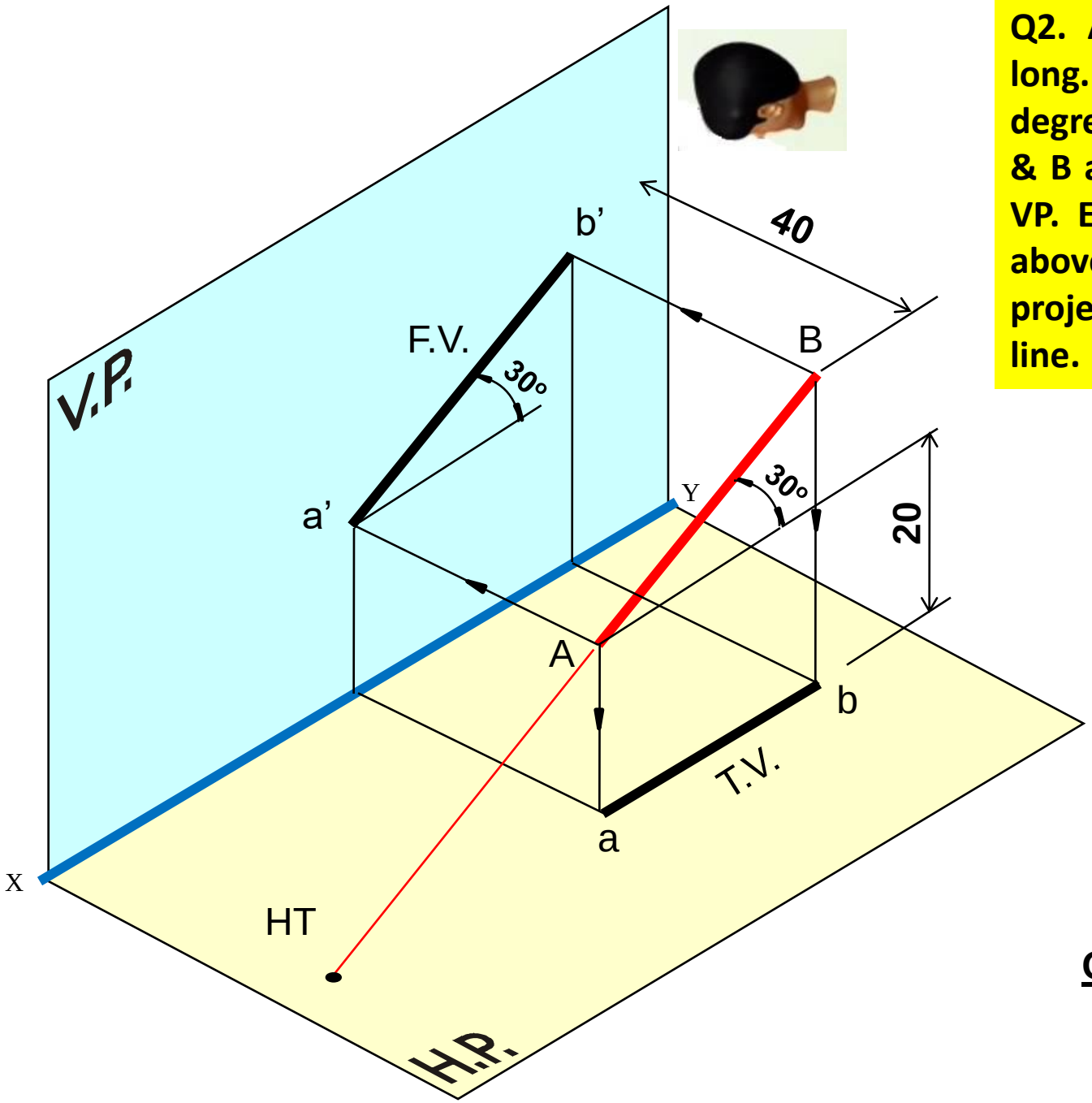

Q2. A line AB is 50 mm long. Line is inclined at 30 degree to HP. Endpoints A & B are 40 mm in front of VP. Endpoint A is 20 mm above HP. Draw projections and trace of line.

Observer

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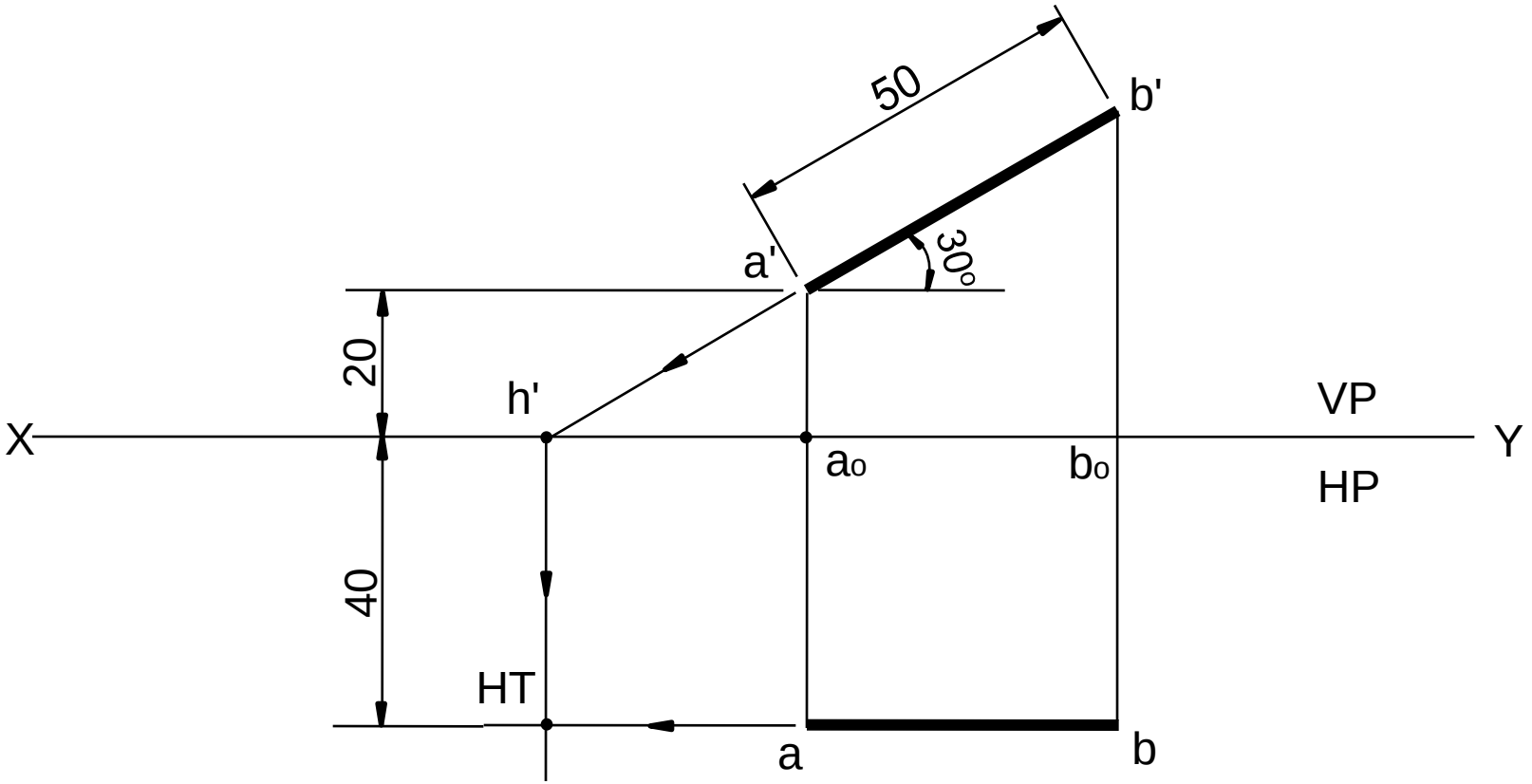

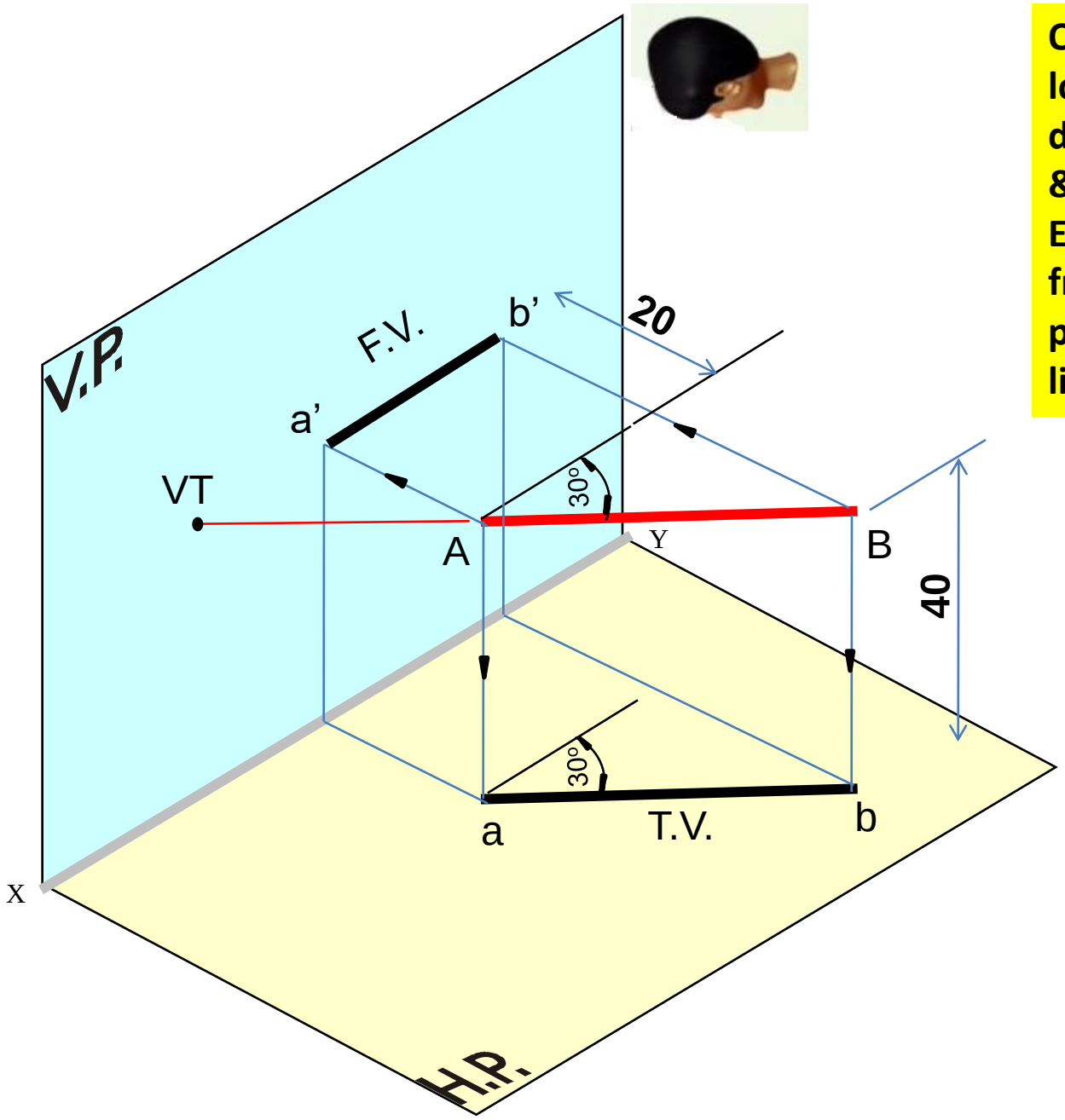

Q3. A line AB is 50 mm long. Line is inclined at 30 degree to VP. Endpoints A & B are 40 mm above HP. Endpoint A is 20 mm in front of VP. Draw projections and trace of line.

Observer

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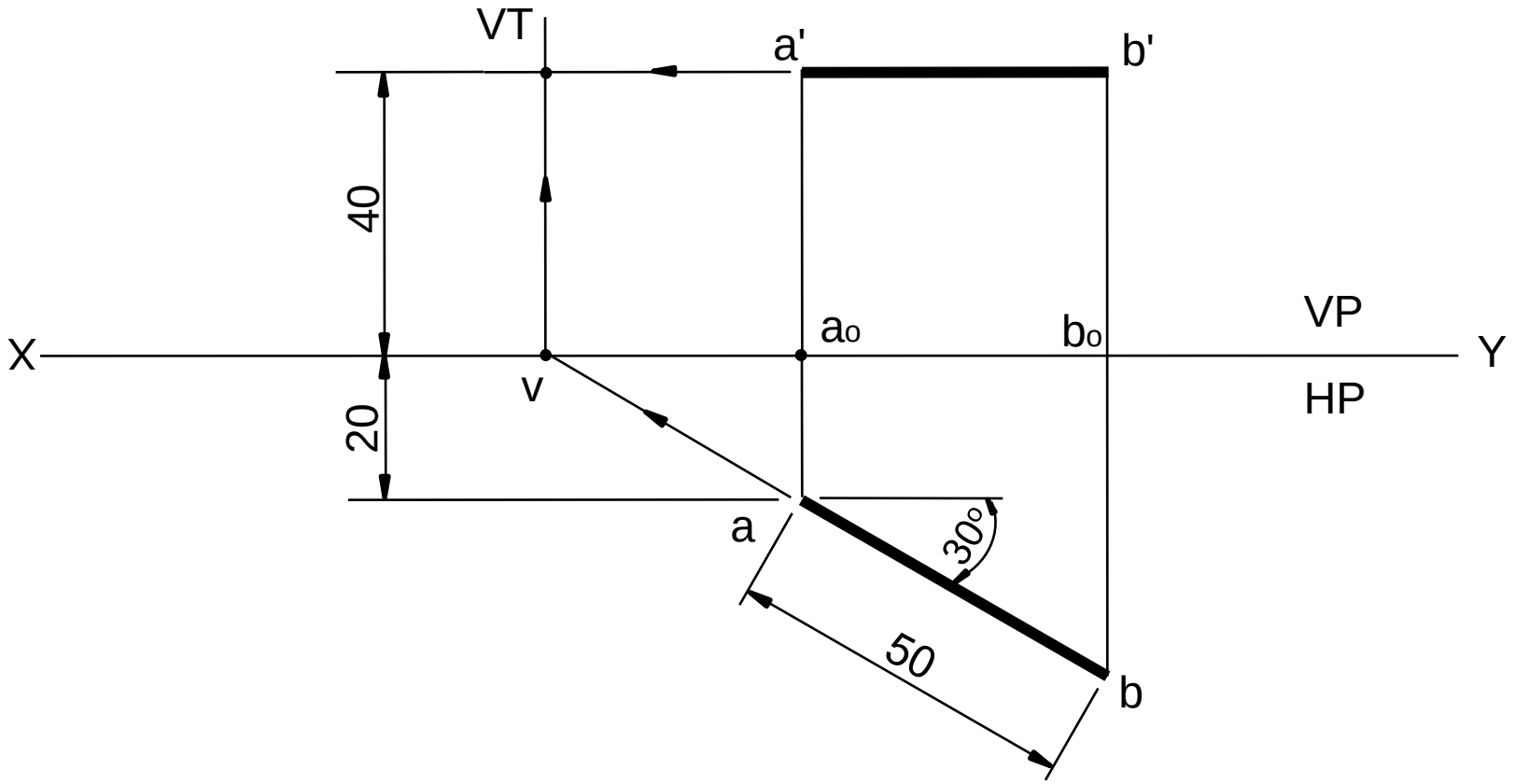
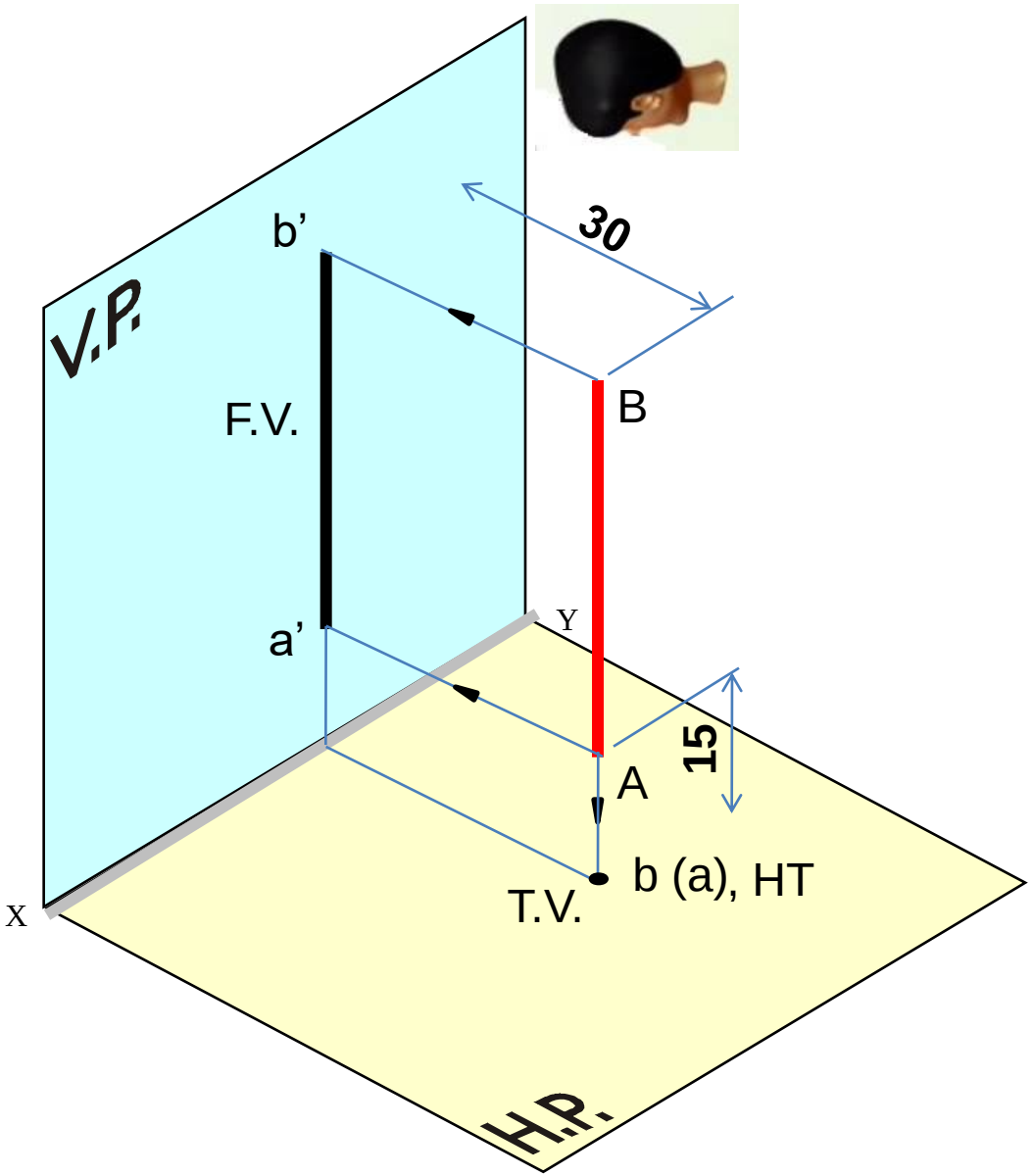
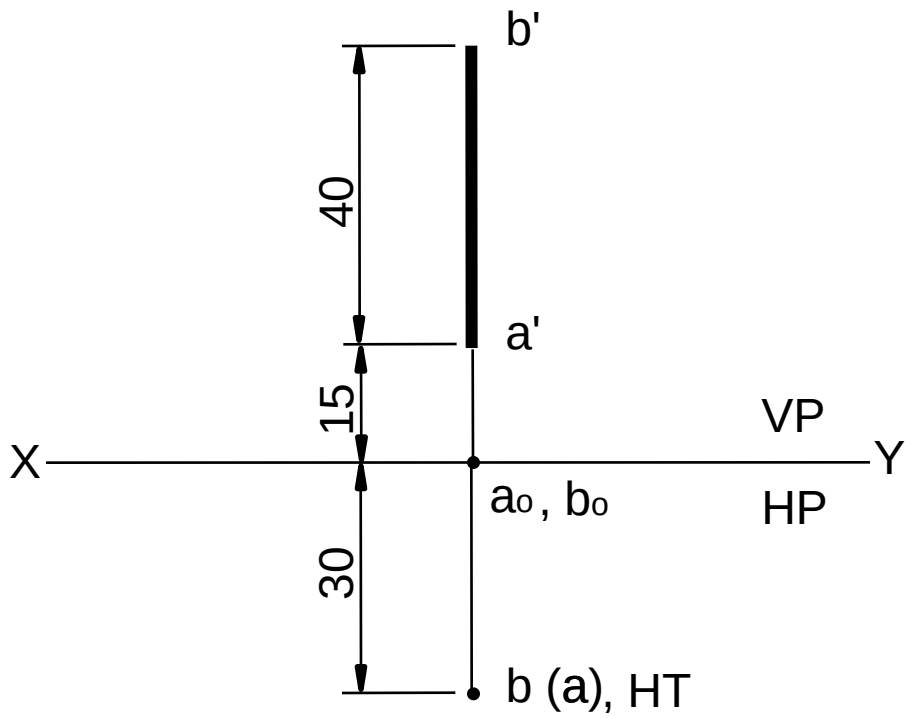


Q4. A line AB is 40 mm long. Line is perpendicular to HP. Endpoints A & B are 30 mm in front of VP. Endpoint A is 15 mm above HP. Draw projections and trace of line.



Observer

Q4. A line AB is 40 mm long. Line is perpendicular to HP. Endpoints A & B are 30 mm in front of VP. Endpoint A is 15 mm above HP. Draw projections and trace of line.



Q5. A line AB is 40 mm long. Line is perpendicular to VP. Endpoints A & B are 30 mm above HP. Endpoint A is 15 mm infront of VP. Draw projections and trace of line.

Observer

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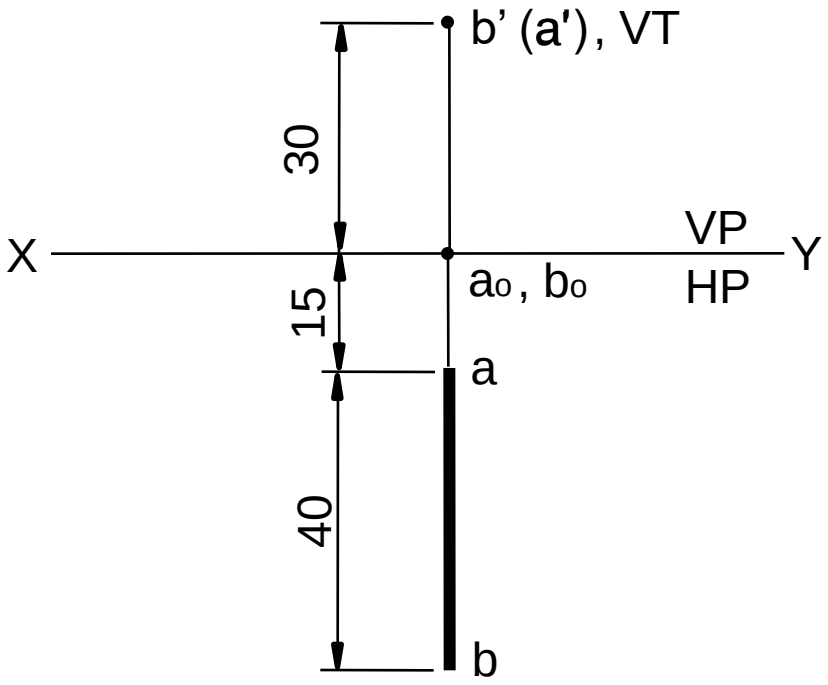

Thanks