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Perpendicularity of a Straight Line to a Plane and a Plane to a Plane

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Annotation : To develop students' understanding of the straight line to the plane and the perpendicularity of the plane to each other, and to develop skills and competencies to work on related issues. Problem statement: construction of a plane by coordinates, analysis of a straight line to the plane and the perpendicularity of the plane to each other. The trainee must complete the option on A3 paper using the appropriate tools.

The perpendicularity of a straight line to a plane

Definition. If a straight line is perpendicular to two intersecting straight lines in the plane, then that straight line is also perpendicular to the plane.

Bunda$b \subset P$and$c \subset P$, $b \cap c$and$a \perp b$and$a \perp c$if, $a \perp P$will be(Figure 1). This means that a straight line perpendicular to a plane is also perpendicular to the principal lines of the plane. Suppose that the straight line a is perpendicular to the horizontal h and the frontal f of the plane (Fig. 2a).

According to the projection property of the right angle $\angle AKD=90^o$as, $KD \parallel H$is a horizontal projection of a right angle $\angle A'K'D'=90^o$ bo'ladi. Demak, $A'K' \perp C'D'$ or$a' \perp h'$ will be.

For a straight line in space to be perpendicular to the plane, its horizontal projection must be perpendicular to the horizontal projection of the plane, the frontal projection must be perpendicular to the frontal projection of the plane, and the profile projection must be perpendicular to the profile projection of the plane profile.

Many metric problems can be solved using the condition that a straight line and a plane are perpendicular to each other.

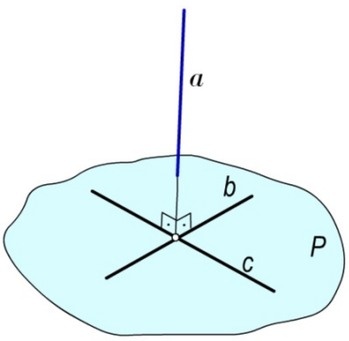
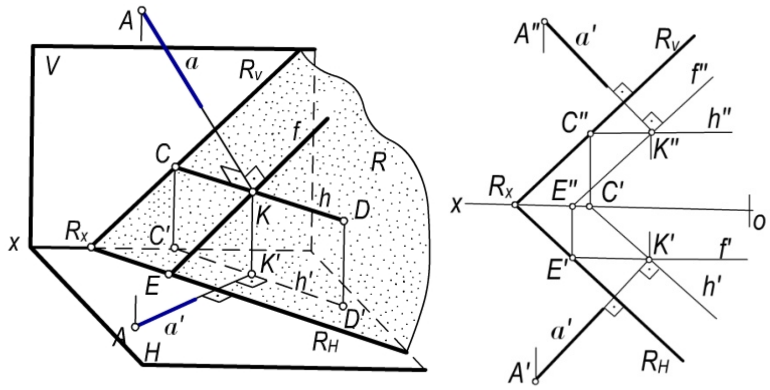


Figure 1



a) b)

Figure 2

Issue 1.ΔABCperpendicular to the plane A given by (Fig. 4).

Solve.Let's solve the problem by the following algorithm.

1. ΔABC ($\Delta A'B'C'$, $\Delta A''B''C''$) of the plane$h(h', h'')$ horizontal and f(f', f'')frontal.

2. of point A of the planeA' andA'' at any length from the projections$A'E' \perp h'$ va $A''E'' \perp f''$ so that the projections of the perpendicular are made.

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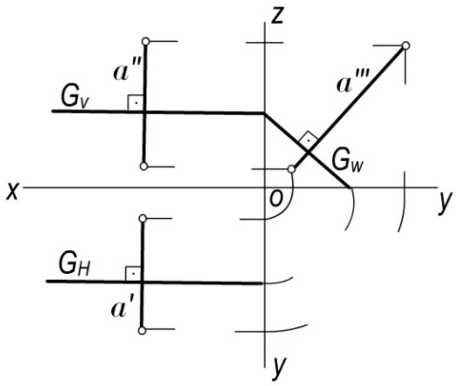

Figure 3

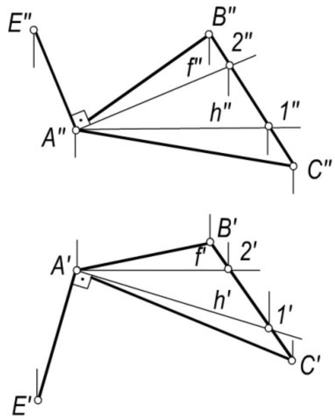

Figure 4

Issue 2. $A(A', A'')$ through the point $l(l', l'')$ draw a plane perpendicular to the straight line (Figure 5).

Solve. For this:

A point A' and A'' projections $h' \perp l'$ and $h'' \| Ox$ projections of the horizontal of the plane sought;

A of the point A' and A'' projections $f' \| Ox$ va $f'' \perp l''$ projections of the plane frontal;

formed $h \cap f (h' \cap f' \wedge h'' \cap f'')$ the intersecting lines represent the plane sought.

The horizon of the plane $h \perp l$ and frontal $f \perp l$ and because it is frontal, this plane is perpendicular to the straight line l.

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