

SISTEMA
DIÉDRICO
DIRECTO

- * ELEMENTOS :
 - PUNTOS
 - RECTAS
 - PLANOS
 - SUPERFICIES 3D.

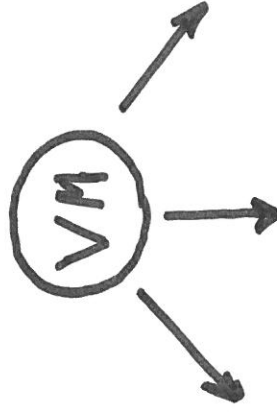
SUP. 3D

* HERRAMIENTAS:

- Intersecciones

- // y \perp

- DISTANCIAS.



• CONSTRUCCIONES.

• SUP. REGLADAS.

- PRISMAS
- CONOS
- CILINDROS

GIROS
(rectas)

PROY.
AUXILIARES

ABATIMIENTOS
(planos)

• SUP. POLIÉDRICAS.

- ⑤ TETRAEDRO
- HEXAEDRO
- OCTAEDRO
- DODECAEDRO
- ICOSAEDRO

(cambios de plano)

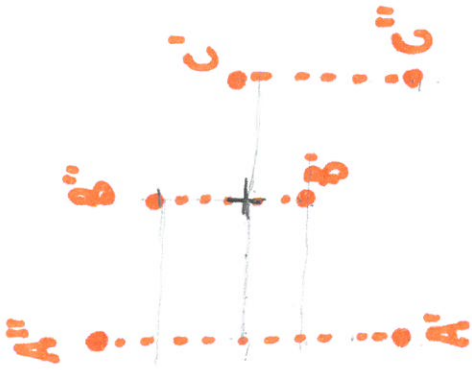
VISTAS VM

↳ DESARROLLO

(con sección o no)

① PUNTOS

PROYECCIONES

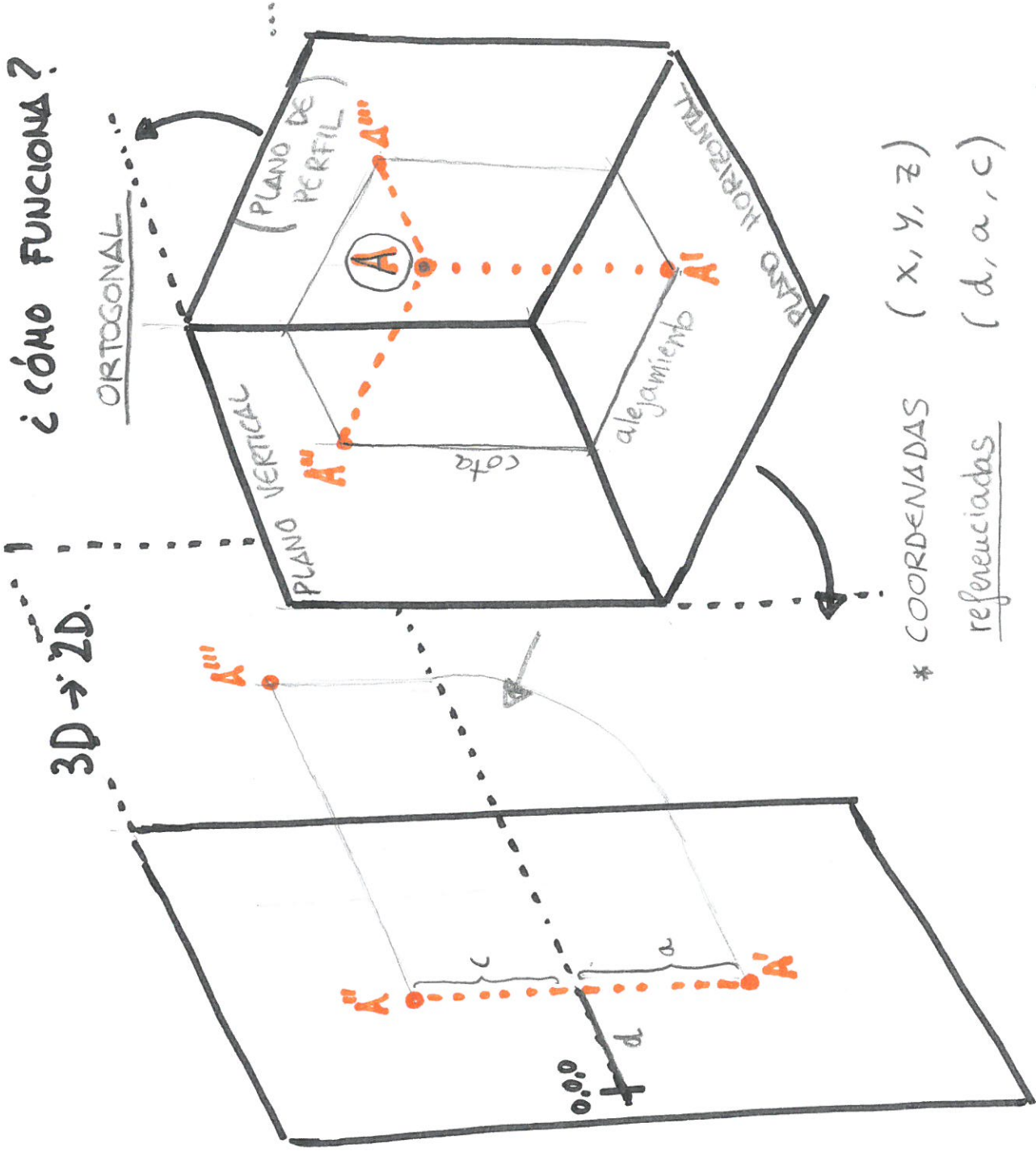


$B (0, 10, 20)$

$A_B (-30, 20, 10)$

$C_B (+30, -10, -50)$

¿CÓMO FUNCIONA?



* COORDENADAS (x, y, z)

referenciadas (d, a, c)

distancia, alejamiento, cota

② RECTAS

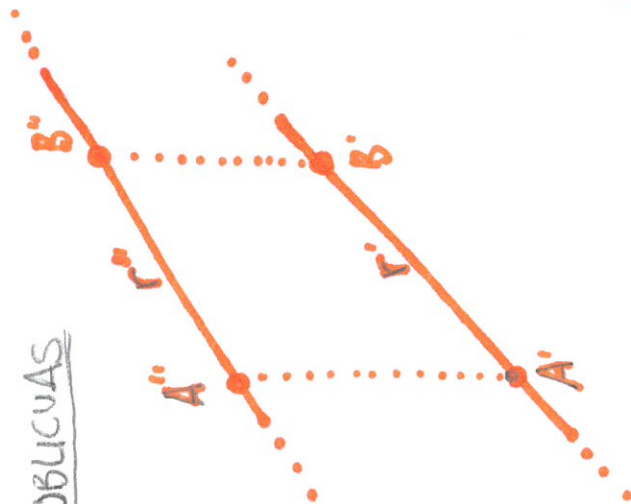
TIPOS DE RECTAS:

→ POSICIÓN →

PROYECCIONES.

con 2 puntos.

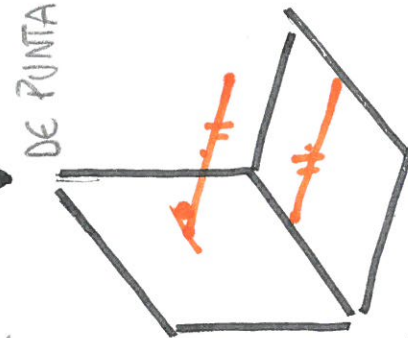
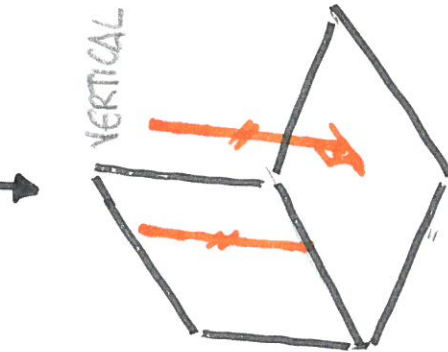
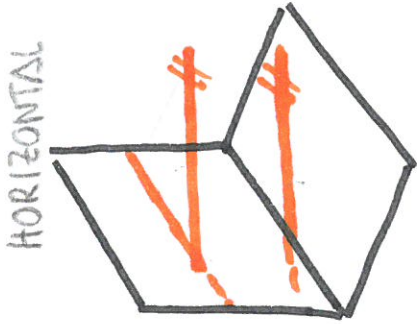
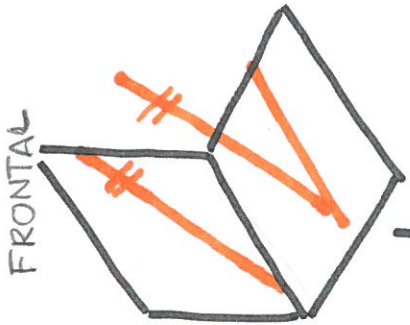
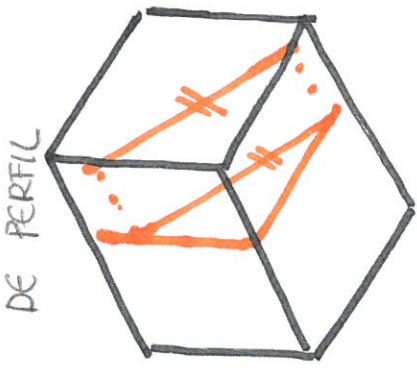
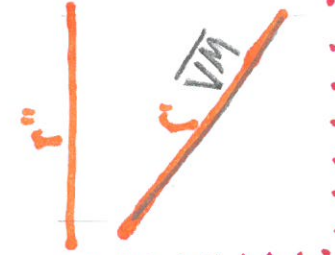
OBLICUAS



FRONTAL

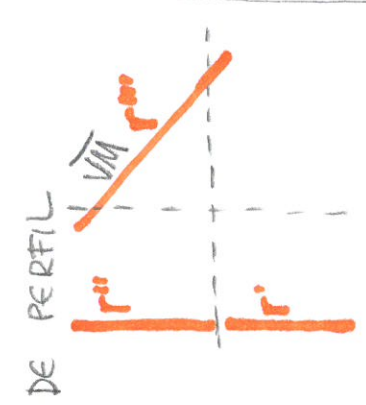
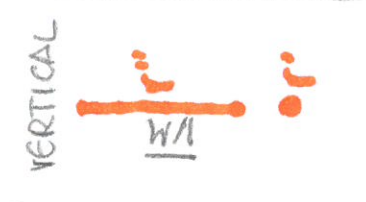
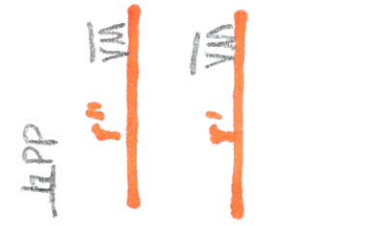
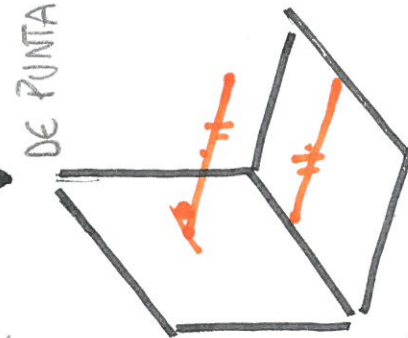
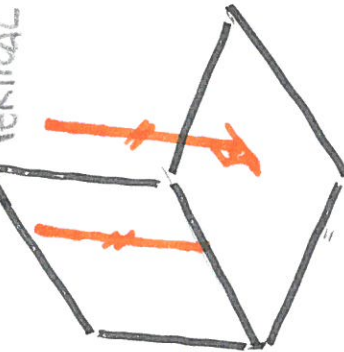
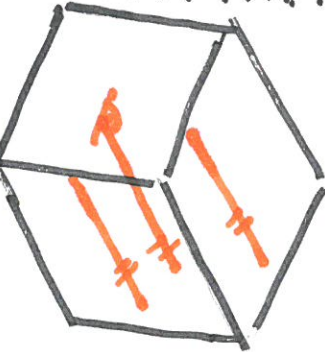
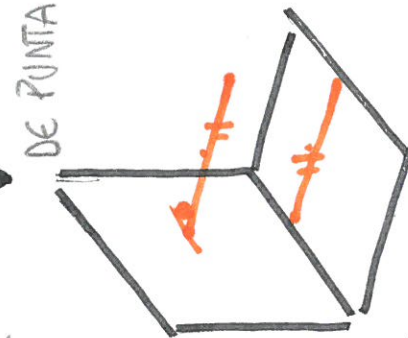
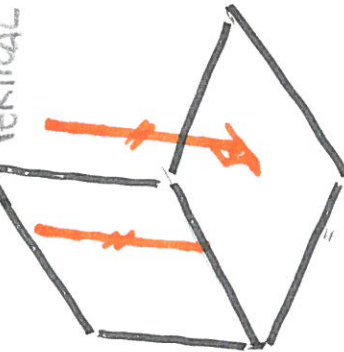
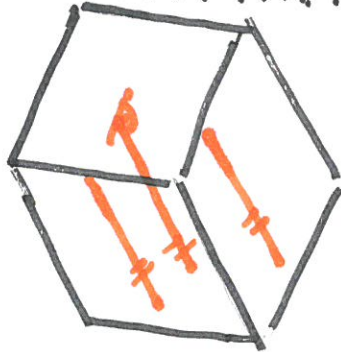


HORIZONTAL



OBLICUAS

h. PP.

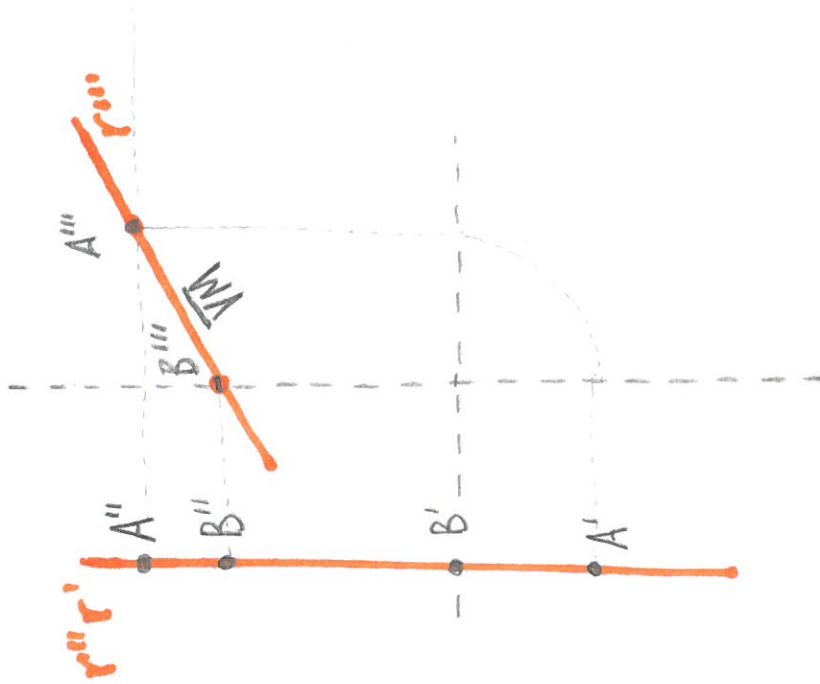


...

③ PROYECCIÓN

EN EL PERFIL

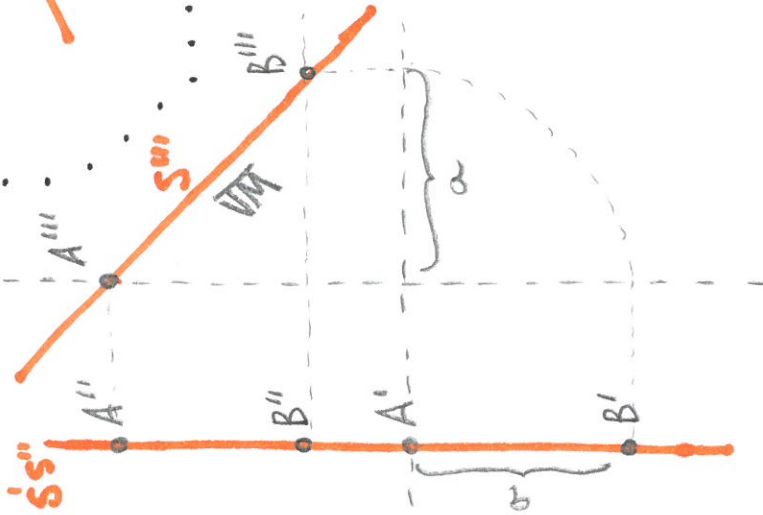
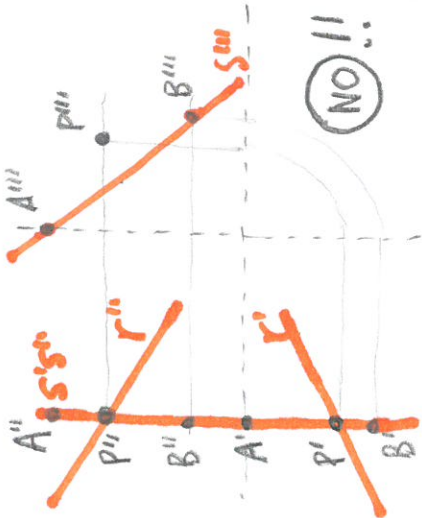
+ DATOS { PUNTOS
ÁNGULOS



- * LA COTA SE MANTIENE
- * EL ALEJAMIENTO GIRA

EJERCICIO:

¿SE CORTAN LAS RECTAS?



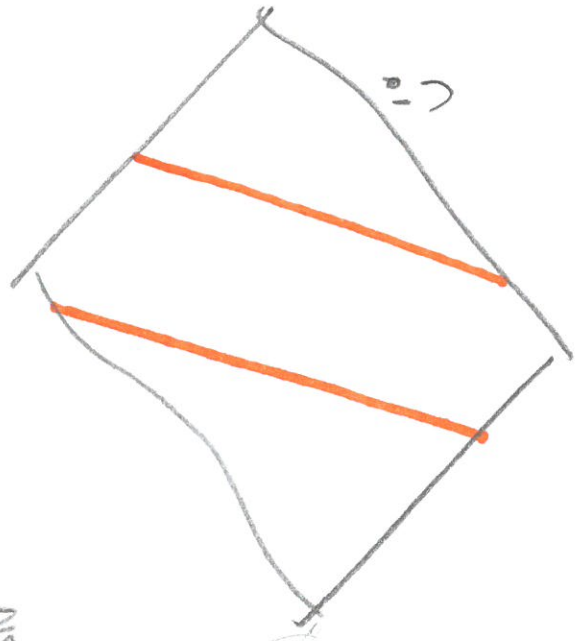
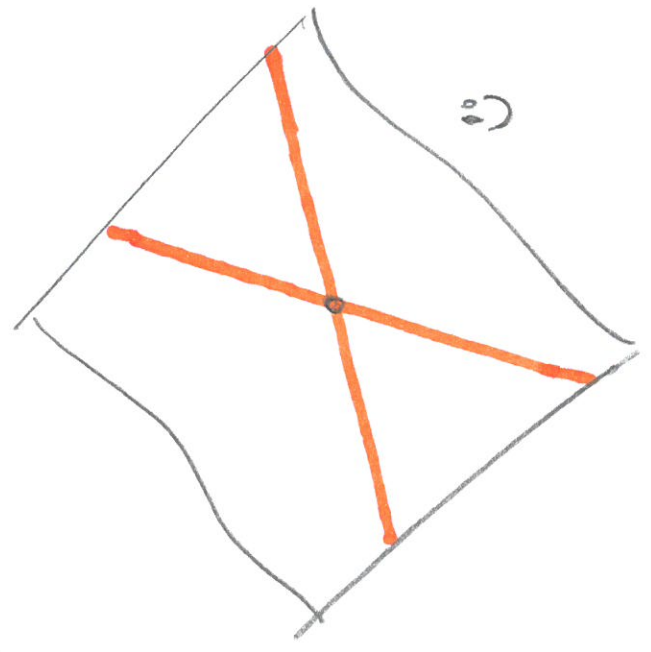
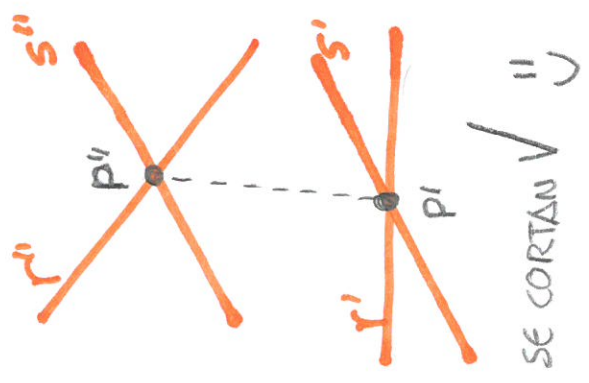
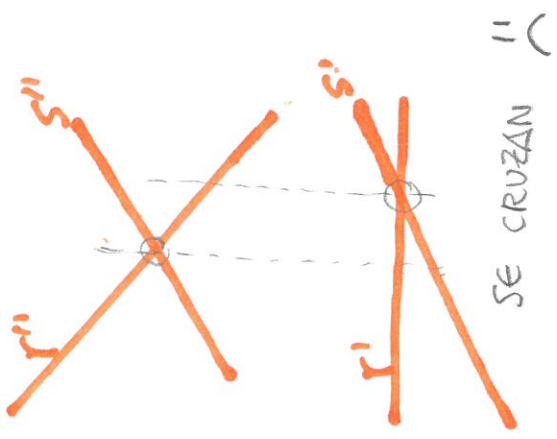
4 INTERSECCIONES DE RECTAS

SE CORTAN EN UN PUNTO.

¿QUÉ PUEDEN HACER?


- CORTAN
 - SON PARALELAS
 - SE CRUZAN
- } Formar un plano

NO SE PUEDE
GENERAR UN
PLANO CON RECTAS
QUE CRUZAN

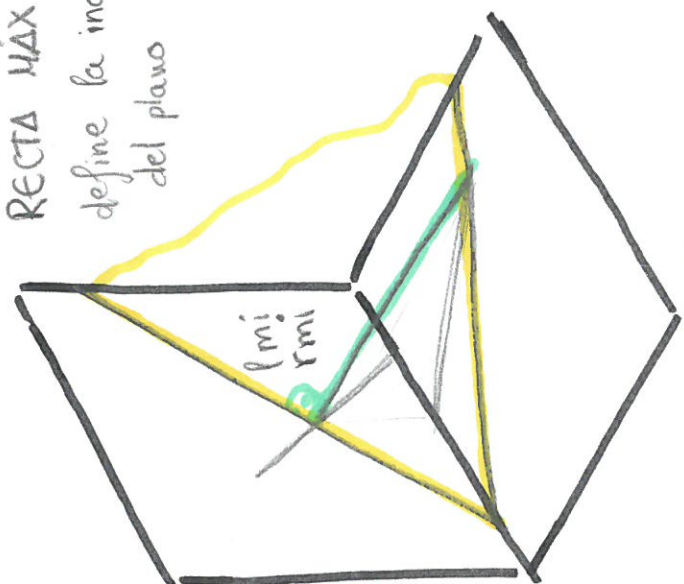
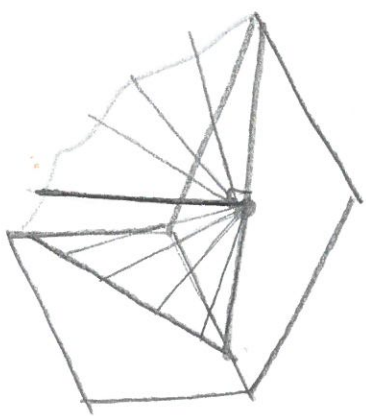


5

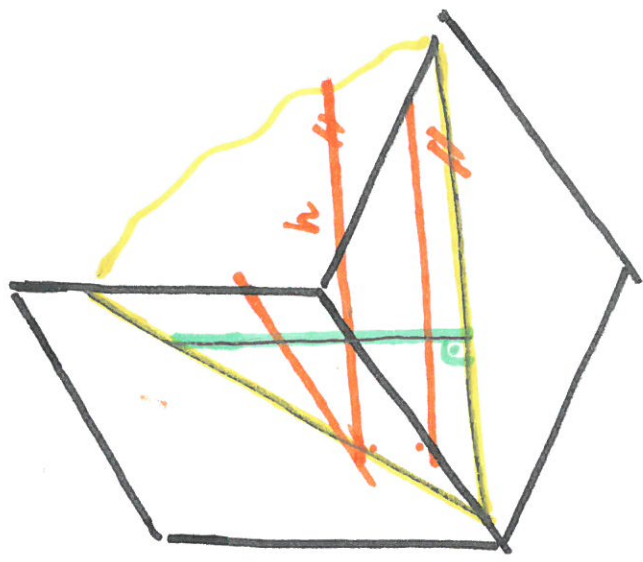
PLANOS

- 3 PUNTOS (NO ALINEADOS)
- DOS RECTAS 
- UNA RECTA + UN PUNTO
- FIGURA PLANA.
- RECTAS "ESPECIALES"

* [MÁXIMA PENDIENTE
MÁXIMA INCLINACIÓN



RECTA MÁX INCLINACIÓN
define la inclinación
del plano

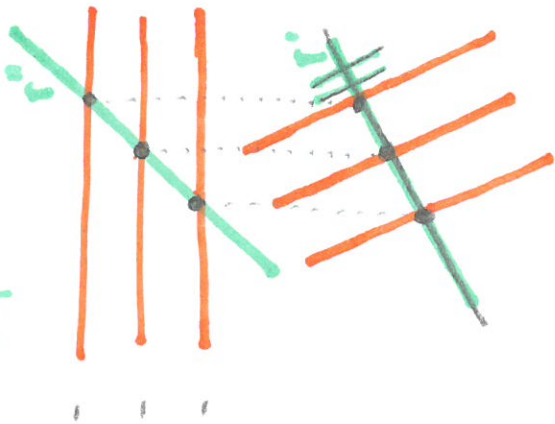


RECTA MAX
PENDIENTE → define la pendiente
del plano

6 RECTAS Y PLANOS

RECTA MAX, PENDIENTE

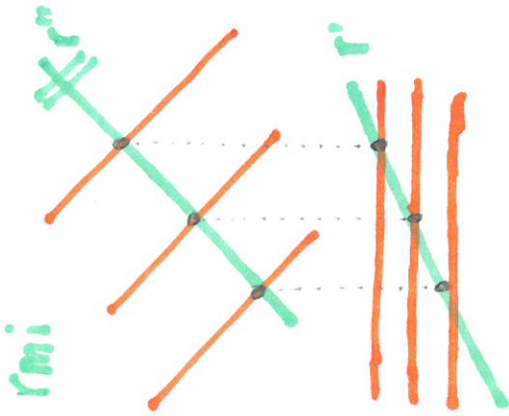
r_{mp}



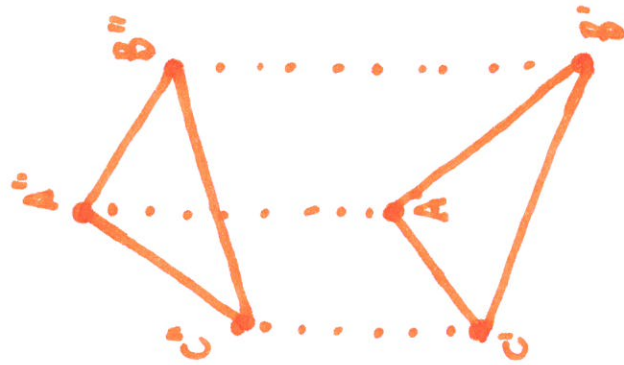
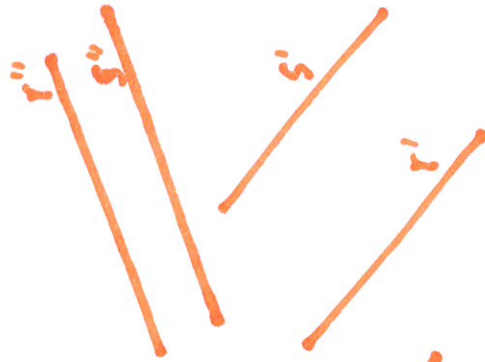
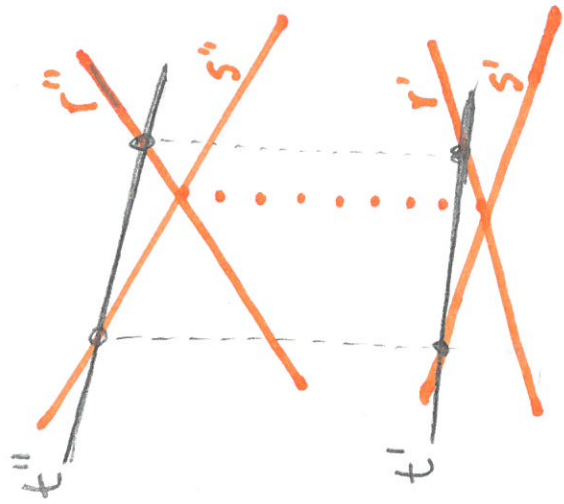
(+ horizontales)

RECTA MÁX INCLIMACIÓN

r_{mi}

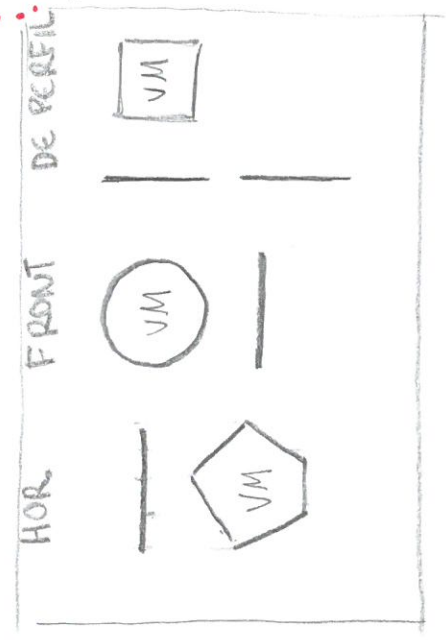
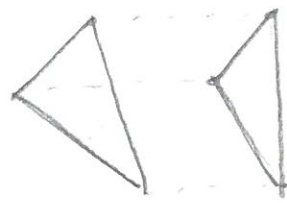
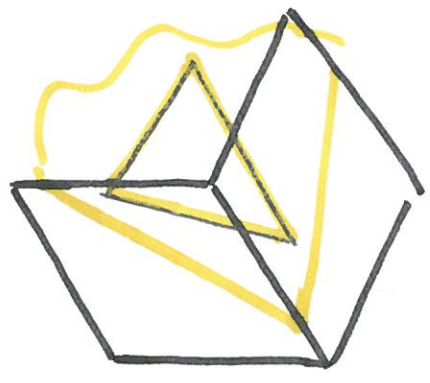


(+ frontales)



7 TIPOS DE PLANOS

(POSICIÓN)



//

HORIZONTAL

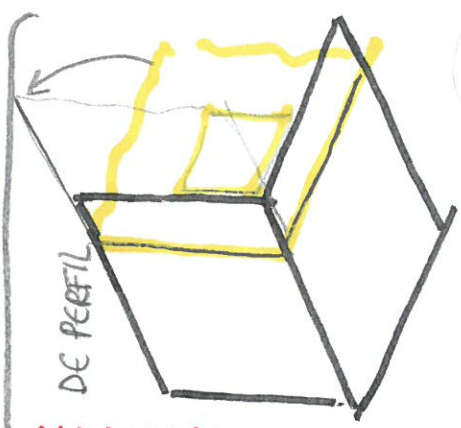
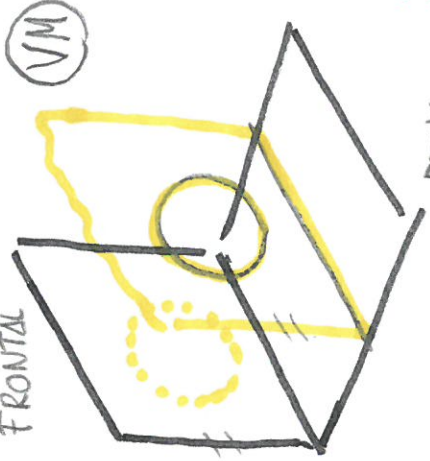
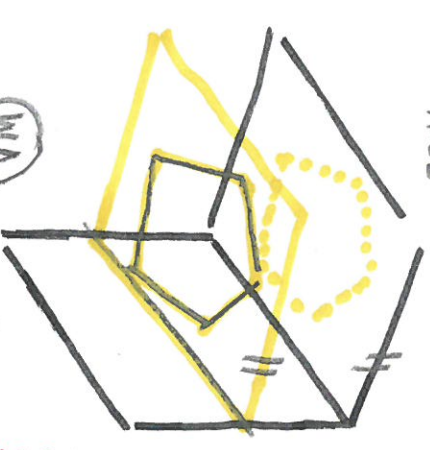
FRONTAL

DE PERFIL

VM

VM

VM en el perfil



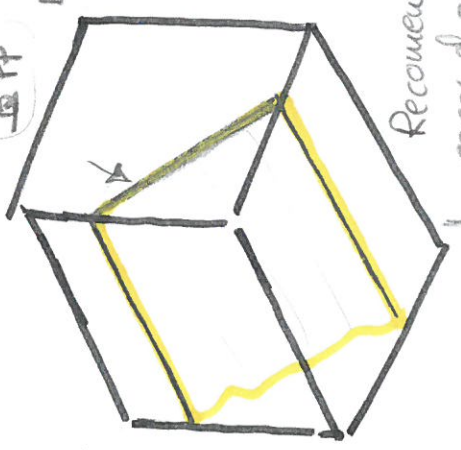
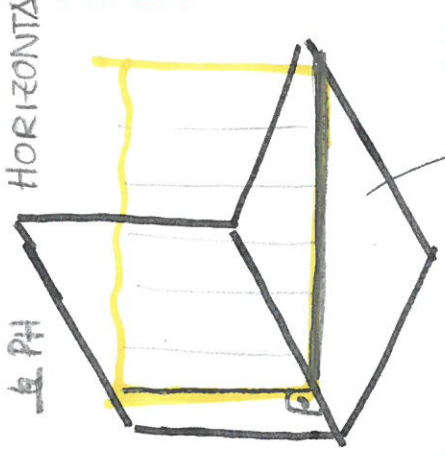
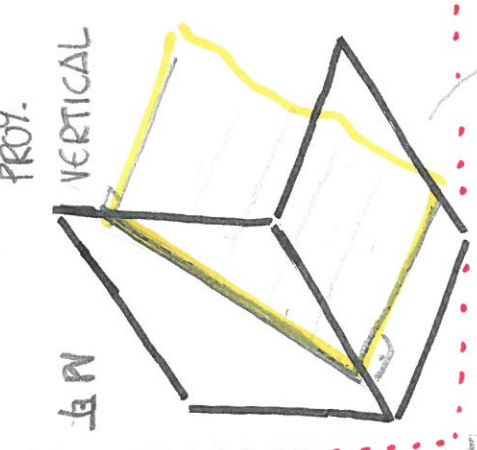
PROY. VERTICAL

PROY. HORIZONTAL

PROY. DE PERFIL

PH

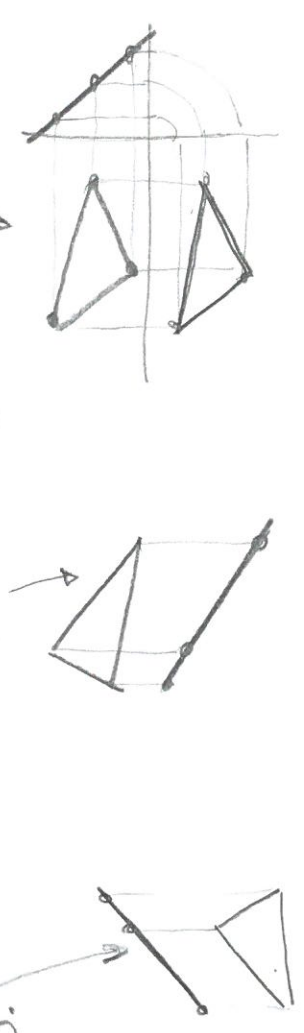
PP



Recomendable sacar el perfil.

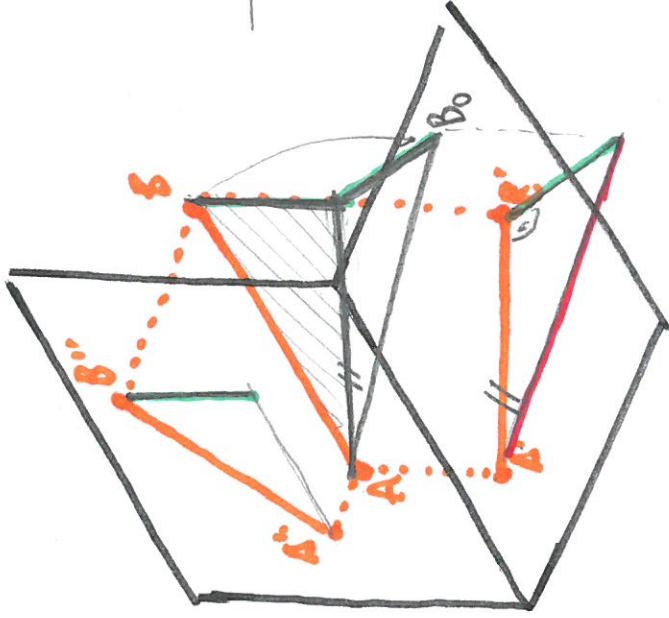
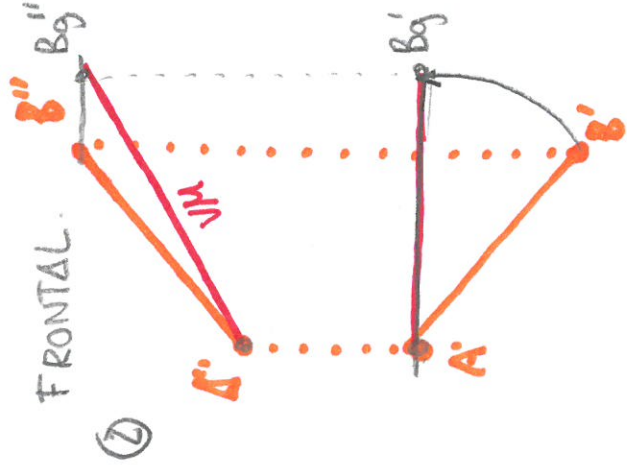
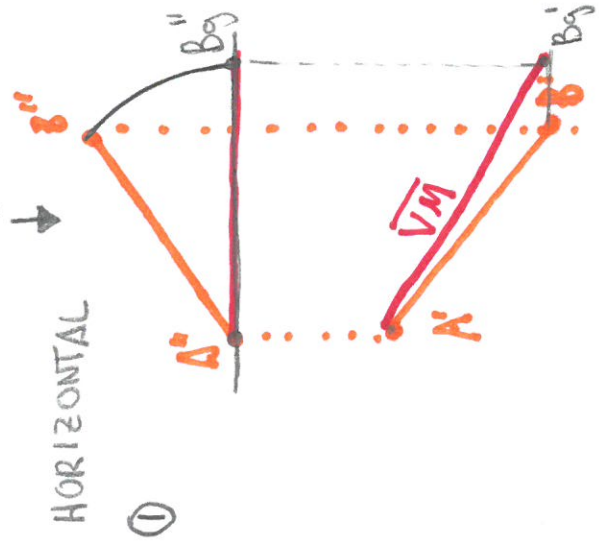
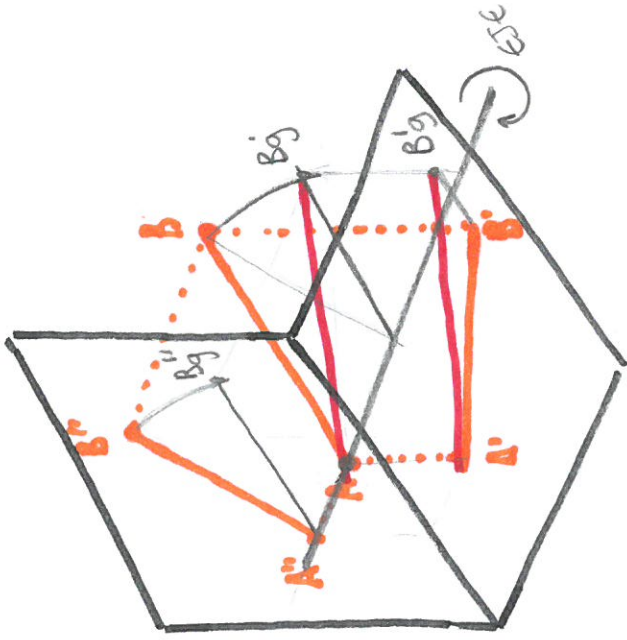
PROYECTANTES.
(DE CANTO)

PERPENDICULARES



⑧ GIROS · DISTANCIAS:

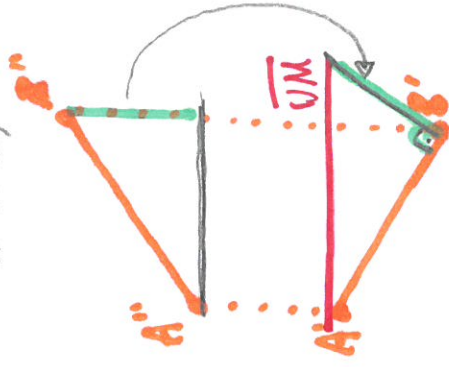
VM → SEGMENTOS



→

③

HORIZONTAL.
(≠ COTA)

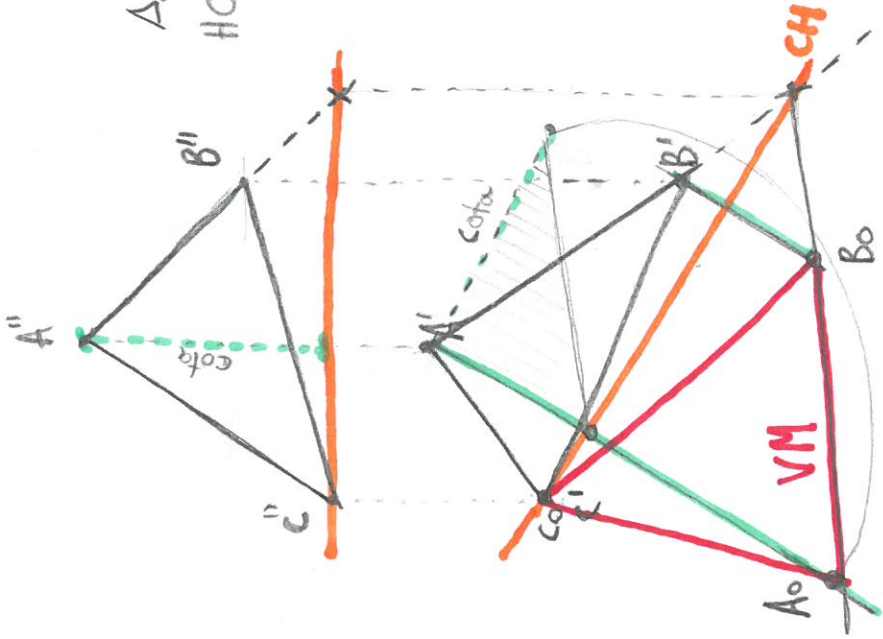
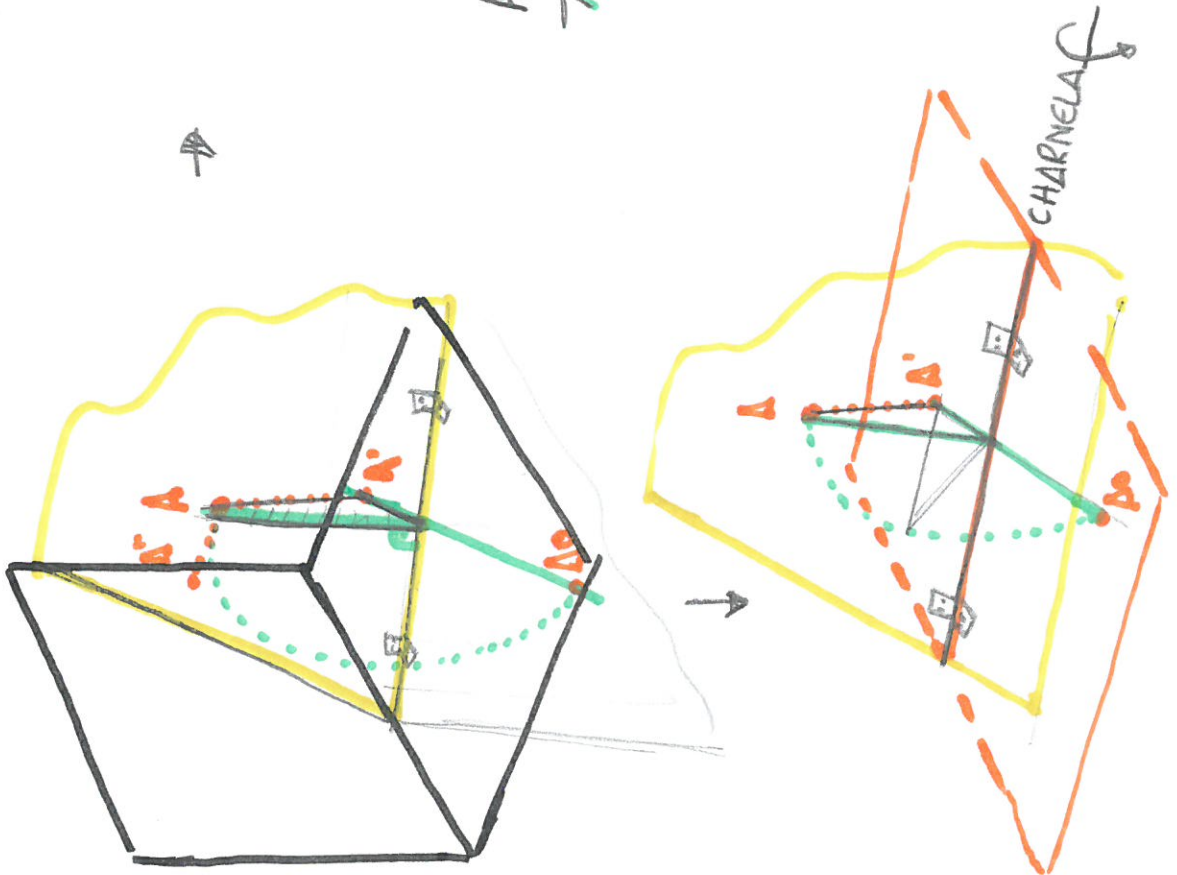


* ≠ COTA

≠ ACEJAMIENTO.

9 ABATIMIENTOS

VM → PLANOS

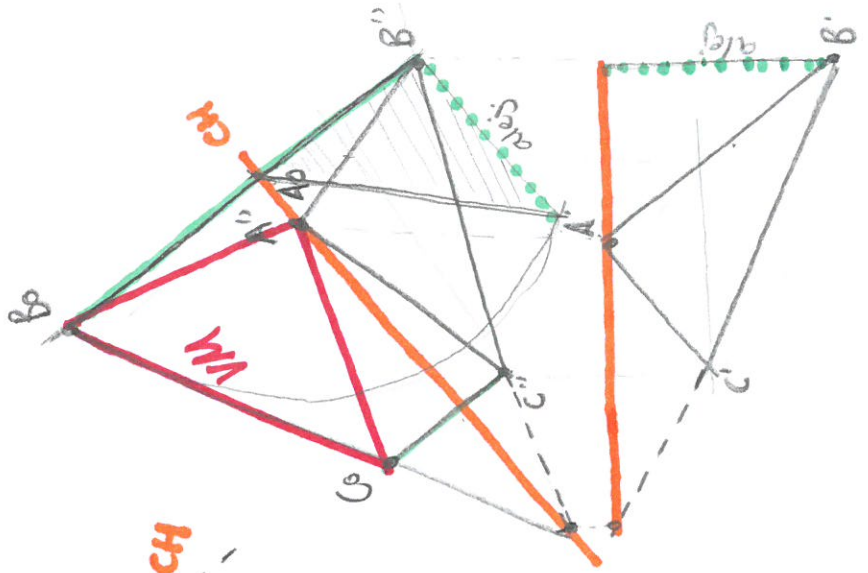


ABATIMIENTO
HORIZONTAL

CHARNELA → r. horizontal
R.M. PENDIENTE

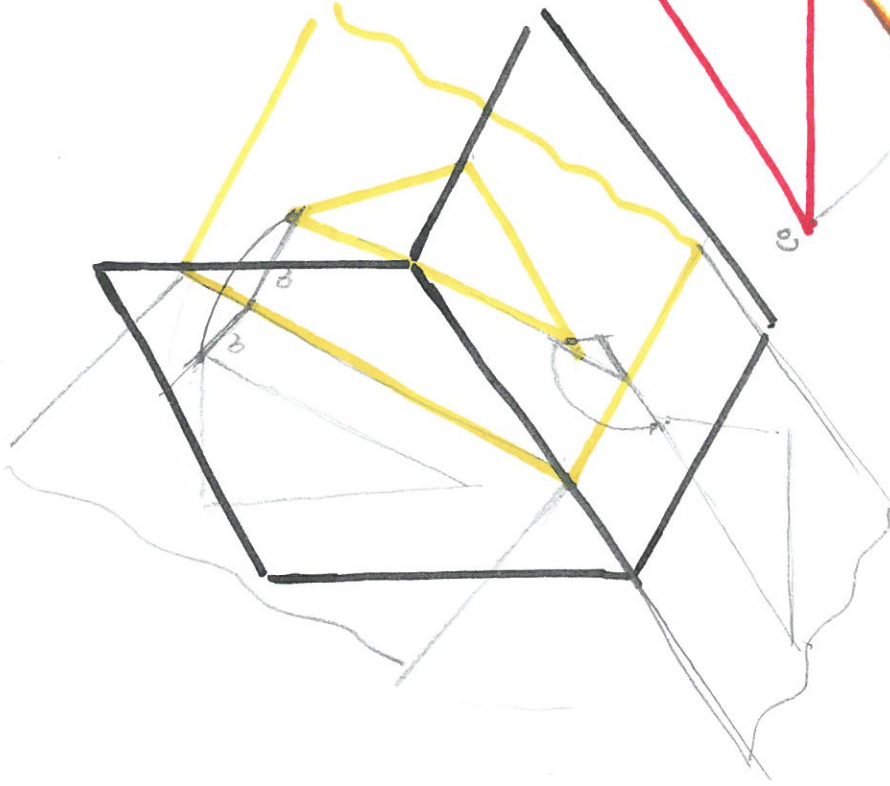
ABATIMIENTO
VERTICAL

CHARNELA → frontal
R.M. INCLINACIÓN



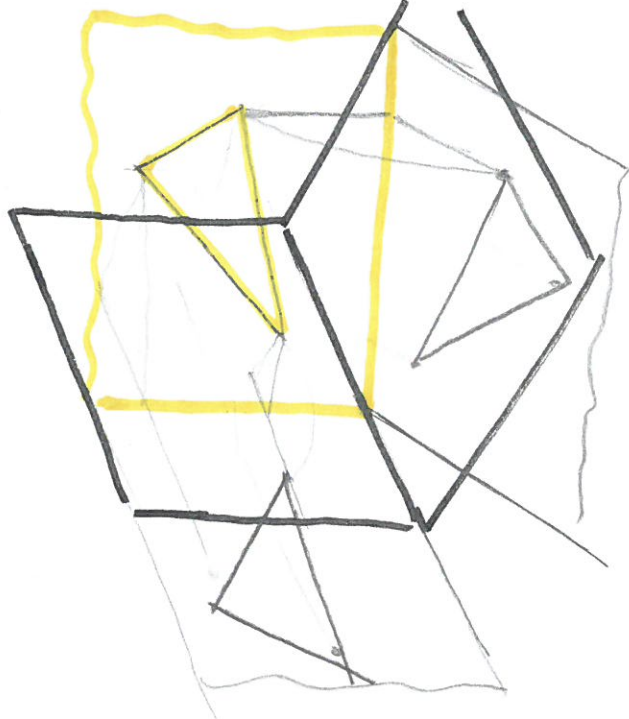
10) ABATIMIENTO

DE PROYECTANTES:



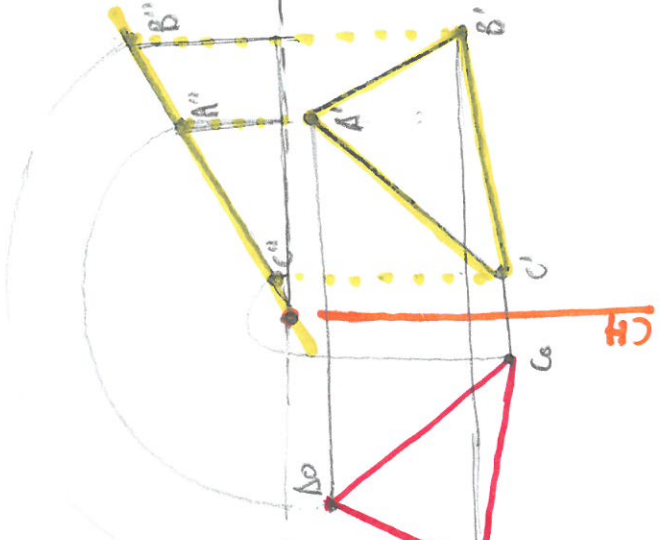
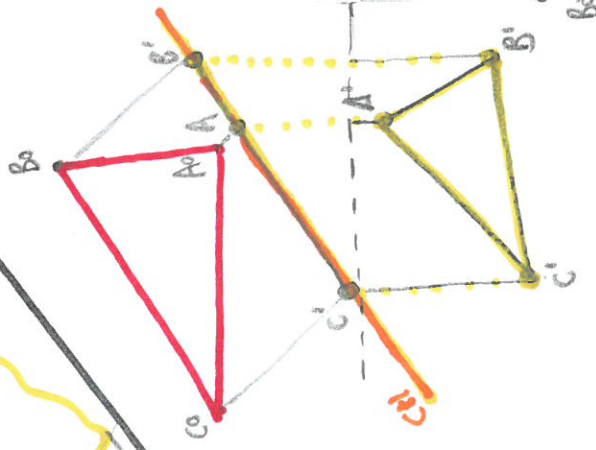
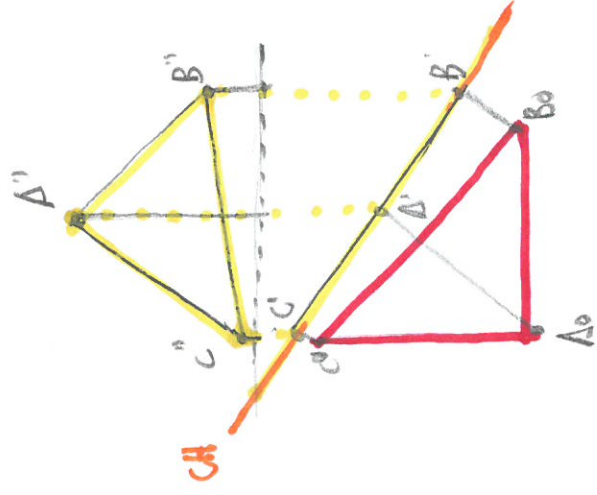
Planos proyectantes
VERTICALES

Abatimiento
VERTICAL



Planos proyectantes
HORIZONTALES

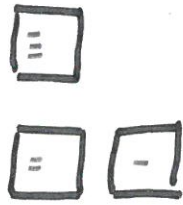
Abatimiento
HORIZONTAL



II) PROYECCIONES

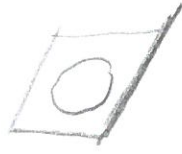
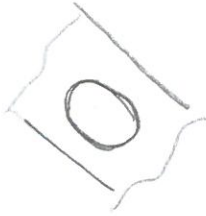
AUXILIARES

(cambio de plano)

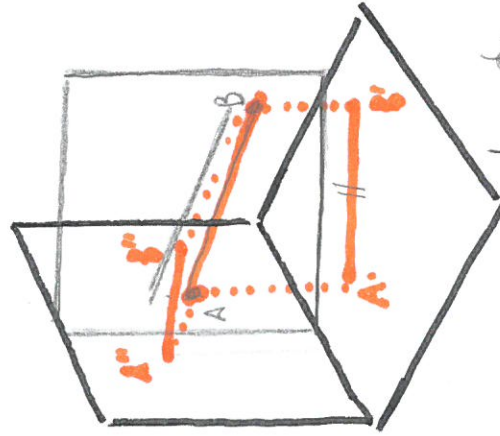


- rectas
- planos
- superficies

* PROY. AUXILIARES para planos:

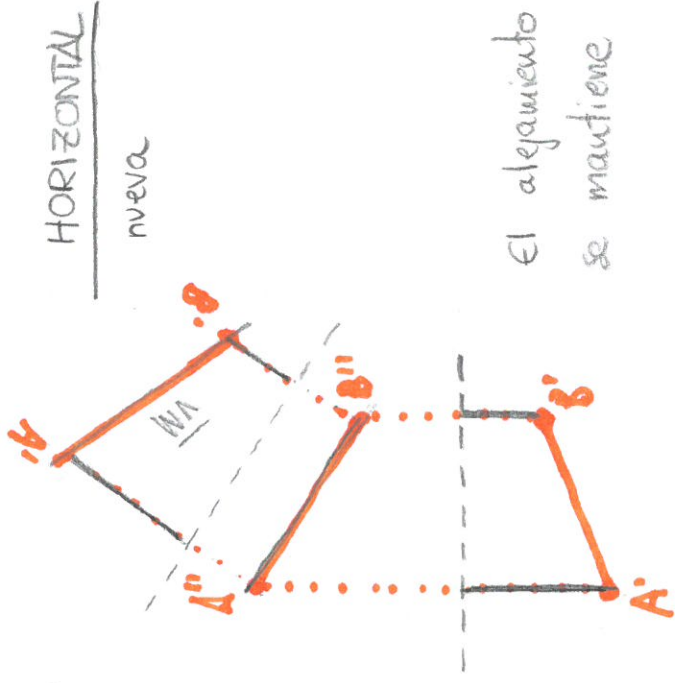


- PROY. AUXILIAR VERTICAL nueva!!



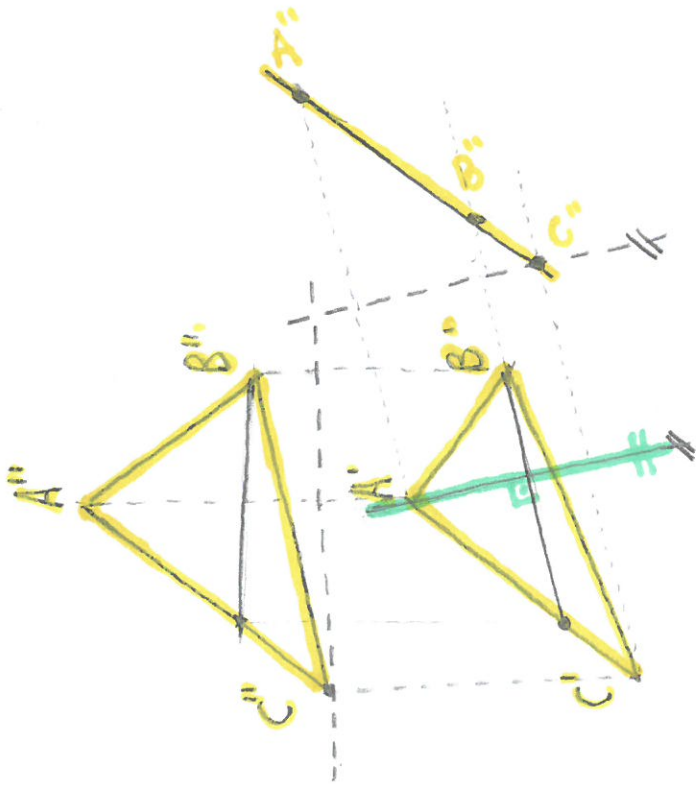
la cota SE MANTIENE

- PROY. AUXILIAR



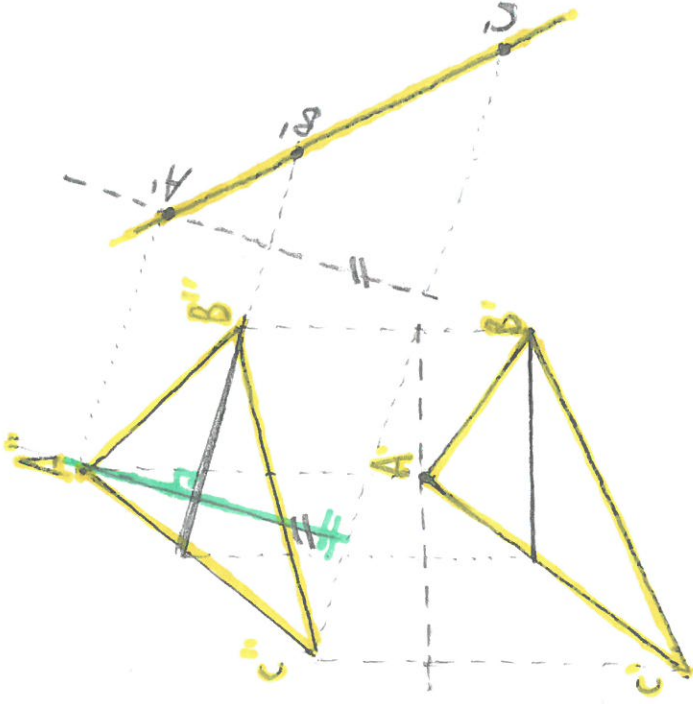
El alejamiento se mantiene

(12) CAMBIOS DE PLANO:



① PLANO OBLICUO \rightarrow proy. vertical

\hookrightarrow RECTA MÁX PENDIENTE
 \parallel línea de referencia.

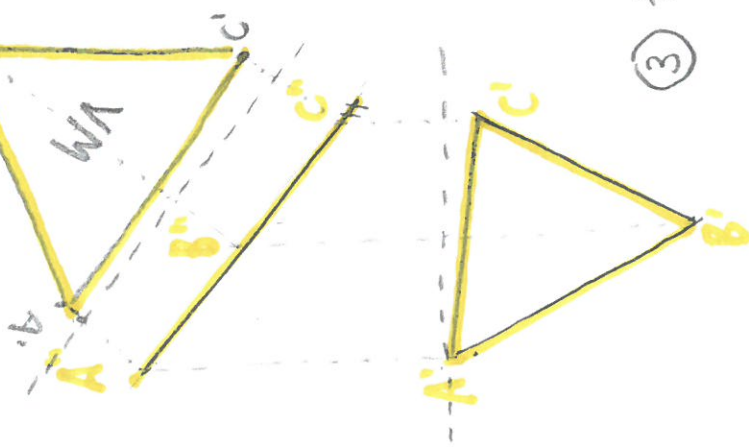


② PLANO OBLICUO \rightarrow proy. horizontal

\hookrightarrow RECTA MÁX INCLINACIÓN
 \perp línea de referencia.

(13) CAMBIOS DE PLANO

+ VM "

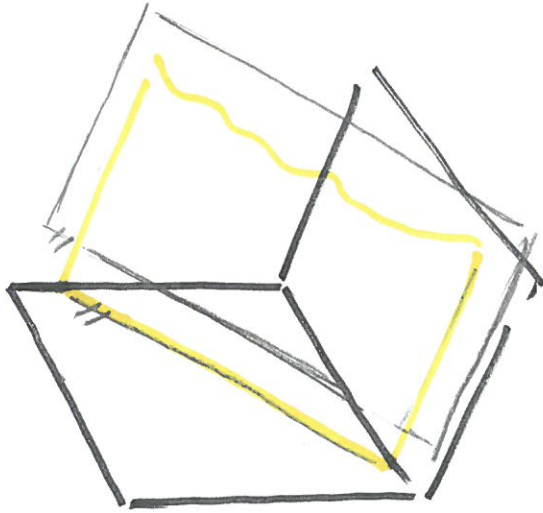


Nos llevamos los ALEJAMIENTOS

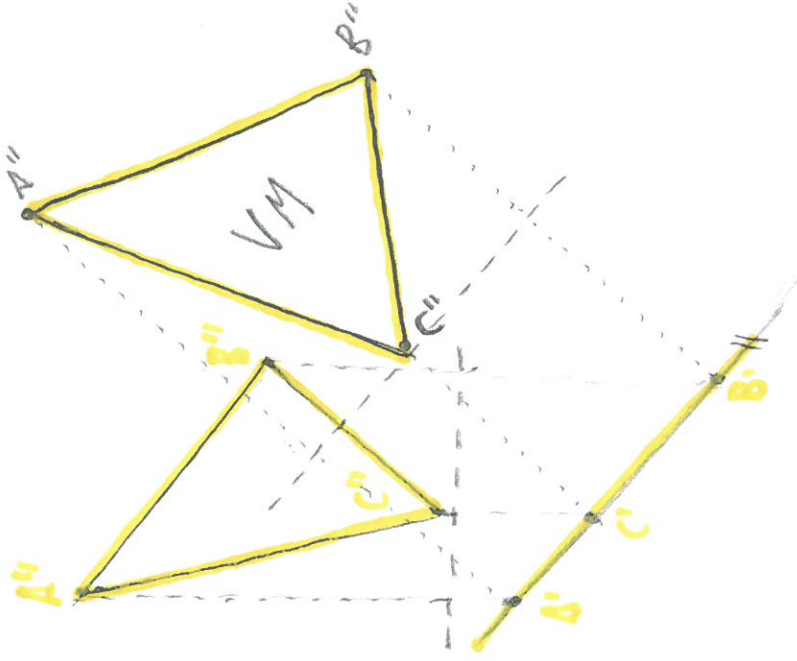
(3) PROY. VERTICAL

HORIZONTAL

(proy. auxiliares horizontal)



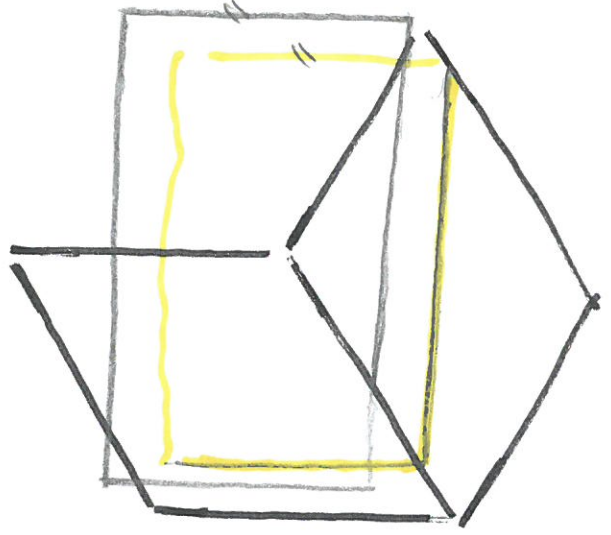
Nos llevamos las COTAS



(4) PROY. HORIZONTAL

FRONTAL

(proy. auxiliar vertical)

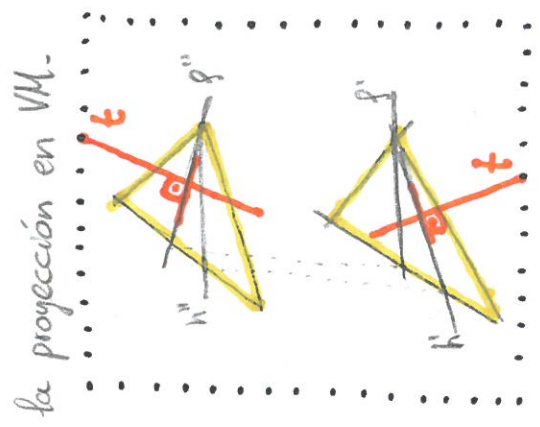
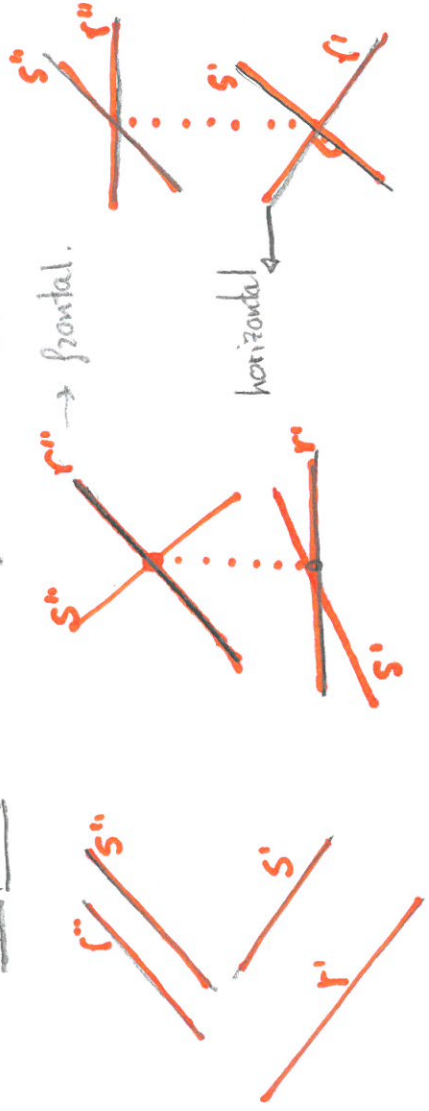


(14) PARALELISMO Y PERPENDICULARIDAD.

RECTAS

→ // SI

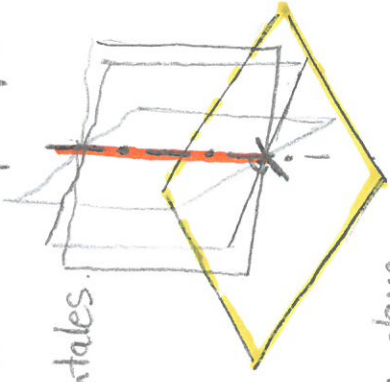
→ \perp NO → Si hay horizontales / frontales se verá \perp en la proyección en VM.



PLANOS

→ // SI

→ aunque lo que "veremos" paralelo seran sus rectas principales:
RMP + horizontales - RMI + frontales.



→ \perp NO → Sabemos que un plano es perpendicular a otro si contiene una recta \perp

RECTA + PLANO

→ // NO

→ Para que una recta sea // a un plano tiene que ser // a una recta de ese plano.

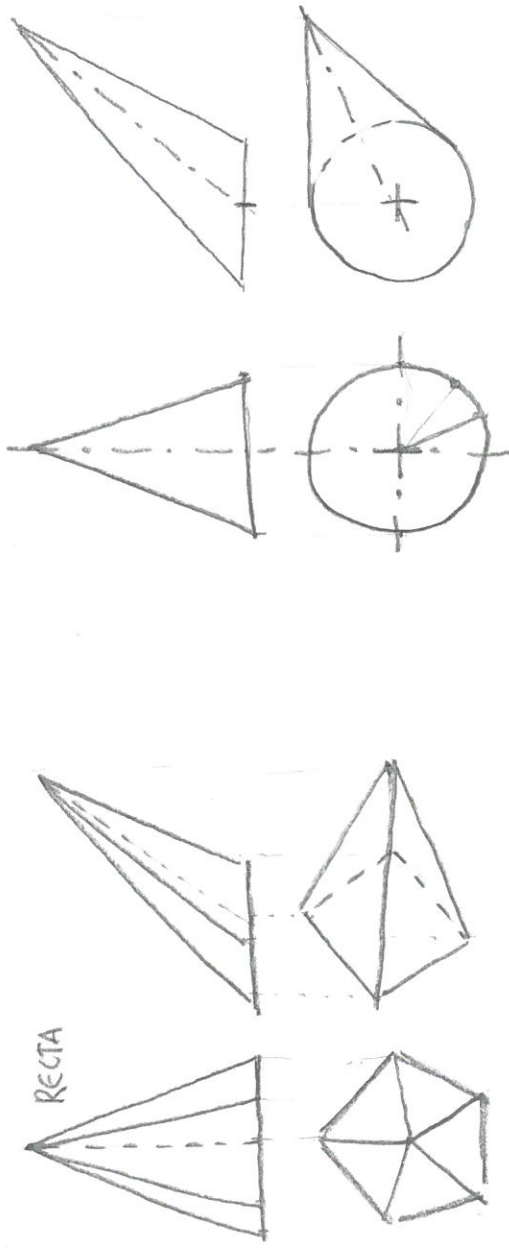
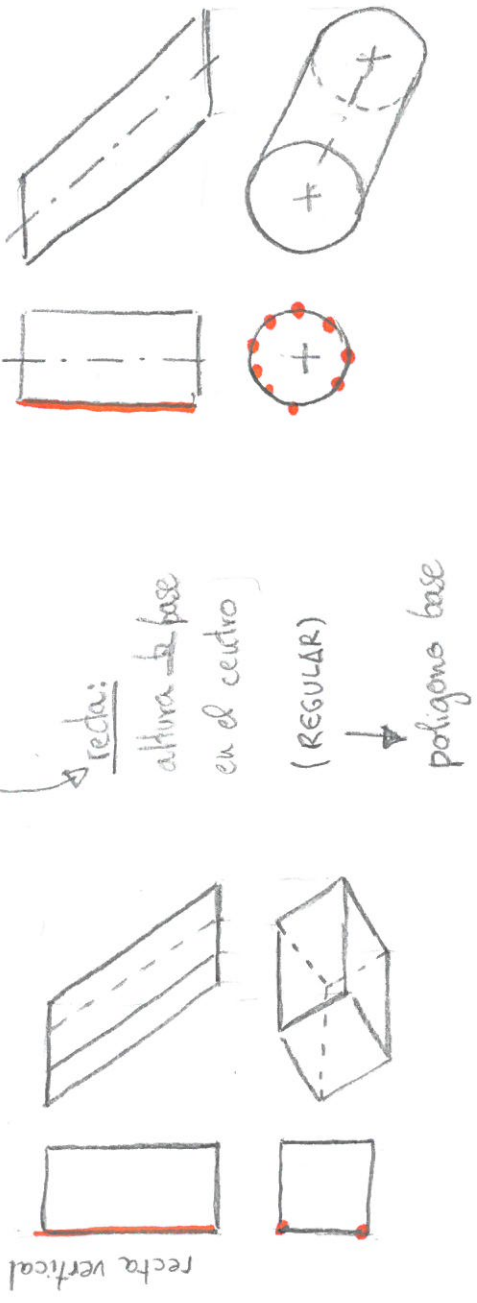
\perp SI

→

→ la proyección vertical de la recta \perp a la frontal del plano
la proy. horizontal de la recta \perp a la horizontal del plano


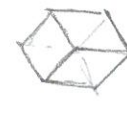



15 SUPERFICIES REGLADAS:

PRISMAS + PIRÁMIDES + CONOS + CILINDROS.



POLIEDROS

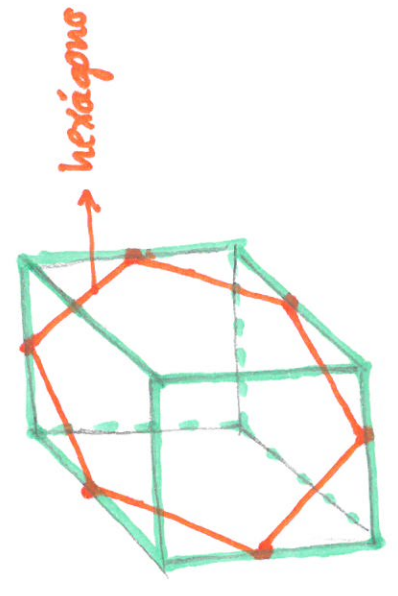
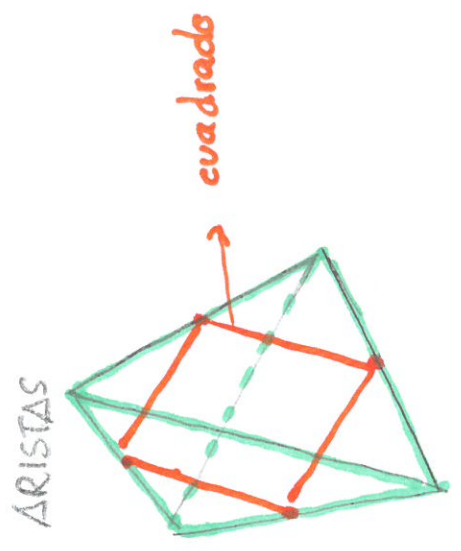
SÓLIDOS PLATÓNICOS

- TETRAEDRO (4) Δ 
- HEXAEDRO / CUBO (6) \square 
- OCTAEDRO (8) Δ 
- DODECAEDRO (12) 
- ICOSAEDRO (20) Δ 

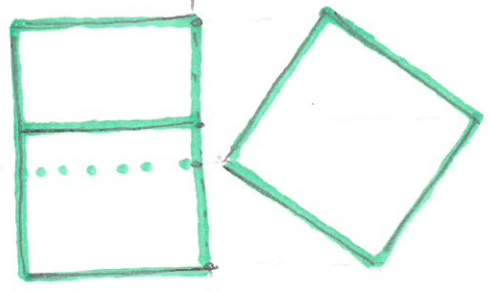
(16) POLIEDROS I

SECCIÓN PRINCIPAL

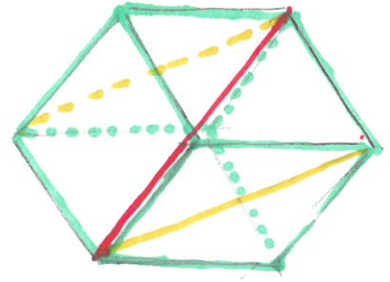
→ Puntos medios de las



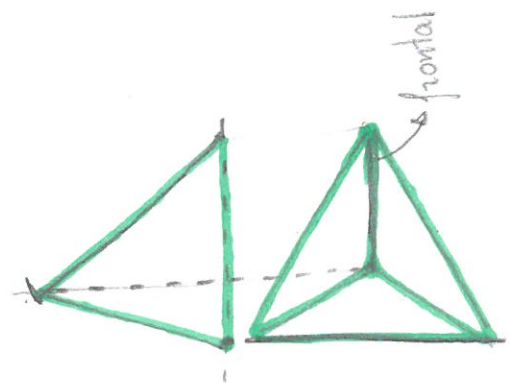
- CUBO -



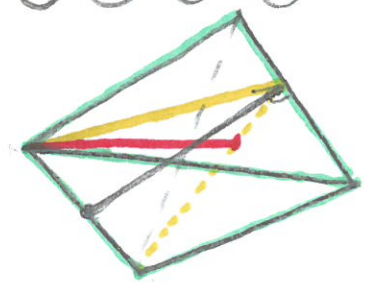
- ① ARISTA
- ② DIAGONAL CARA
- ③ DIAGONAL CUBO



- TETRAEDRO -

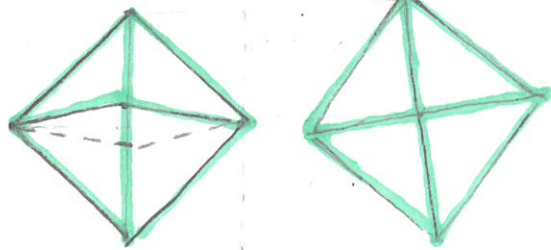


- ① ARISTA
- ② ALTURA CARA
- ③ ALTURA TETRAEDRO
- ④ MÍNIMA DISTANCIA ENTRE ARISTAS OPUESTAS

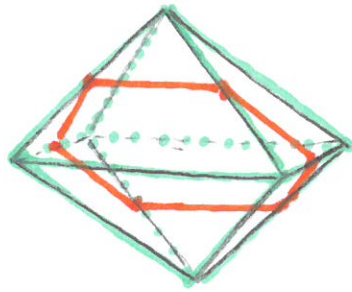


(17) POLIEDROS 2

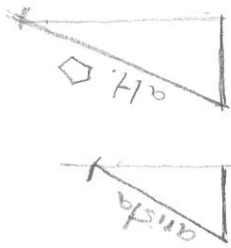
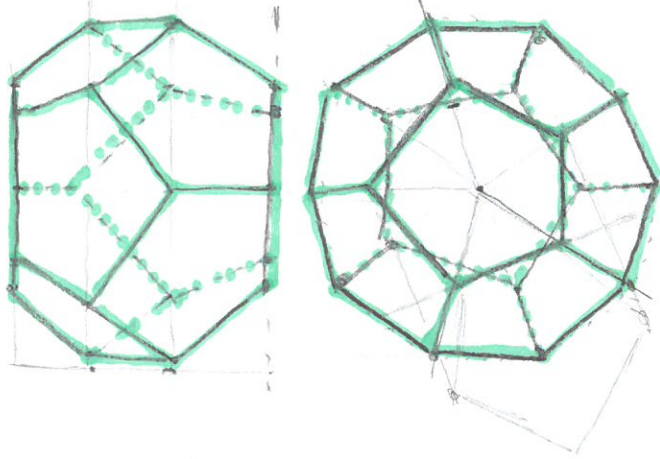
- OCTAEDRO -



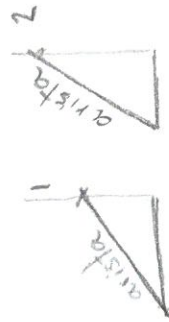
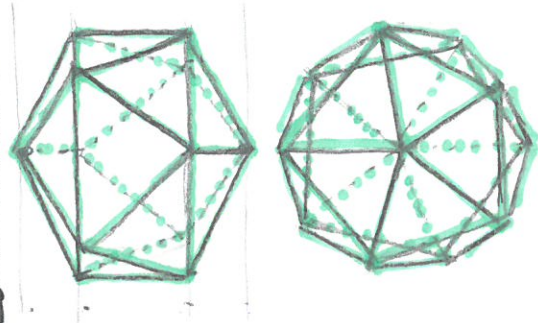
SECCIÓN PRINCIPAL



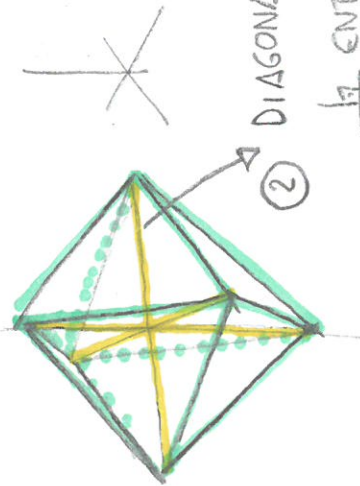
- DODECAEDRO



- ICOSAEDRO



① ARISTA



② DIAGONALES

ENTRE SI

18) CONSTRUCCIONES SOBRE PLANO

1) BASE SOBRE PLANO → Abatir (VM)

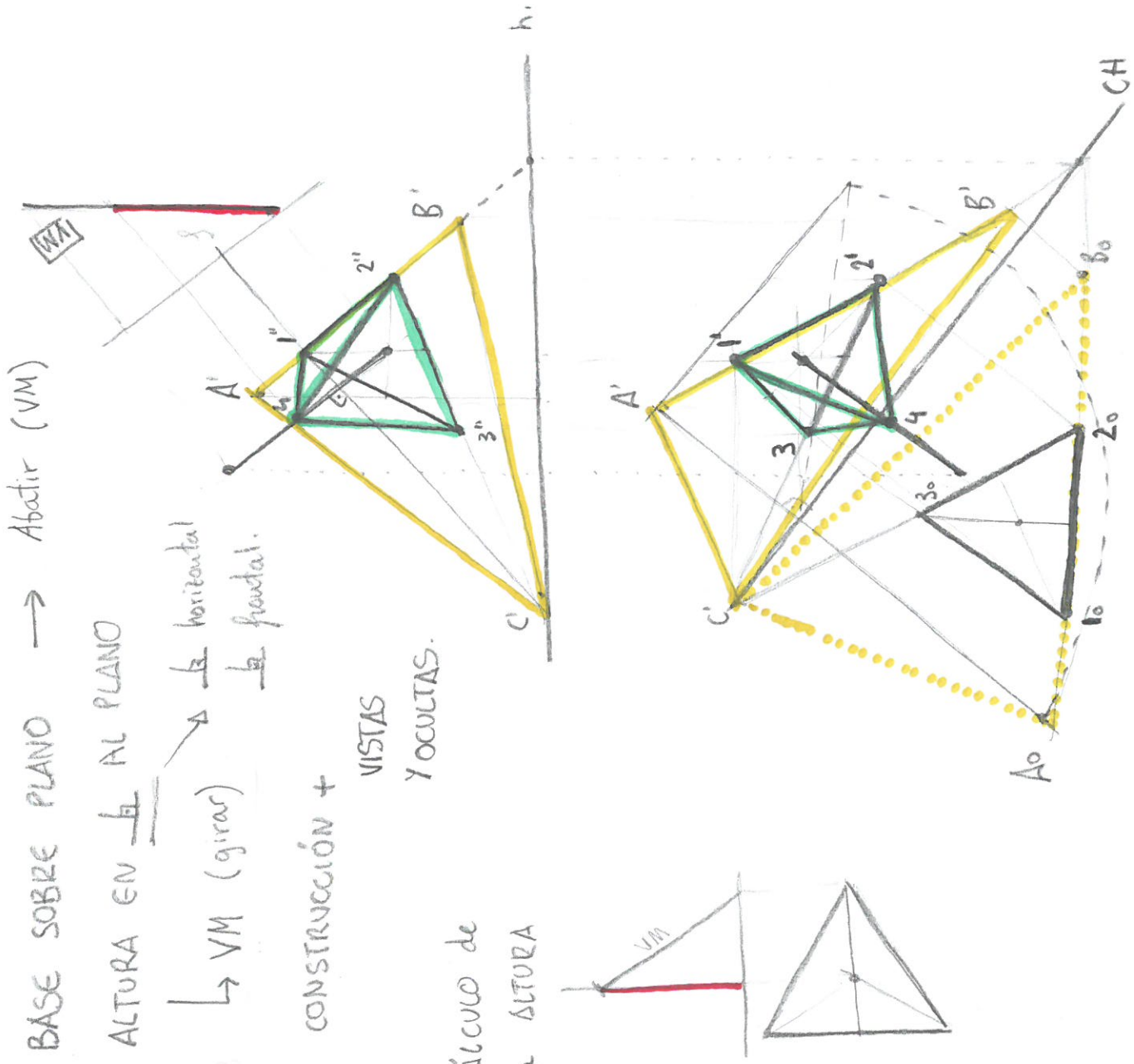
2) ALTURA EN h AL PLANO

↳ VM (gírar) → h horizontal
h frontal.

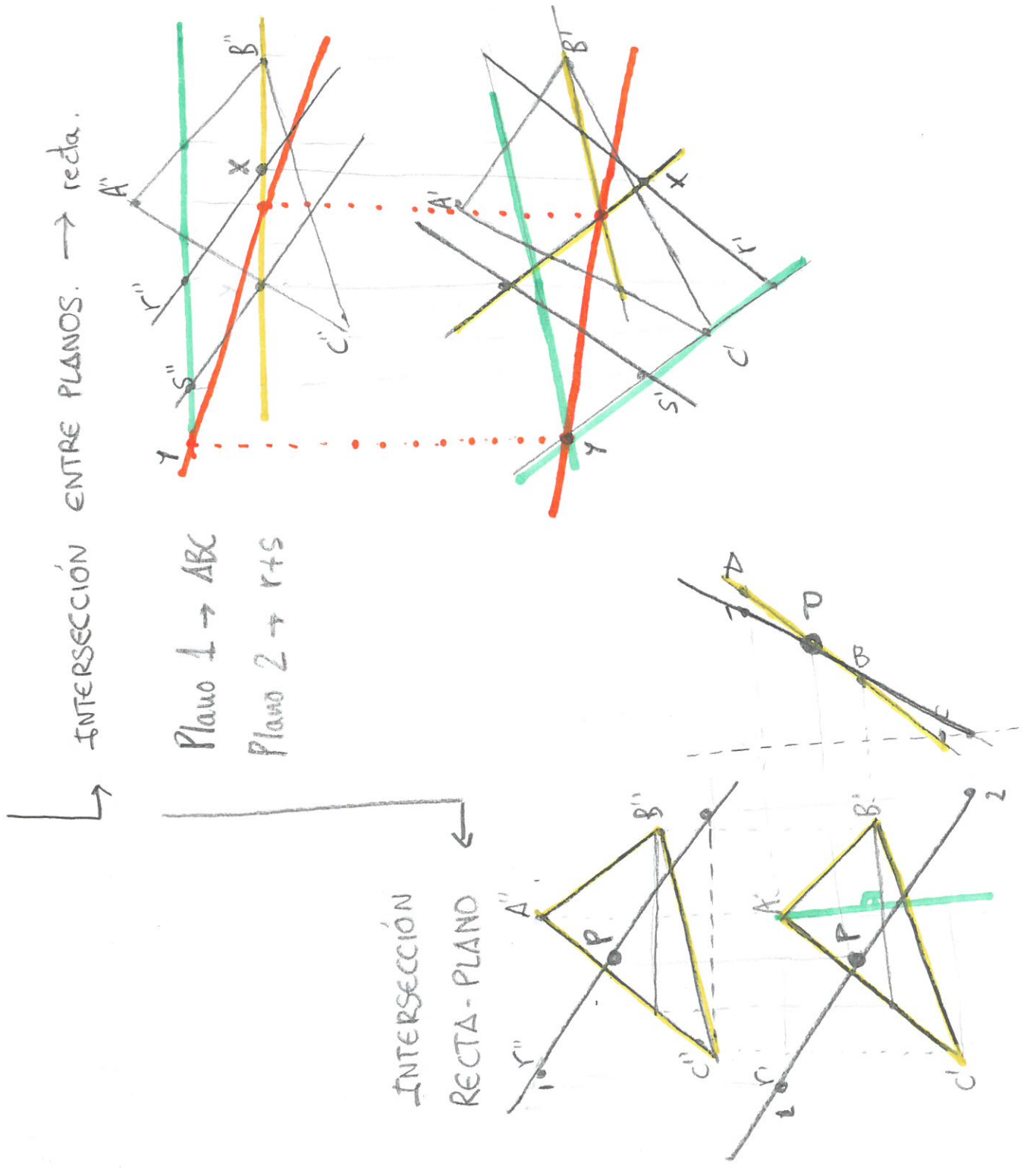
3) CONSTRUCCIÓN +

VISTAS
 Y OCULTAS.

CÁLCULO de
 la ALTURA



19 SECCIONES E INTERSECCIONES:



INTERSECCIÓN ENTRE PLANOS. → recta.

Plano 1 → ABC
Plano 2 → rts

① plano horizontal
↳ CORTE P1 } X
CORTE P2 } X

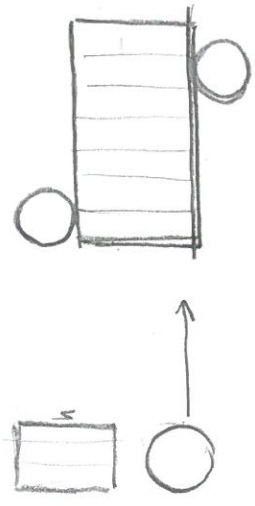
② plano hor.
CORTE P1 } Y
CORTE P2 } Y

③ X+Y
recta de intersección

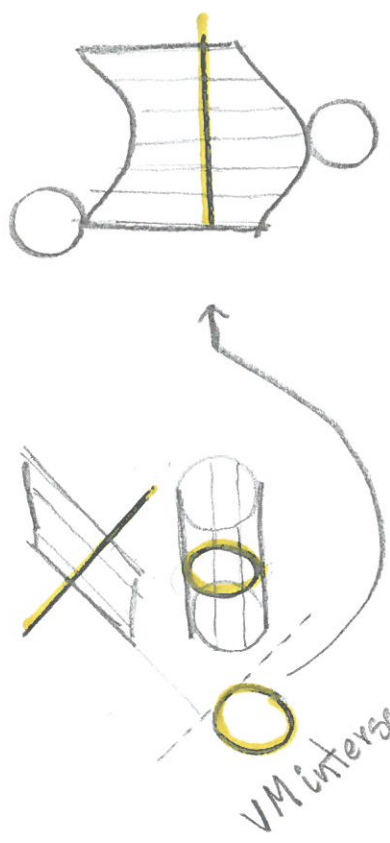
INTERSECCIÓN
RECTA-PLANO

20 SECCIONES + DESARROLLOS

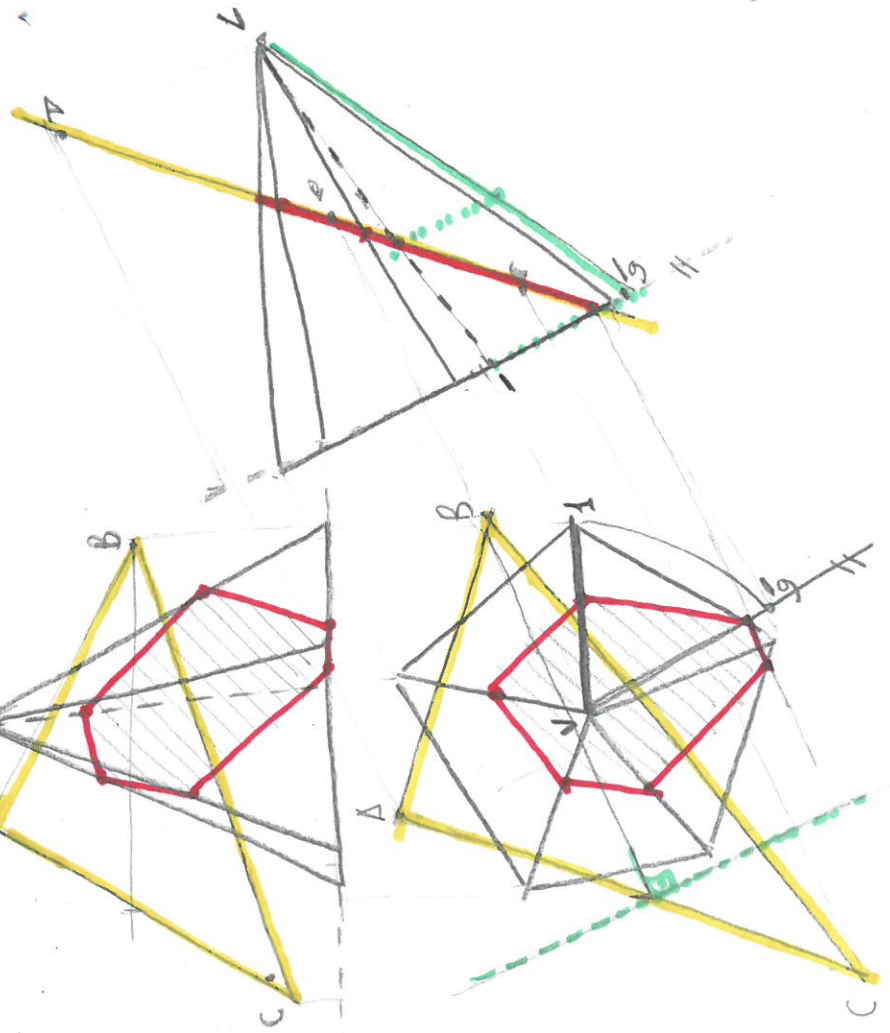
- PRISMAS / CILINDROS RECTOS



- PRISMAS / CILINDROS OBLICUOS

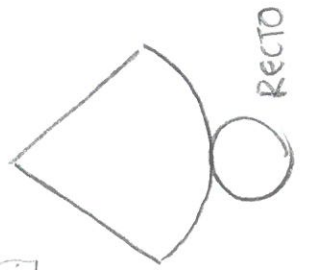
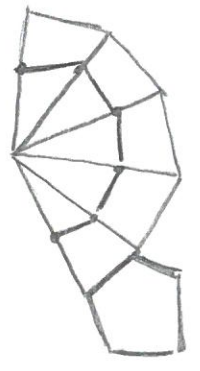


posición FRONTAL de la figura
plano de corte sea proyectante

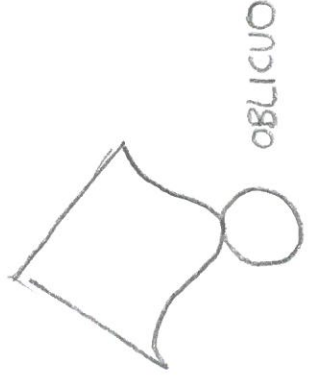


- PIRÁMIDES Y CONOS.

→ Buscar VM aristas → GIROS



RECTO

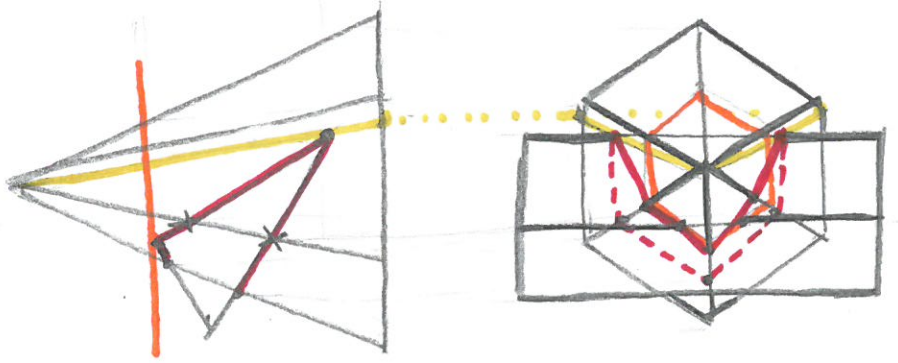
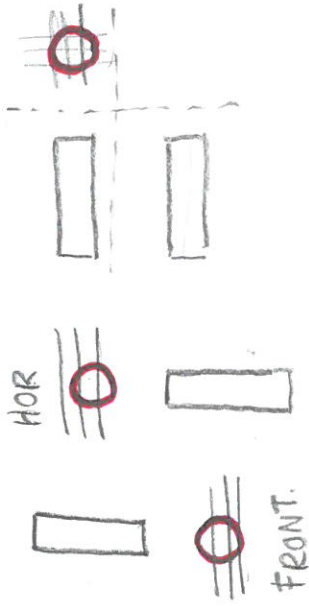


OBLICUO

VM intersección

21) INTERSECCIONES ENTRE FIGURAS:

* POSICIONES
PREFERENTES

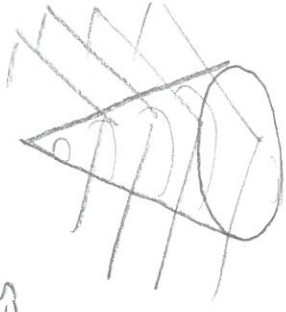


PROYECCIÓN AUXILIAR

para llegar a las posiciones
preferentes.

CORTAR CON PLANOS

- HORIZONTALES
- FRONTALES



GENERATRICES
ó ARISTAS FICTICIAS

(por los puntos de
intersección)

