Orthogonal axonometry

= orthogonal projection on one projection plane ρ – axonometric projection plane

- ρ has general position with respect to the Cartesian coordinate system (O, x, y, z)
- ρ is the principle projection plane, we have three auxiliary planes:

→ *The horizontal plane* – $\pi = (x,y)$
→ *The vertical (frontal) plane* – $\nu = (x,z)$
→ *The side plane* – $\mu = (y,z)$

- axonometry is given by axonometric axes x^o, y^o, z^o (later let us denote x, y, z only) or by axonometric triangle XYZ (vertices of the ax. triangle are points of intersection of coordinate axes *x, y, z* with the projection plane)
- axonometric triangle XYZ is acute – axonometric view of the origin is the orthocenter (intersection of altitudes) of the triangle XYZ
- axonometric views of coordinate axes x, y, z are altitudes of the triangle XYZ

The orthogonal projection of the point A

Any point *A* in the space is represented by a pair of axonometric views: usually axonometric view of the point *A* and axonometric view of its top view on the plane π = (x, y). (Instead of the axonometric view of the top view can be given the axonometric view of the front view or the side view and the other ones can be simply found.)

→ *The axonometric projection* of the point *A* – marked *A*
= the orthogonal projection of the point *A* into the projection plane ρ

→ *The axonometric horizontal projection* (*the first projection*) of the point *A* – marked A_1
= the orthogonal projection of the horizontal projection of the point *A* into the projection plane ρ

→ *The axonometric vertical projection* (*the second projection*) of the point *A* – marked A_2
= the orthogonal projection of the vertical projection of the point *A* into the projection plane ρ

→ *The axonometric side projection* (*the third projection*) of the point *A* – marked A_3
= the orthogonal projection of the side projection of the point *A* into the projection plane ρ

→ The straight line connecting *A*, A_1 is parallel to the axis z

The orthogonal projection of the line a

Any straight line *a* in the space is represented by a pair of axonometric views: usually axonometric view of the line *a* and axonometric view of its top view on the plane π = (x, y).

→ *The axonometric projection* of the line *a* – marked *a*
= the orthogonal projection of the line *a* into the projection plane ρ

→ *The axonometric horizontal projection* (*the first projection*) of the line *a* – marked a_1

= the orthogonal projection of the horizontal projection of the line *a* into the projection plane ρ

→ *The axonometric vertical projection* (*the second projection*) of the line *a* – marked a_2
= the orthogonal projection of the vertical projection of the line *a* into the projection plane ρ

→ *The axonometric side projection* (*the third projection*) of the line *a* – marked a_3
= the orthogonal projection of the side projection of the line *a* into the projection plane ρ

→ *A trace point* = the point of intersection of a line with the coordinate planes

→ *The horizontal trace point* – marked *P*
= the point of intersection of a line with the horizontal plane

→ *The vertical trace point* – marked *N*
= the point of intersection of a line with the vertical plane

→ *The side trace point* – marked *M*
= the point of intersection of a line with the side plane

The orthographic projection of the plane α

A trace line of the plane α = a line of intersection of the plane α with coordinate planes

→ *A horizontal trace* – marked *p*
= a line of intersection of the plane α with the horizontal plane

→ *A vertical trace* – marked *n*
= a line of intersection of a plane α with the vertical plane

→ *A side trace* – marked *m*
= a line of intersection of a plane α with the side plane

– If a line lies in a plane, then its trace points lie on the traces of a plane.