Nacrtna geometrija i tehničko crtanje

*architecture edition

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saradnik_Dajana Papaz

Način rada na predmetu

Rad na času + domaća zadaća		10
Kolkvijumi	2x20=	40
Pismeni ispit		40
Usmeni ispit (nije obavezan)		10

4 ECTS 2+2

Za rad na času potreban pribor za crtanje: 2 trougla: 45o i 60o, obične/tehničke olovke, šestar, olovke u boji, A3 papir (podloge za rad se nalaze na stranici predmeta), sveska bez linija

Literatura

Vizuelizacija i modelovanje
Deskriptivna geometrija
Nacrtna geometrija
Konstruktivna geometrija
Inženjerska grafika

1. V. Đurović: Nacrtna geometrija, Naučna knjiga, Beograd, II_1950, XIV_1993
2. Lj. Gagić, Nacrtna geometrija, Akademska misao, Beograd, III_1986, X_2002
3. Ž. Babić: Nacrtna geometrija, MF Banja Luka, 2010
4. A. Čučaković, S. Živanović : Zbirka zadataka iz nacrtne geometrije i perspektive sa rešenim primerima, Akademska misao, Beograd, 2004
5. V. Niče: Deskriptivna geometrija, Zagreb, III_1963
6. J. Justinijanović: Nacrtna geometrija I i II, Školska knjiga, Zagreb, 1968
7. M. Stavrić, D. Stokić, M. Ilić, Priručnik za predavanja i ispit za Nacrtnu geometriju i Vizualizaciju i modelovanje, Banja Luka, 2011

Cilj predmeta

Cilj predmeta je da osposobi studente za shvatanje trodimenzionalnog prostora i njegovo grafičko predstavljanje u ravni crteža, transformisanje i deformisanje likova i prostornih struktura koje se koriste u arhitekturi, kao i upotrebu raznovrsnih konstruktivnih postupaka za njihovu obradu.

Cilj predmeta je da naučite da razmišljate prostorno...i da onda da to i nacrtate tako da drugi znaju šta ste mislili.

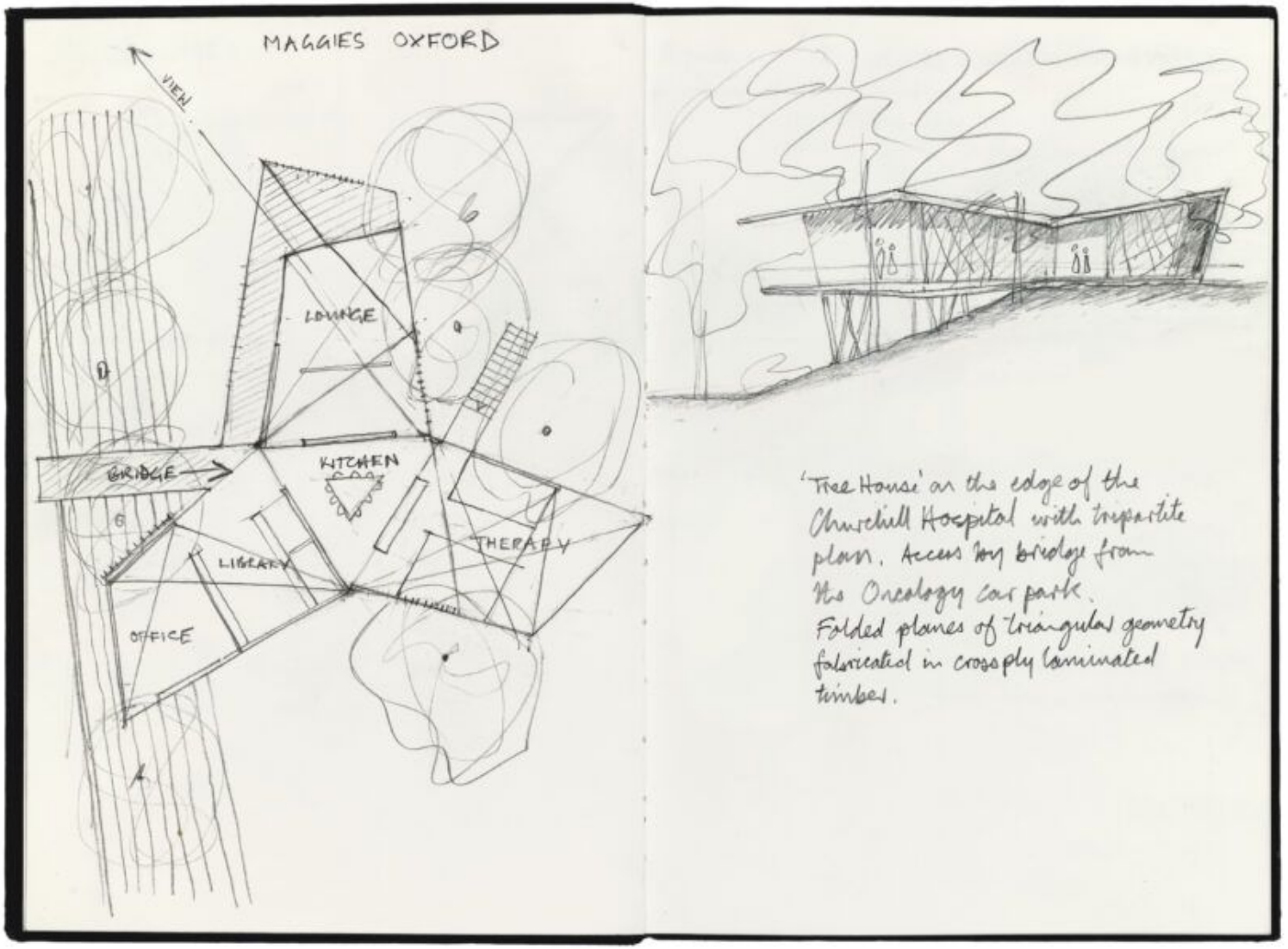
Tehnički crtež treba biti **jednostavan, precizan i jasan. On je sastavni dio tehničke dokumentacije.**

Nacrtna geometrija je naučna osnova tehničkog crteža.

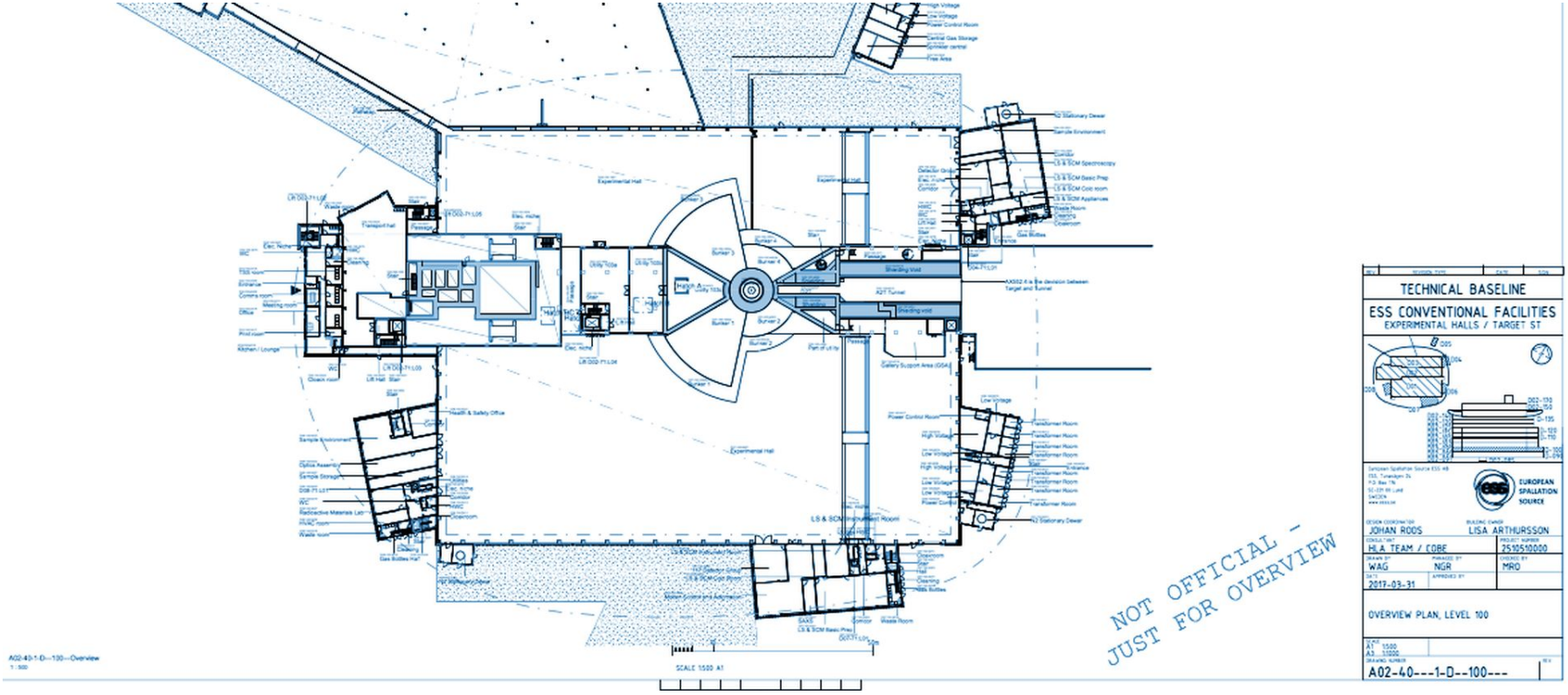
Nacrtna geometrija je nauka o metodama koje omogućuju prikazivanje **trodimenzionalnog oblika** i rješavanje prostornih problema crtežom na **dvodimenzionalnoj** ravni konstruktivno geometrijskim postupkom.

Svaki problem treba najprije dobro **prostorno shvatiti** i **misaono riješiti u prostoru** pa tek onda metodama nacrtne geometrije riješiti crtanjem.

Skica

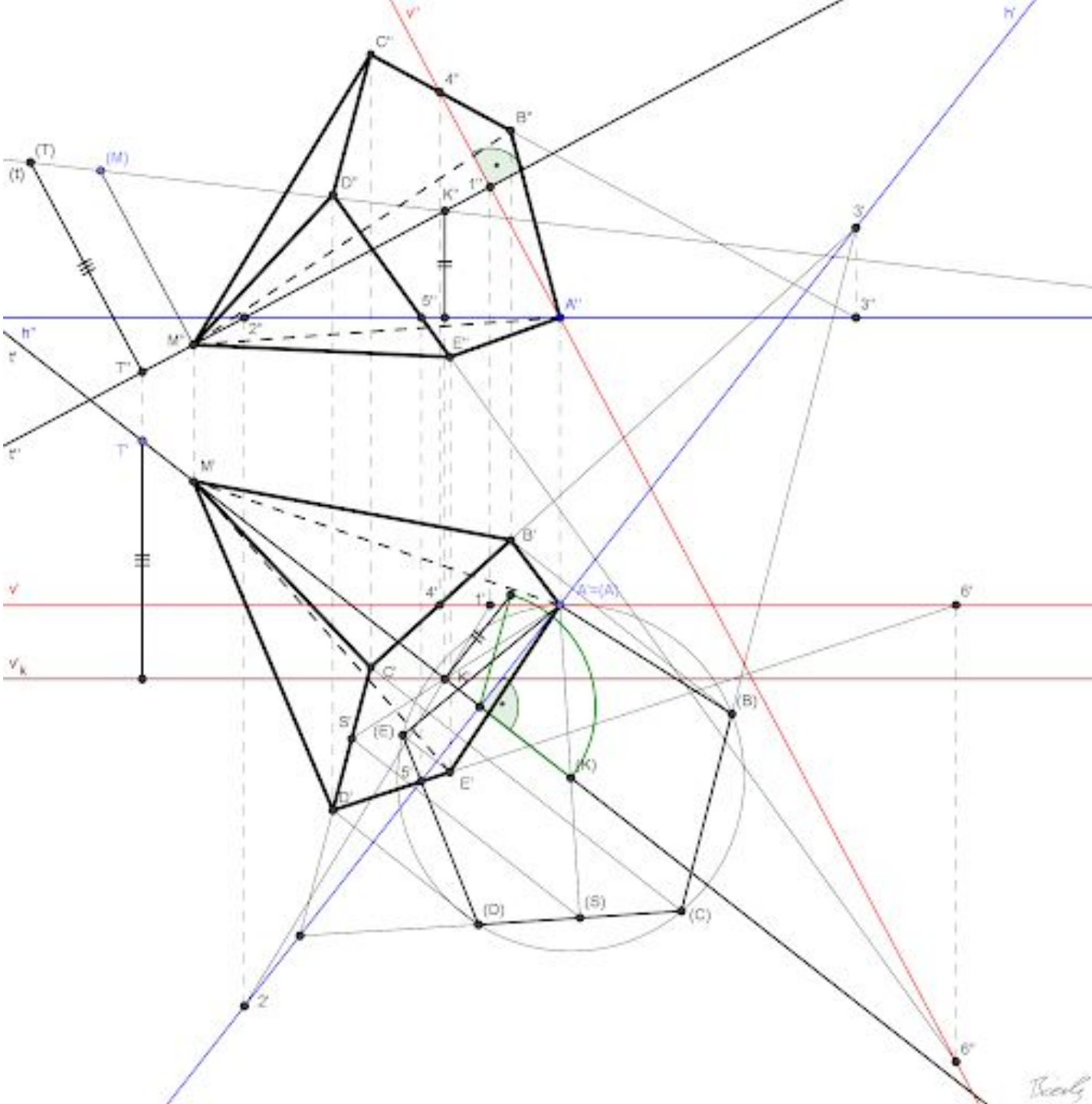

MAGGIES OXFORD
VIEW
LOUNGE
KITCHEN
BRIDGE
LIBRARY
THERAPY
OFFICE
'Tree House' on the edge of the Churchill Hospital with tripartite plans. Access by bridge from the Oncology car park.
Folded planes of triangular geometry fabricated in cross ply laminated timber.

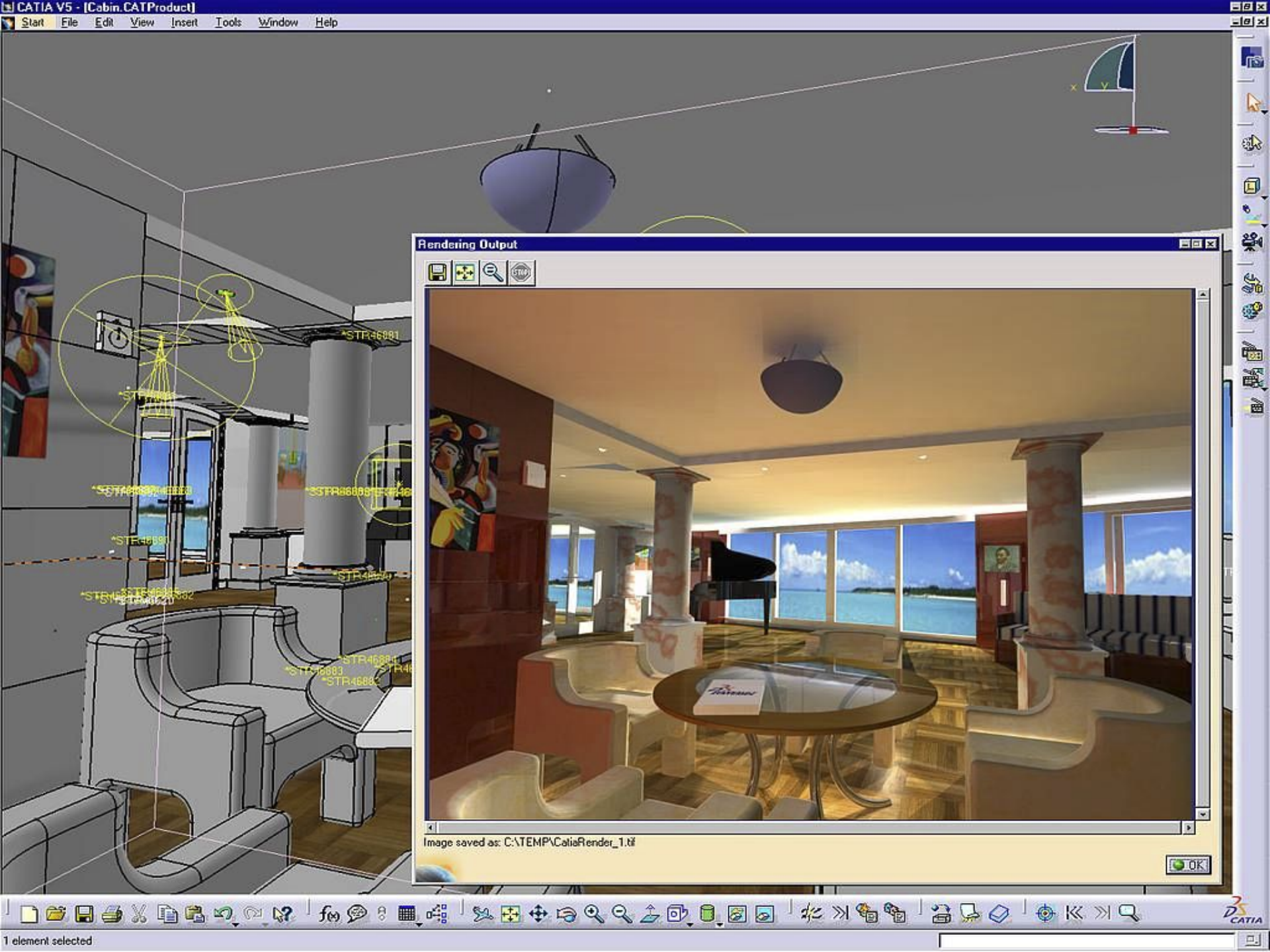
Tehnički crtež



Tehnički crtež

...također

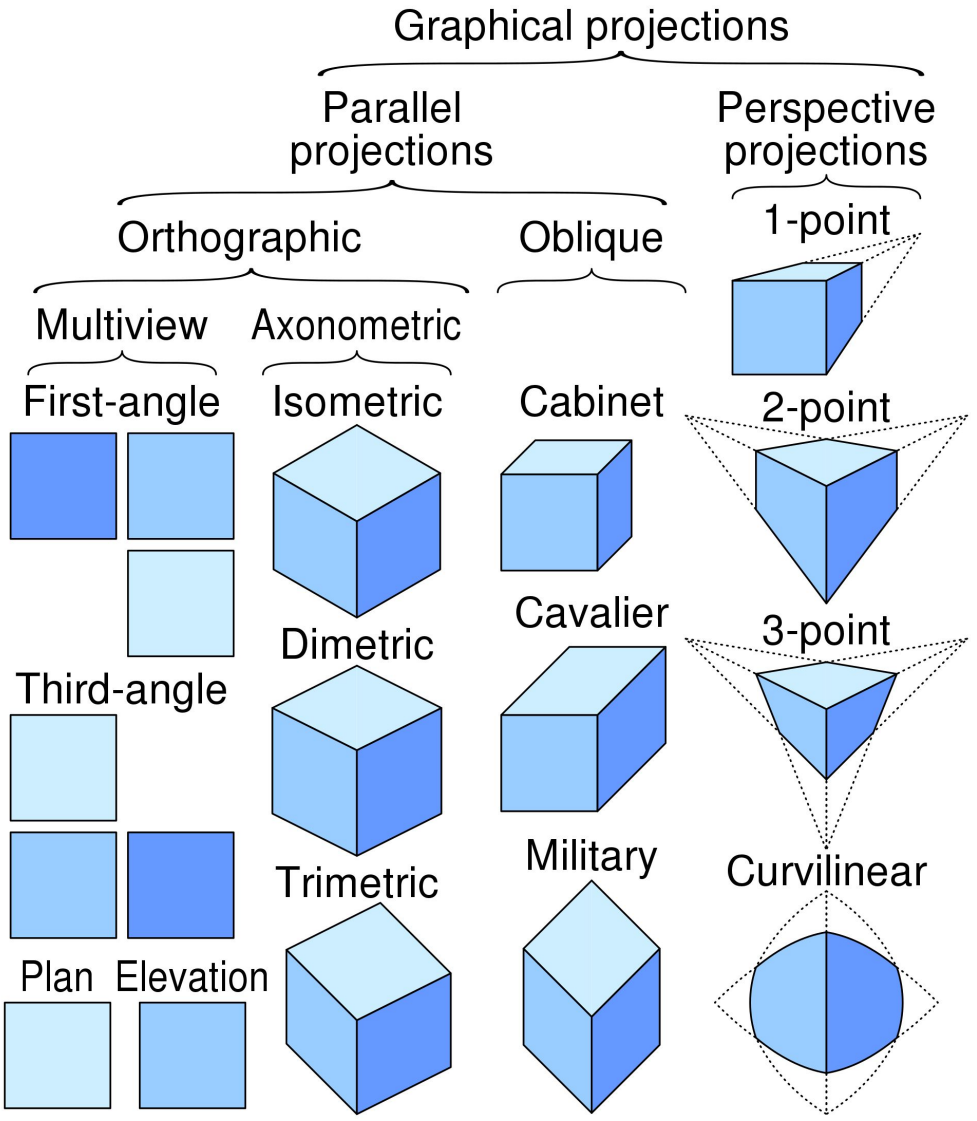



CATIA V5 - [Cabin.CATProduct]
Start File Edit View Insert Tools Window Help
Rendering Output
Image saved as: C:\TEMP\CatiaRender_1.tif
OK
1 element selected

Projekcije

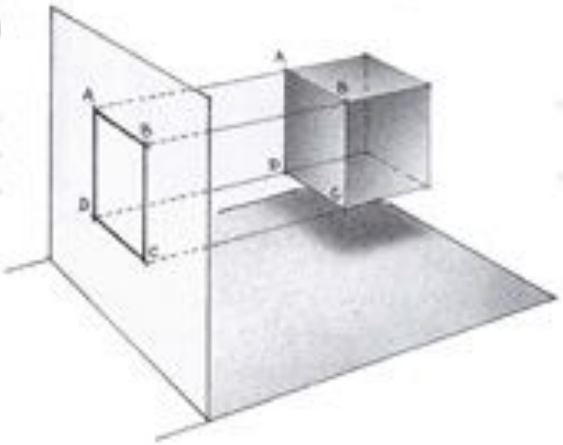
paralelno projiciranje

centralno projiciranje



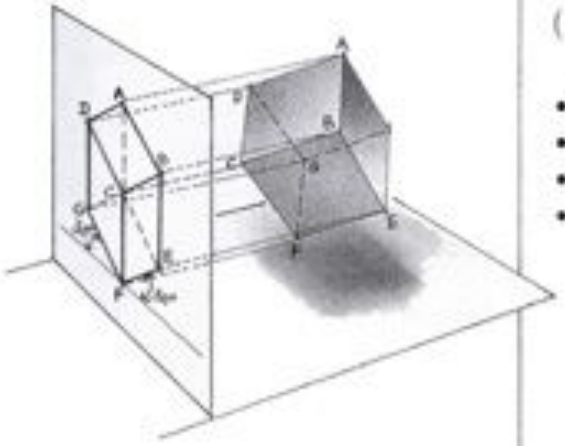
1 Orthographic Multiview Projection (Multiview)

- Plan •
- Elevation •
- Section •



2 Axonometric Single-View Projection (Paraline)

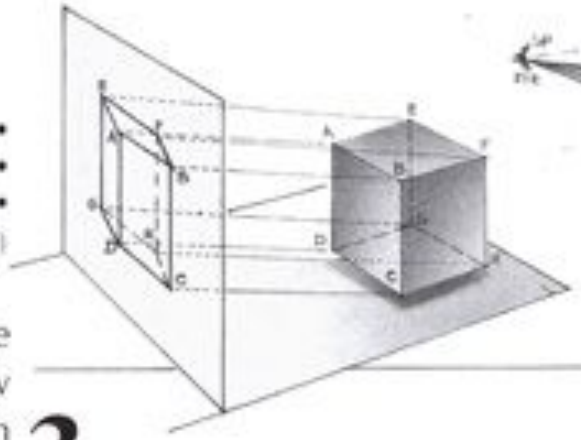
- Isometric
- Dimetric
- Trimetric
- Transmetric (only two sides)



3 Oblique Single-View Projection (Paraline)

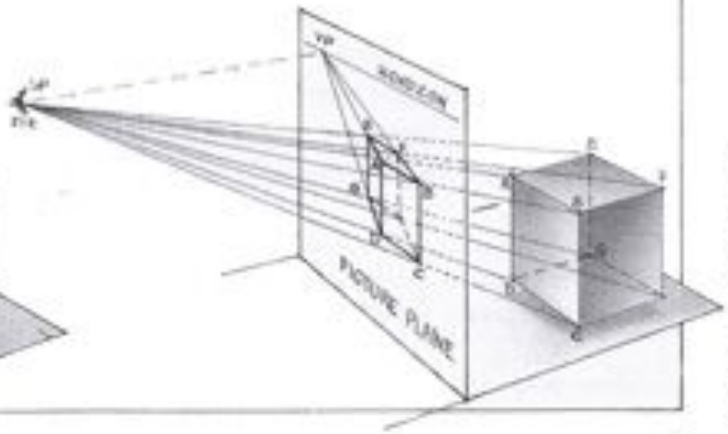
- Plan Oblique •
- evation Oblique •
- Transoblique •

(only two sides)

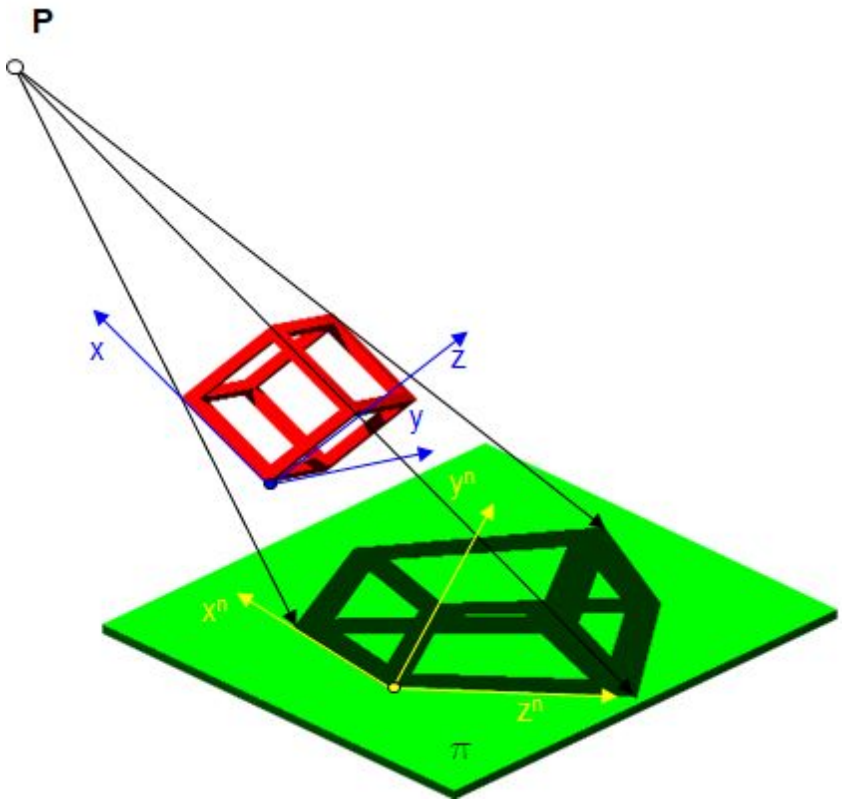


4 Central Single-View Projection (Perspective)

- One-Point Perspective
- Two-Point Perspective
- Three-Point Perspective
- Multipoint Perspective

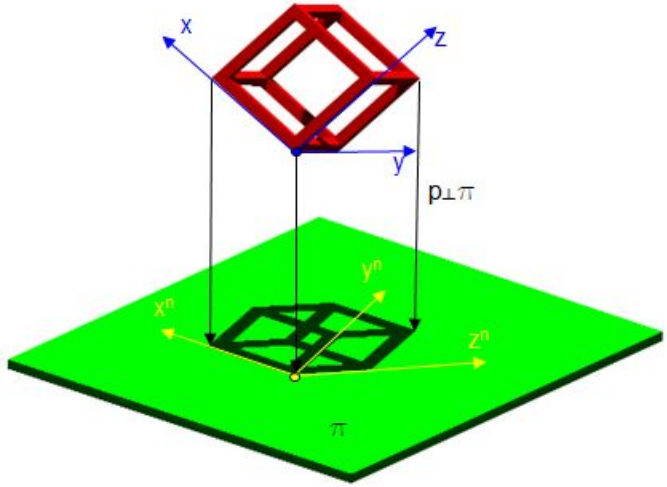


Centralna projekcija

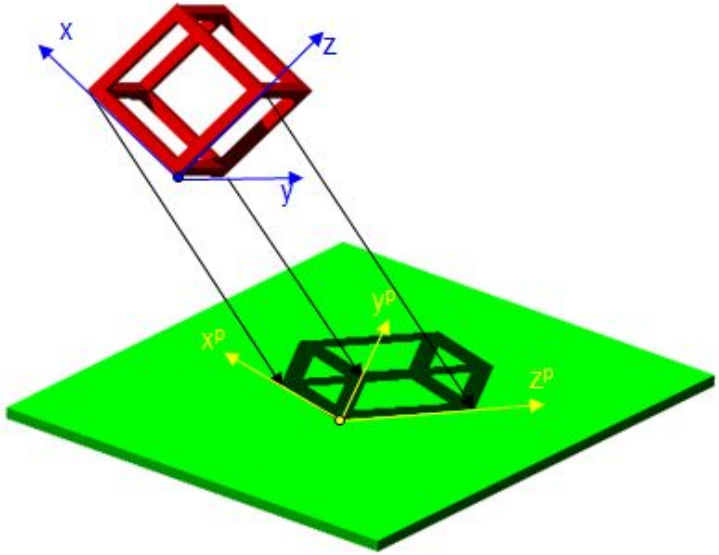


Paralelna projekcija

Ortogonalna

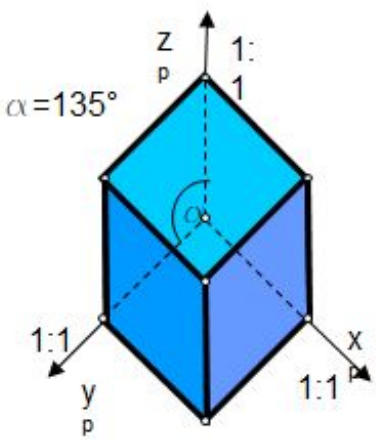


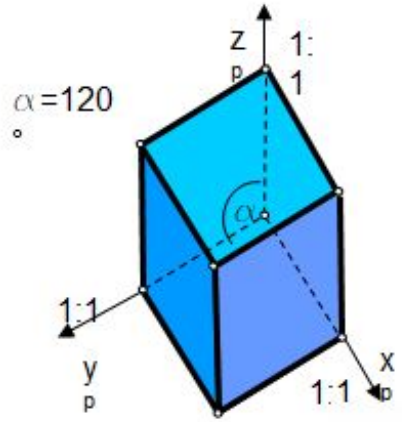
Kosa

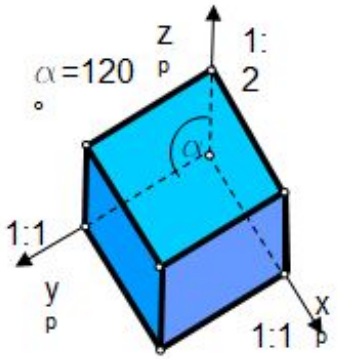


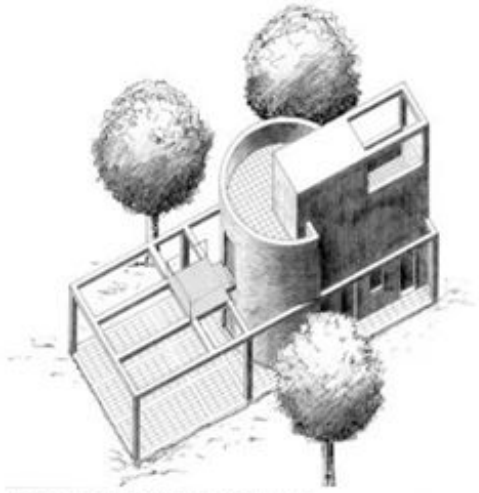
paralelna projekcija

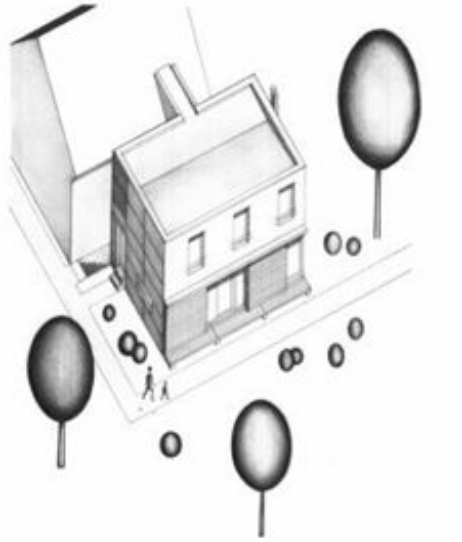
Aksonometrija





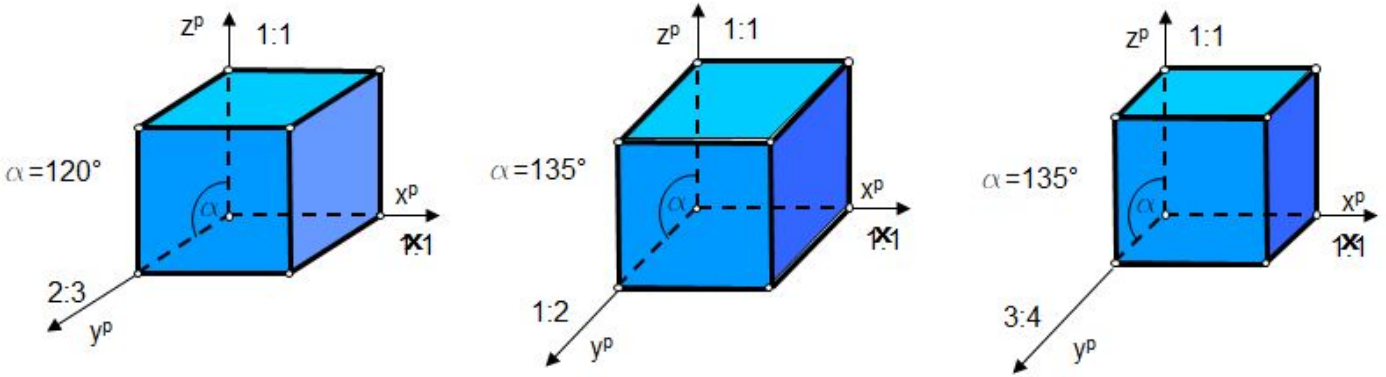




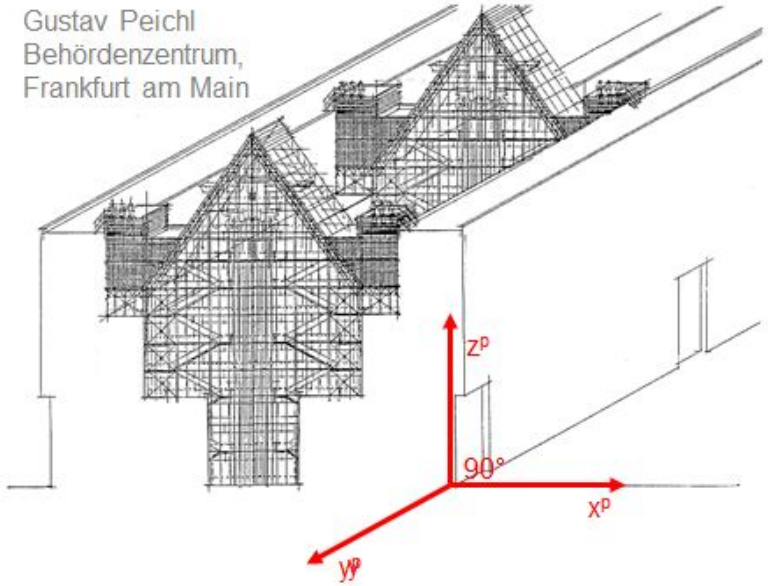


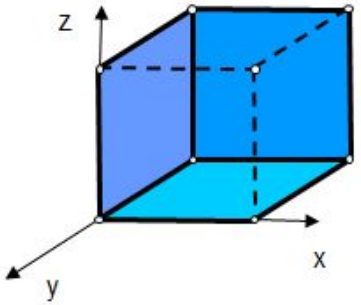
paralelna projekcija

Kosa projekcija



Pogodne vrednosti elemenata za crtanje frontalne aksonometrije

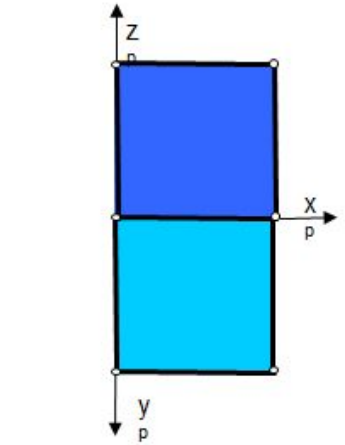


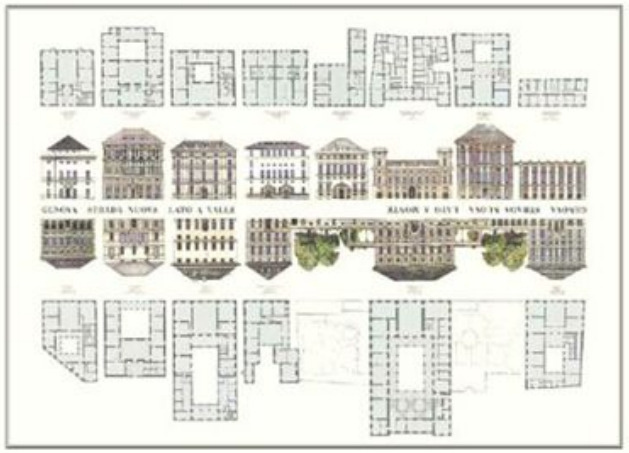


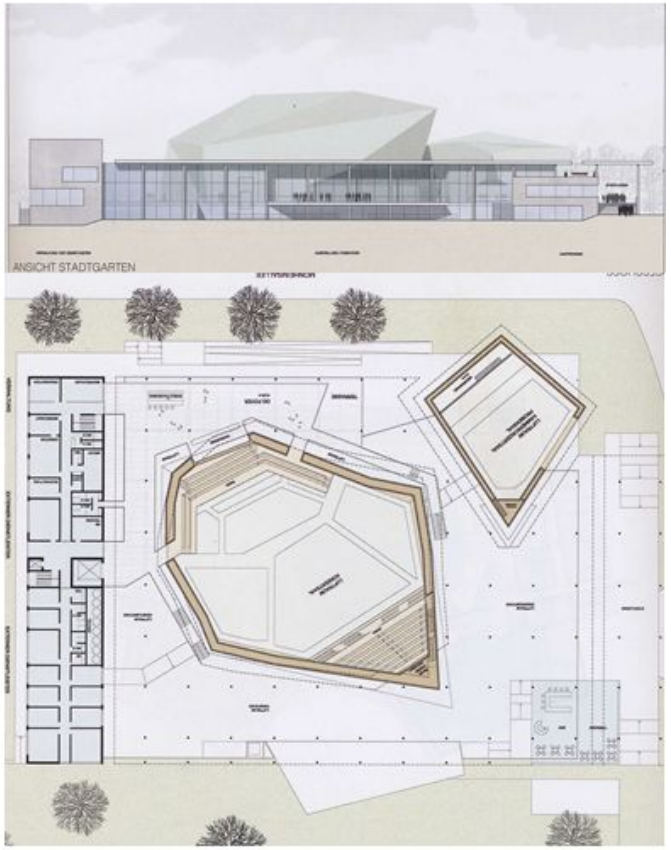
Sloboda izbora vidljivosti

paralelna projekcija

Ortogonalna projekcija

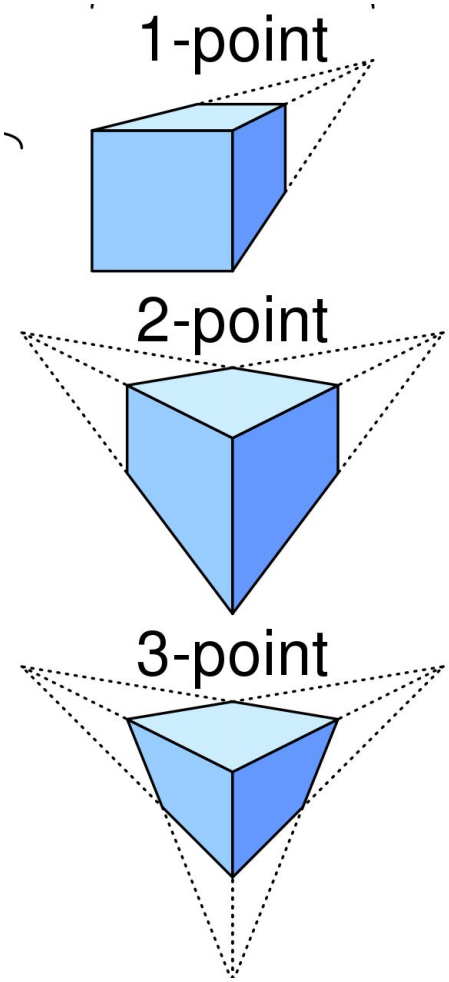




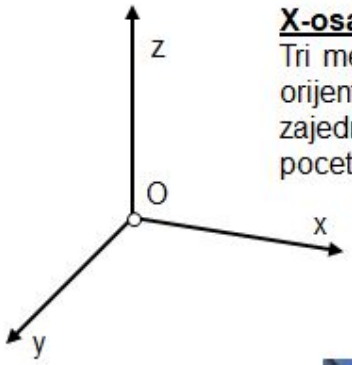


centralna projekcija

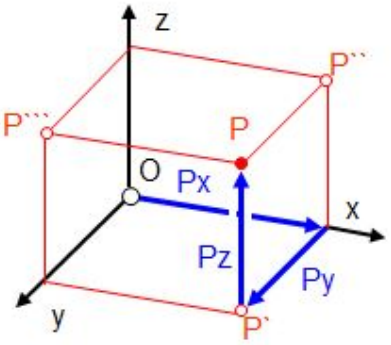
Perspektiva



Koordinatni sistemi

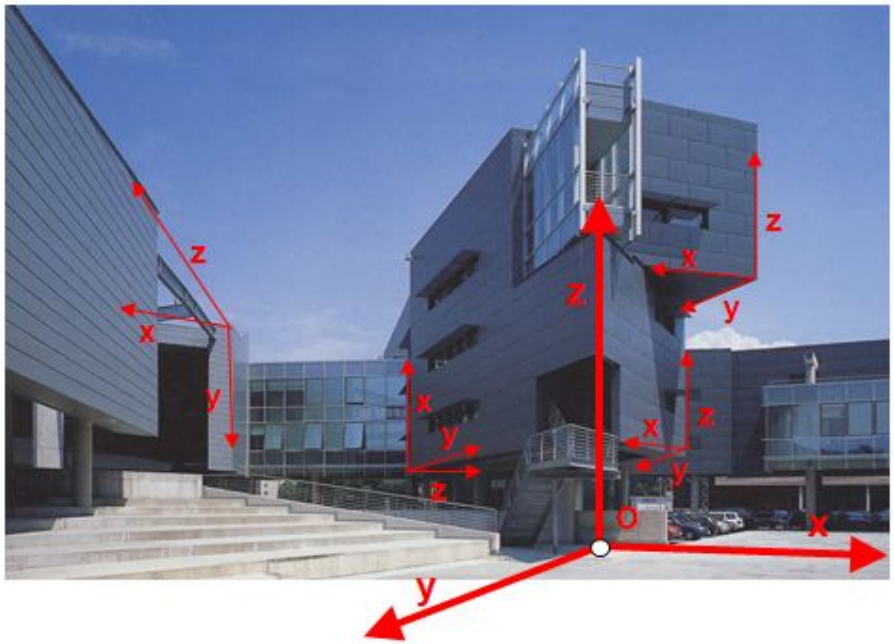


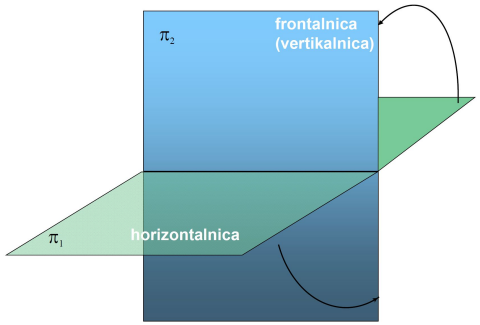
X-osa, Y-osa, Z-osa:
Tri medjusobno orogonalna orijentisana pravca kroz jednu zajednicku tacku **O** (koordinatni pocetak)



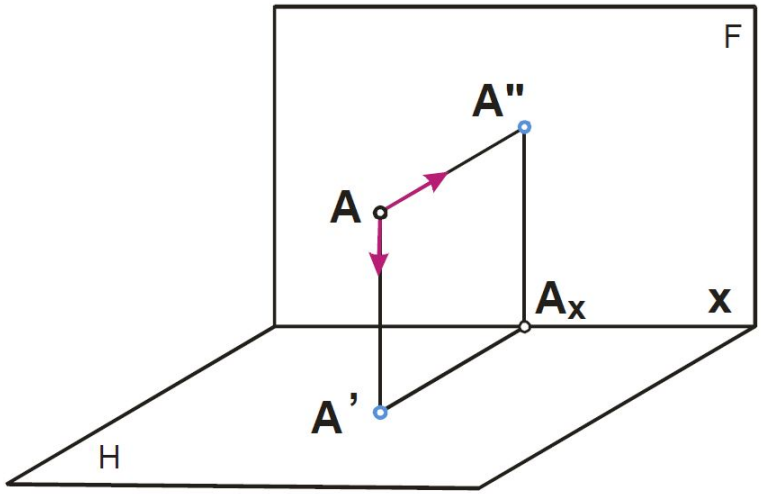
P- tacka u prostoru
P`- prva projekcija tacke
P``- druga projekcija tacke
P```- treca projekcija tacke

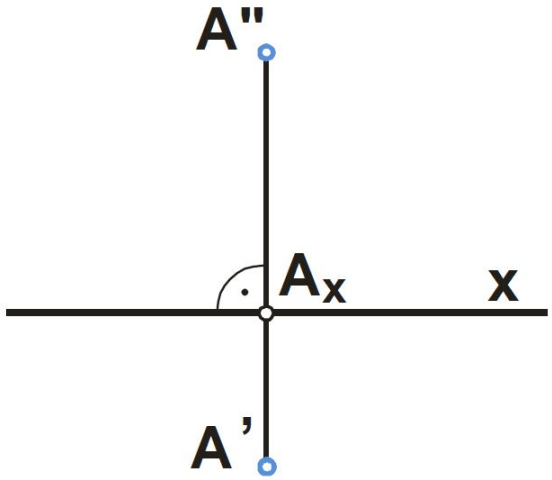
Px- apsolutna vrednost u x pravcu
Py- apsolutna vrednost u y pravcu
Pz- apsolutna vrednost u z pravcu





Projekcije tačke

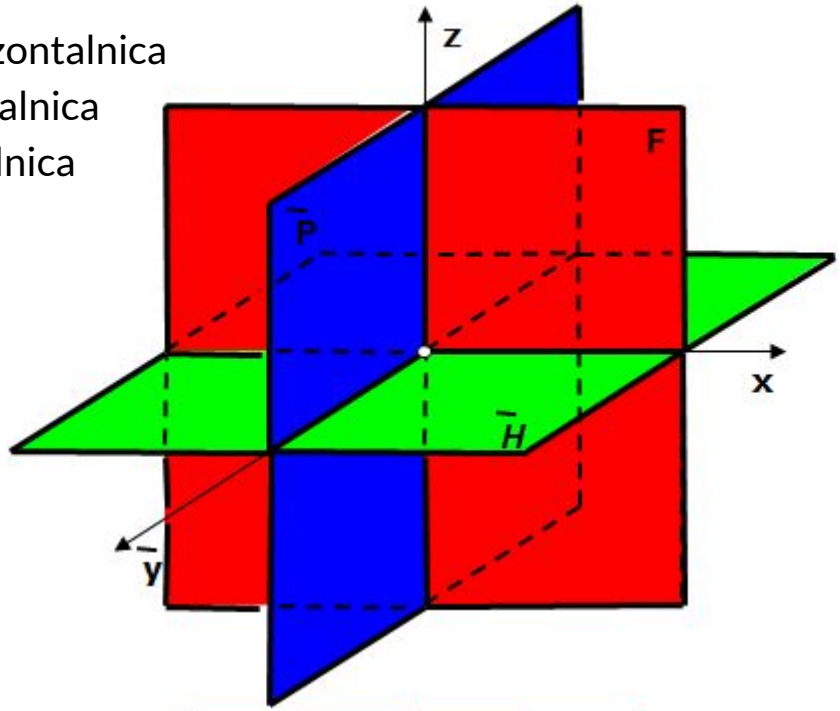


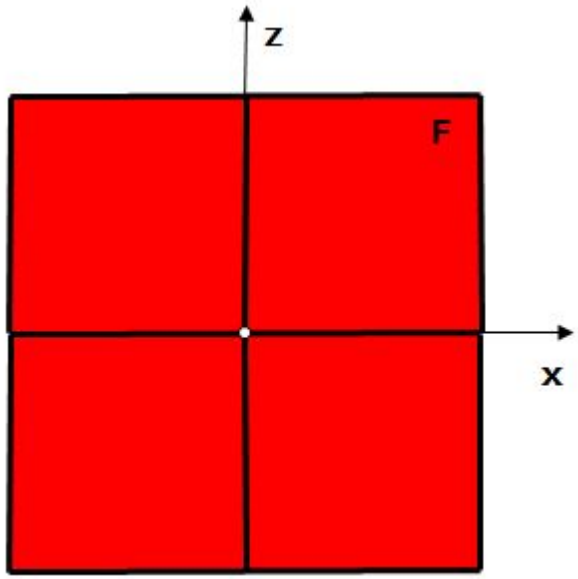


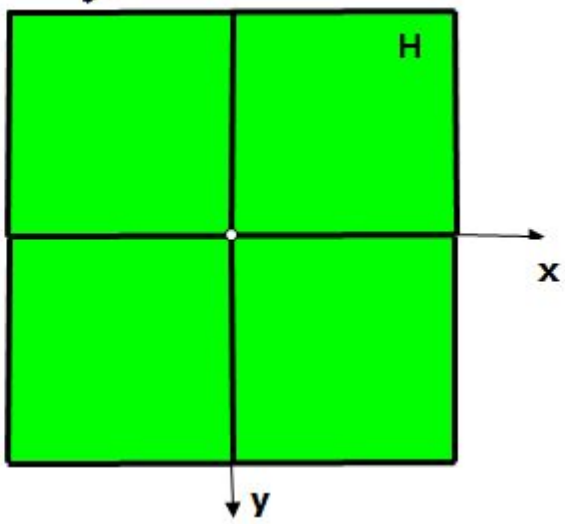
A'A"-ordinala

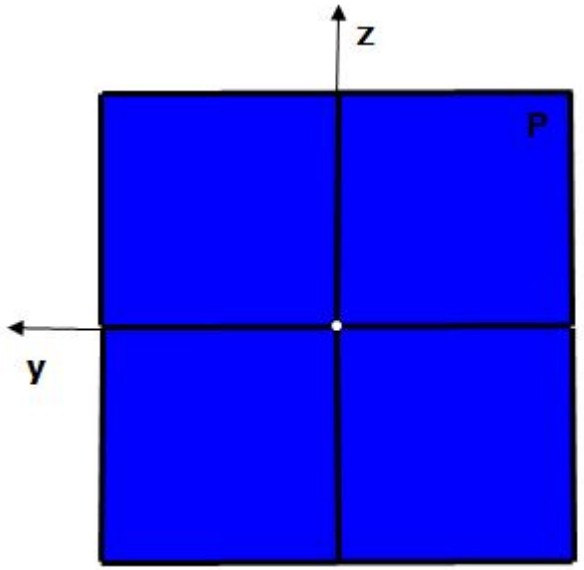
Položaj tačke u prostoru potpuno je **određen sa dvije projekcije**:
- **tlocrt A'** (projekcija na horizontalnu ravan) i
- **nacrt A"** (projekcija na vertikalnu ravan)

H horizontalnica
F frontalnica
P profilnica

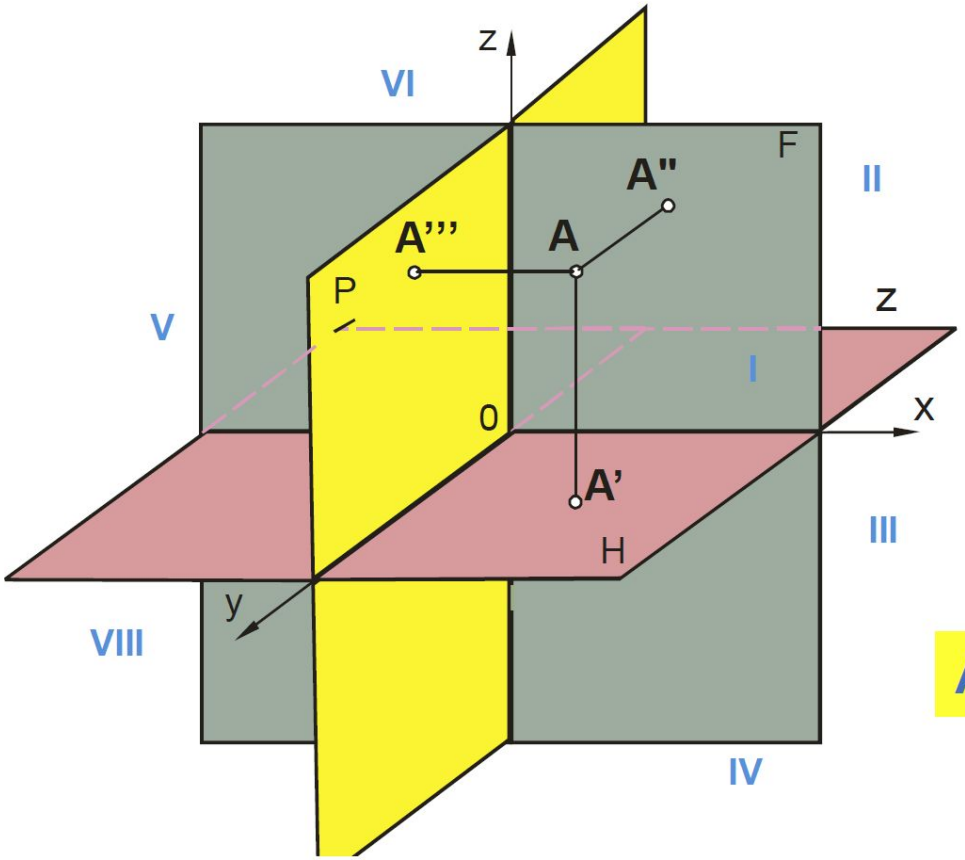


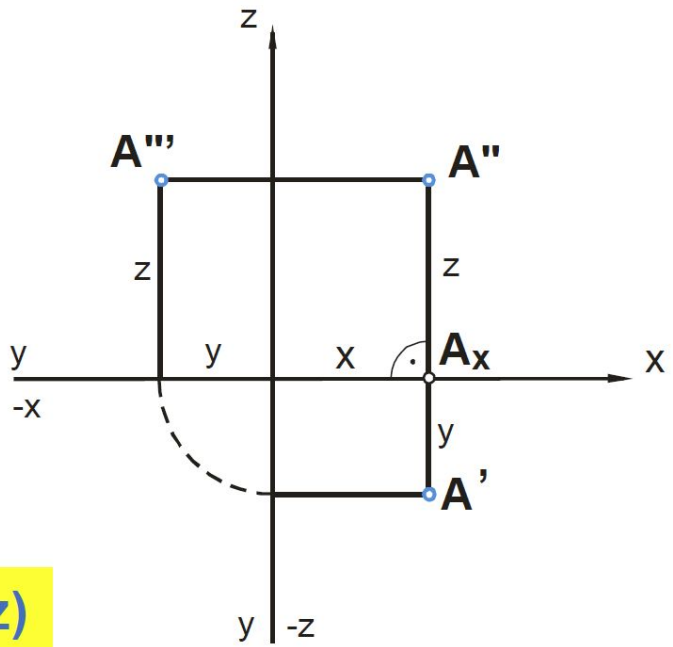






Tačka u prostoru. Oktanti





A (x, y, z)

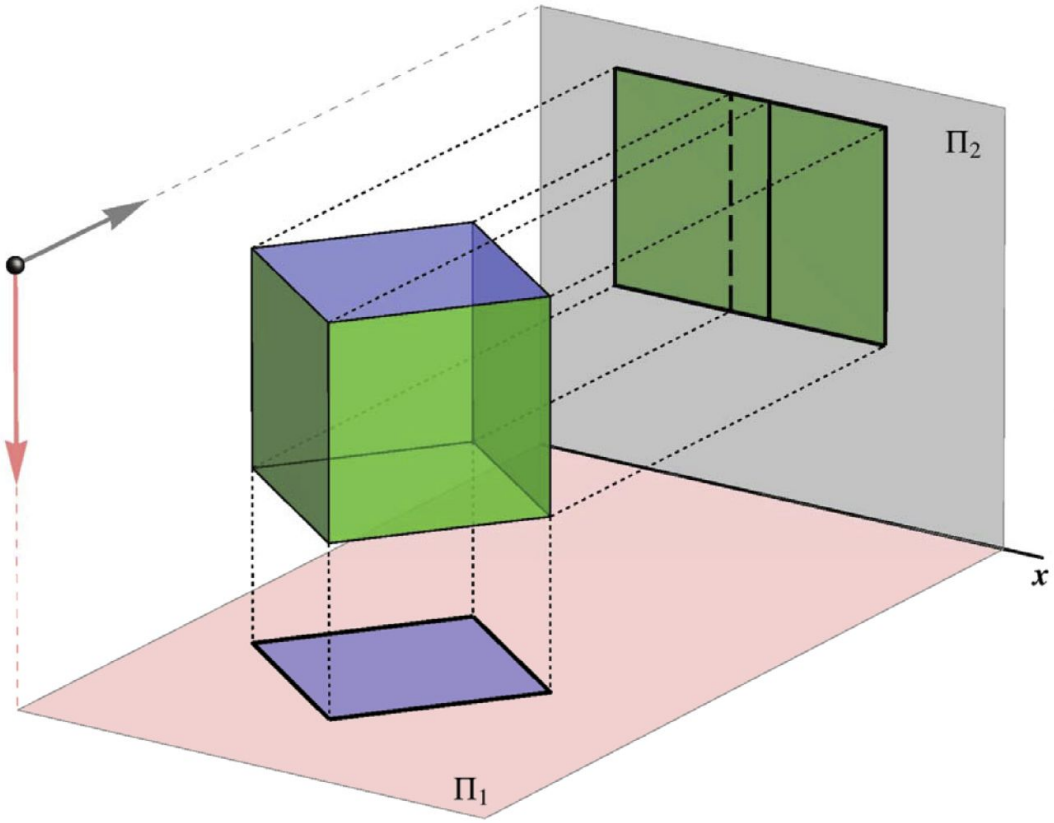
Zadačići

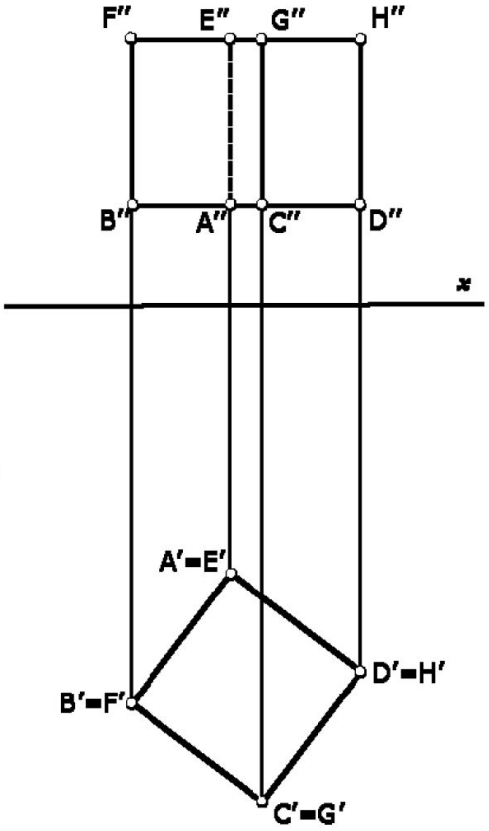
Nacrtati projekcije tačaka i odrediti u kom su oktantu:

A(2, -3,4)
B(3,-2,-3)
C(-3,0,1)
D(-2,-3,-4)

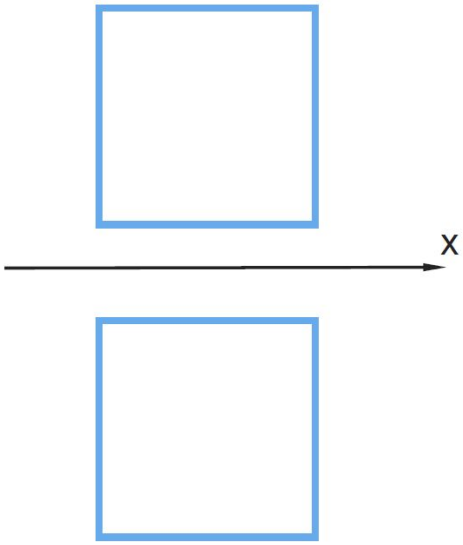
Koje koordinate ima tačka koja je od koordinatnog početka udaljena $5\sqrt{3}$, a sve tri ortotgonalne projekcije joj se nalaze na istom mjestu?

Projekcije tijela

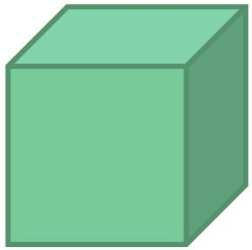




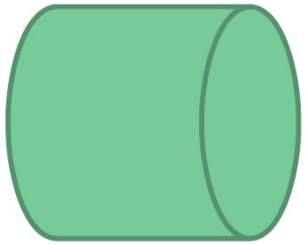
Šta je nacrtano?



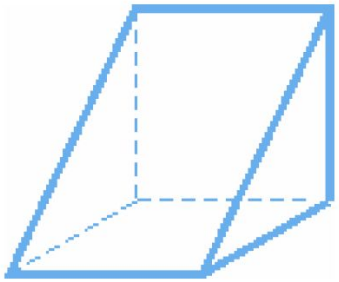
Rješenja



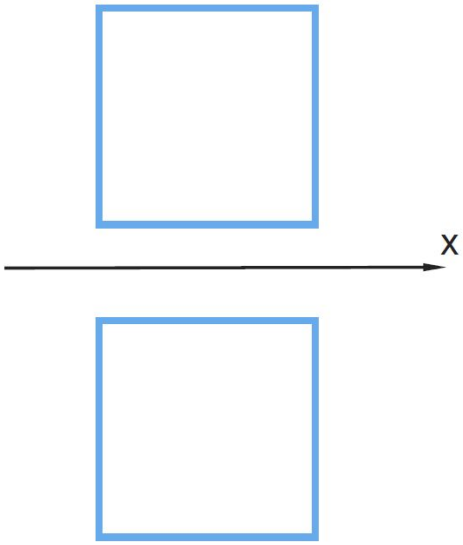
KOCKA



VALJAK



POLA KOCKE



Zadatak_slobodnom rukom

U kosoj projekciji nacrtati kocku veličine 6 cm. Kocka jednom svojom stranom leži u horizontalnici, udaljena je 2 cm desno od profilnice i nalazi se 3 cm ispred frontalnice. U nacrtanu kocku upisati kvadar kojem je visina jednaka visini kocke, a baza kvadrat duplo manji od stranice kocke. Koordinatni sistem Oxyz: kosa projekcija – xy =30°, y: yk = 1: 1.