

CONSTRUCTION OF SOLIDS IN MP

Exercise

In MP construct related views of the regular prism, the square $ABCD$ is the base, the vertex A of the lower base lies on the given line $a: [-20,30,-10], [0,10,20]$, the centers $S[20,30,35]$ and $S'[-30,70,65]$ of both bases are given.

Steps of construction:

1. IIIb...construct the perpendicular plane to the axis passing through the point S (by connecting points S' and S we get the axis of the prism, the known fact is that the axis is perpendicular to the plane of the base and passes through the point S) ... α
2. IIb... construct the intersection of the line a with the plane α of the base to obtain the vertex A of the base
3. IVb...construct the base which is a square given by the center S and one point A (in MP the projection of the square is a parallelogram, use the rotation of the plane of the base)

Exercise

In MP construct related views of the right circular cone, if the center of the base $S[20,65,40]$, the main vertex (the apex) $V[-50,50,80]$ of the cone and the point $M[-20,40,50]$ on the lateral surface area are given.

Steps of construction:

1. IIIb...construct the perpendicular plane to the axis passing through the point S (by connecting points V and S we get the axis of the cone)... α
2. IIb... construct the intersection of the line VM with the plane α of the base to obtain one point A of the base
3. construct the base which is a circle given by the center S and one point A (in MP the projection of the circle is an ellipse, use tipping and trammel construction)

Exercise

In MP construct related views of the regular pyramid with a square $ABCD$ as the base, the plane $\alpha(-60,60,70)$ of the base, the point $A[25,?,70]$ of the base, the center $S[10,30,?]$ of the base and a height $h=60$ of the pyramid are given. The main vertex (apex) of the pyramid lies above the plane of the base.

Steps of construction:

1. IIIa...construct the perpendicular line o to the plane α passing through the point S (we know that the axis of the solid is perpendicular to the plane of the base and that the point S lies on it) ... o
2. IVa...find the apex V ... it lies on the axis in the distance 60 from the point S (use the tipping of the axis)
3. IVb... construct the base which is a square given by the center S and one point A (in MP the projection of the square is a parallelogram, use the rotation of the plane of the base)