

HOJA  
1

26 de JUNIO 2020

TEMA

DIAGRAMAS 3D

TP6

TRABAJO PRÁCTICO Nº6

DIAGRAMAS  
3D

CURSO 4 – CARNICER – PARENTE

F.I.U.B.A.  
D.T.O. ESTABILIDAD  
84.02 /64.11  
ESTABILIDAD 1

PRIMER CUAT. 2020  
MODALIDAD ONLINE



1 CUAT. 2020

CURSO 4  
PARENTE



[www.ingenieria.uba.ar](http://www.ingenieria.uba.ar)

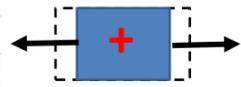


## Solicitaciones

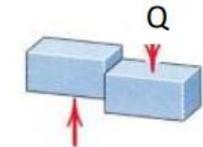
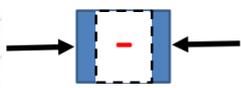
TEMA

TP6

DIAGRAMAS  
3D

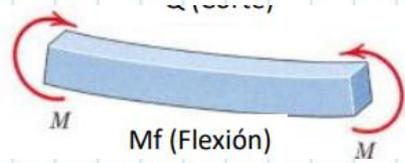


ESFUERZO AXIL



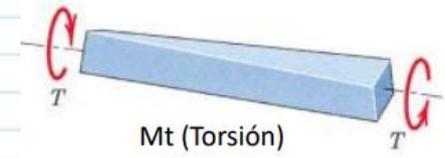
CORTE  
EN DOS DIRECCIONES

Q (Corte)



MOMENTO  
EN DOS DIRECCIONES

Mf (Flexión)



MOMENTO  
TORSOR

Mt (Torsión)

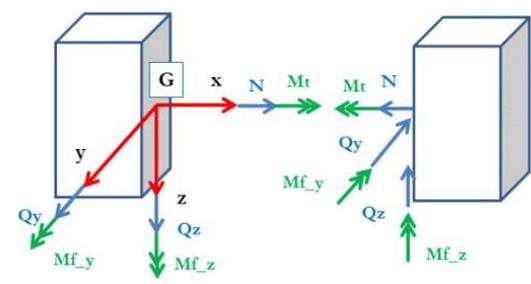
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ESTABILIDAD 1

Solicitaciones en el espacio: 6  
Terna local derecha.  
Cara positiva: izquierda.

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Cara positiva  
(o cara izquierda de la sección de análisis)

Cara derecha

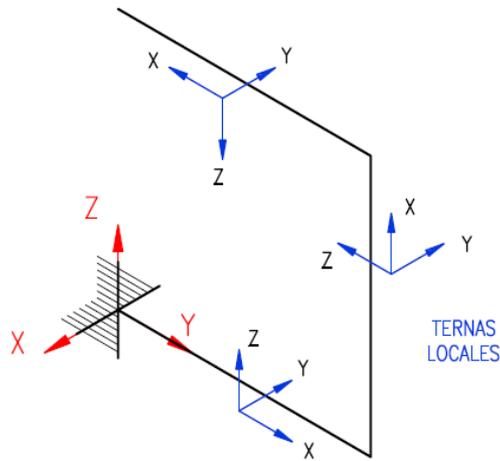
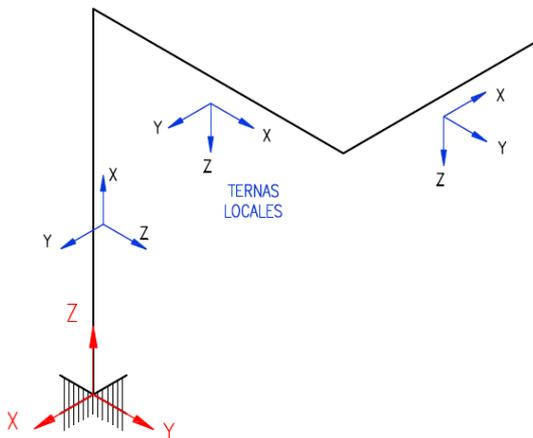
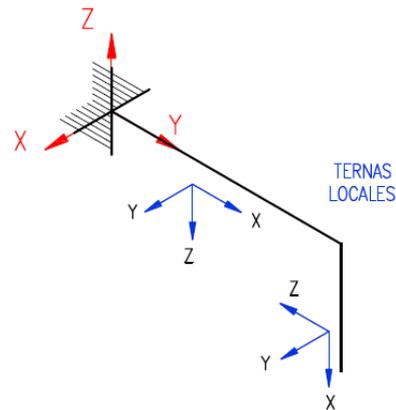
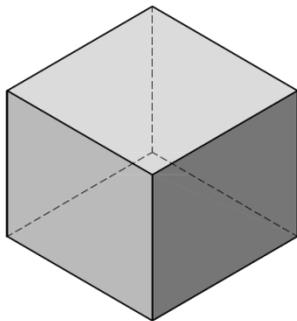


## Ternas globales y locales

TEMA

TP6

DIAGRAMAS  
3D



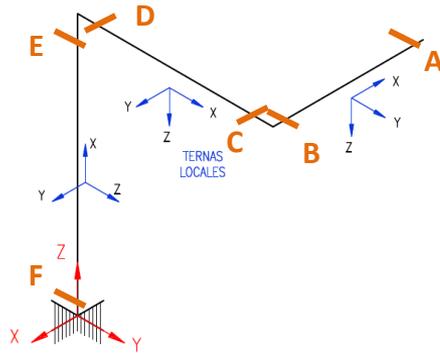
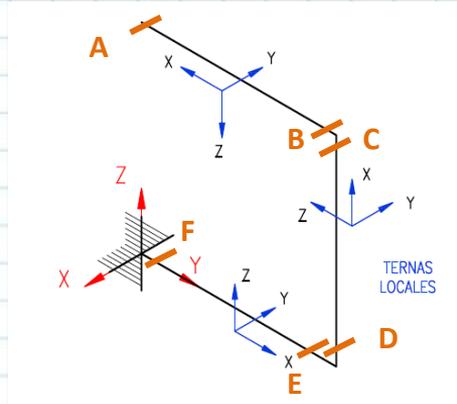
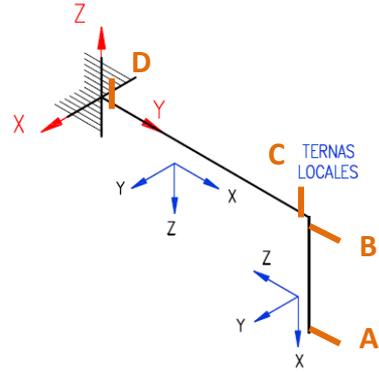
# Estructuras espaciales

Una metodología de trabajo, armado de tabla de solicitaciones.

TEMA

TP6

DIAGRAMAS  
3D



P	Nx	Qy	Qz	Mx	My	Mz
A						
B						
C						
D						
E						
F						

TODOS LOS ESFUERZOS REFERIDOS A LAS TERNAS LOCALES DE REFERENCIA.  
CALCULOS DE RESULTANTES A DERECHA COMPARADAS EN LA TERNA  
CORRESPONDIENTE.

LA CANTIDAD DE PUNTOS A ELEGIR DEPENDE DEL PROBLEMA: GEOMETRIA  
Y CARGAS, Y DEL CONOCIMIENTO DE LAS VARIACIONES DE LAS  
SOLICITACIONES.

## Representación

TEMA

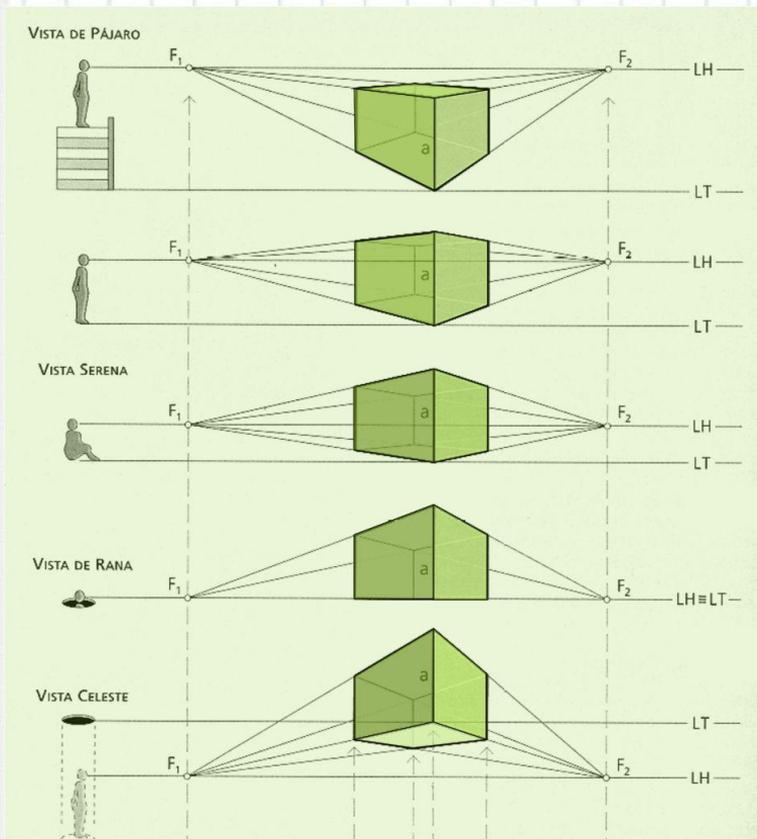
TP6

DIAGRAMAS  
3D

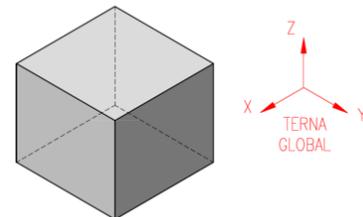
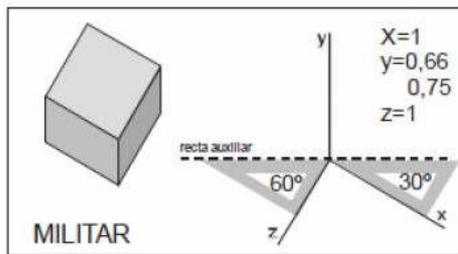
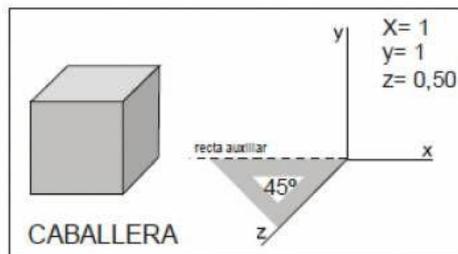
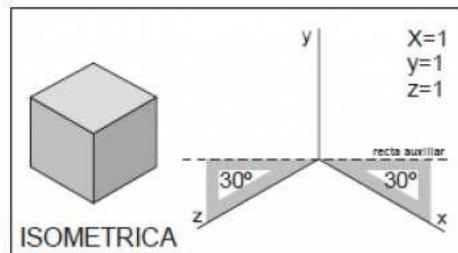
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### Trazado de los Ejes y Porcentajes de Reducción



# Estructuras espaciales

## Representación y Relaciones Diferenciales.

TEMA

TP6

DIAGRAMAS  
3D

NORMAL  
 $N_x$   
PLANO XZ  
Z+

CARGAS

$$\frac{\partial N_x(x)}{\partial x} = -q_x(x)$$

CORTE Y  
 $Q_y$   
PLANO XY  
Y+

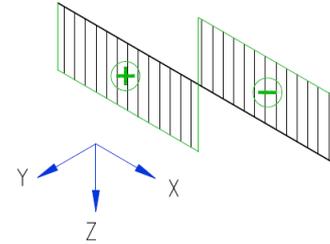
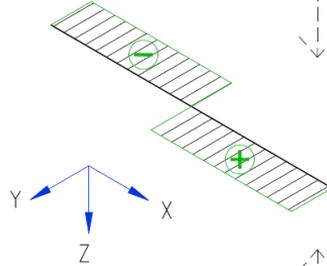
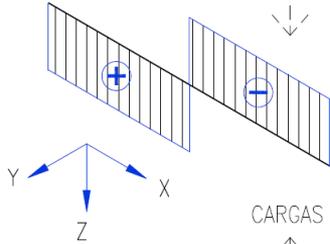
CARGAS

$$\frac{\partial Q_y(x)}{\partial x} = -q_y(x)$$

CORTE Z  
 $Q_z$   
PLANO XZ  
Z+

CARGAS

$$\frac{\partial Q_z(x)}{\partial x} = -q_z(x)$$



TORSOR  
 $M_x$   
PLANO XZ  
Z+

CARGAS

$$\frac{\partial M_x(x)}{\partial x} = -m_x(x)$$

MOMENTO Z  
 $M_z$   
PLANO XY  
Y+

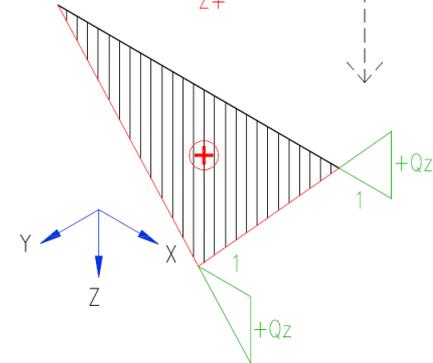
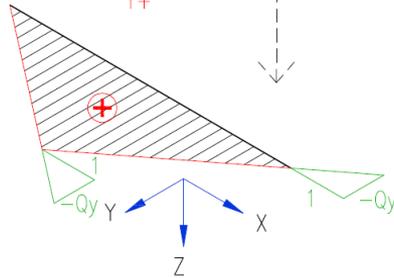
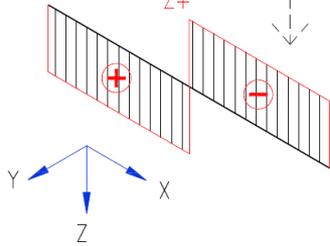
CARGAS

$$\frac{\partial M_z(x)}{\partial x} = -Q_y(x)$$

MOMENTO Y  
 $M_y$   
PLANO XZ  
Z+

CARGAS

$$\frac{\partial M_y(x)}{\partial x} = +Q_z(x)$$



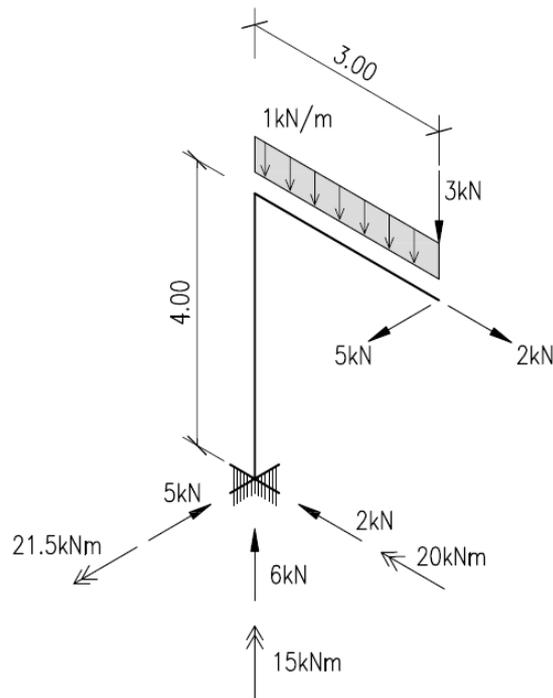
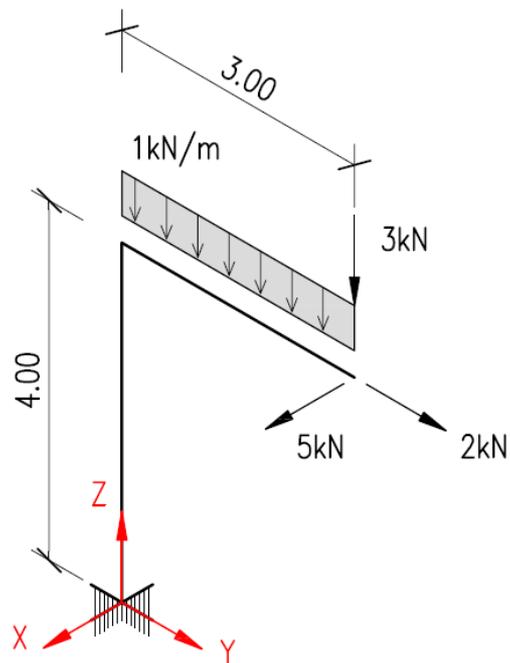
## Ejercicio

Dada la siguiente estructura espacial realizar:

- Análisis cinemático
- RVE
- Diagramas de características

## TEMA

## TP6

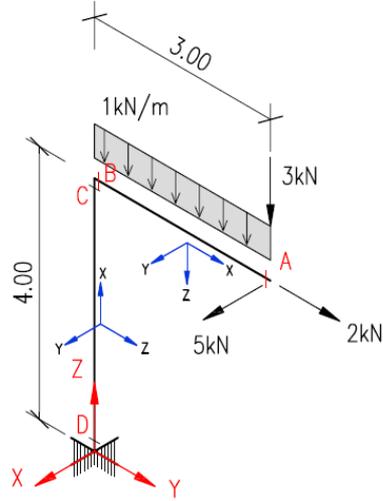
DIAGRAMAS  
3D

# Ejercicio

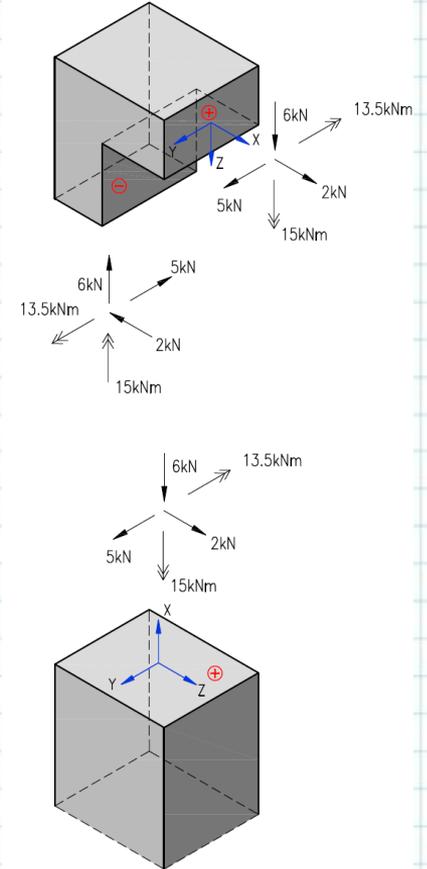
TEMA

TP6

DIAGRAMAS  
3D



PUNTO	$N_x$ [kN]	$Q_y$ [kN]	$Q_z$ [kN]	$M_x$ [kNm]	$M_y$ [kNm]	$M_z$ [kNm]
A	2	5	3	0	0	0
B	2	5	6	0	-13.5	15
C	-6	5	2	-15	-13.5	0
D	-6	5	2	-15	-21.5	20

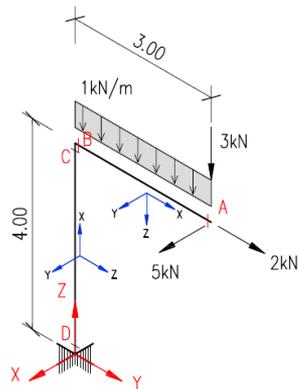


# Ejercicio

TEMA

TP6

DIAGRAMAS  
3D



$$\frac{\partial N_x(x)}{\partial x} = -q_x(x)$$

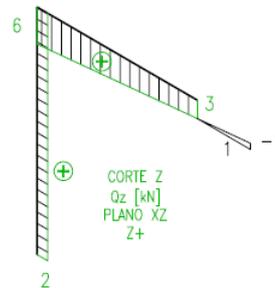
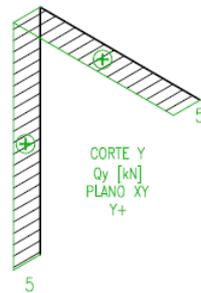
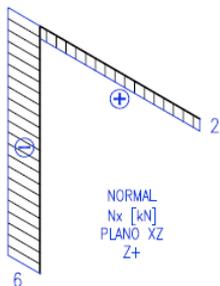
$$\frac{\partial M_x(x)}{\partial x} = -m_x(x)$$

$$\frac{\partial Q_y(x)}{\partial x} = -q_y(x)$$

$$\frac{\partial M_z(x)}{\partial x} = -Q_y(x)$$

$$\frac{\partial Q_z(x)}{\partial x} = -q_z(x)$$

$$\frac{\partial M_y(x)}{\partial x} = +Q_z(x)$$



PUNTO	Nx [kN]	Qy [kN]	Qz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
A	2	5	3	0	0	0
B	2	5	6	0	-13.5	15
C	-6	5	2	-15	-13.5	0
D	-6	5	2	-15	-21.5	20

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