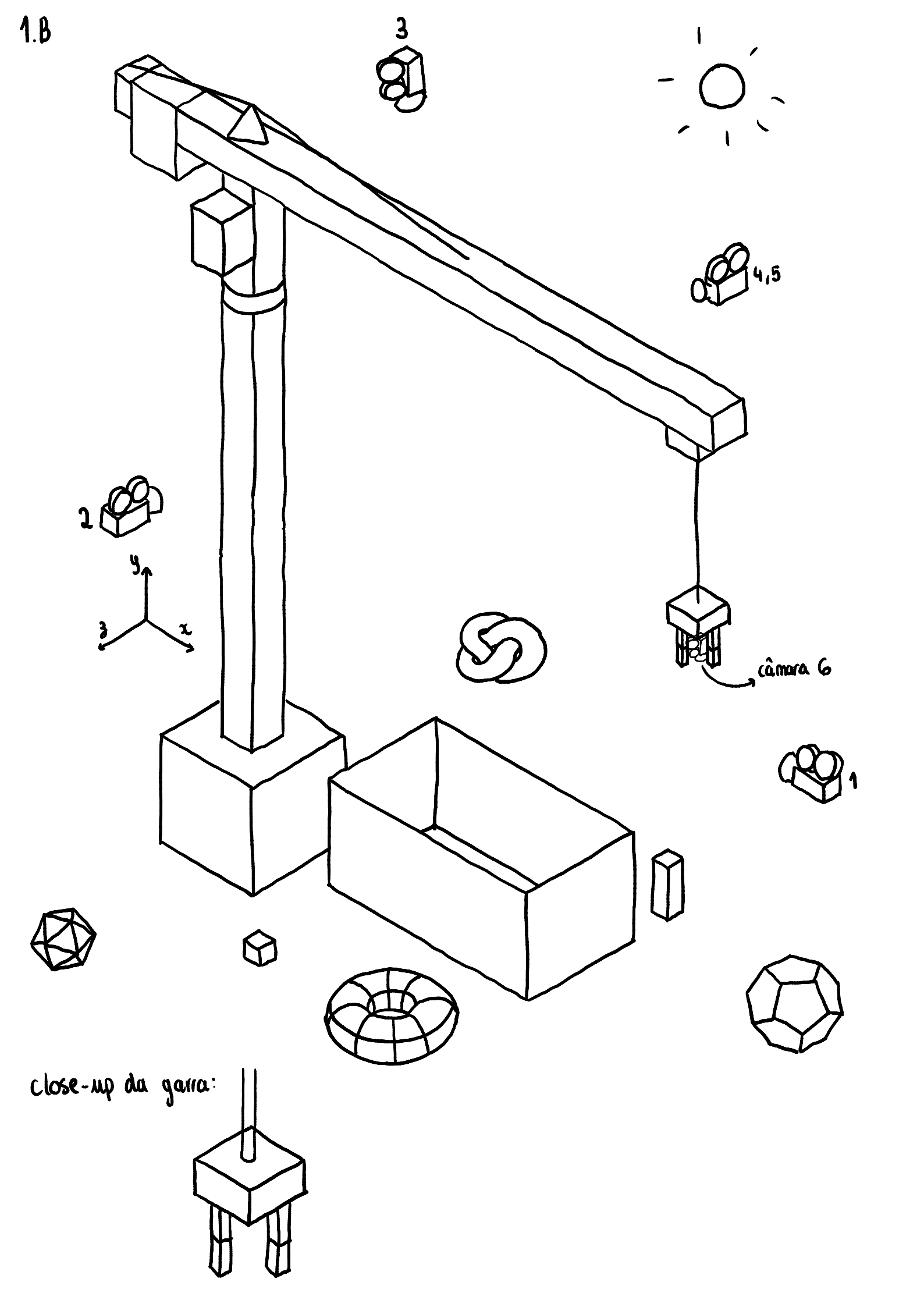
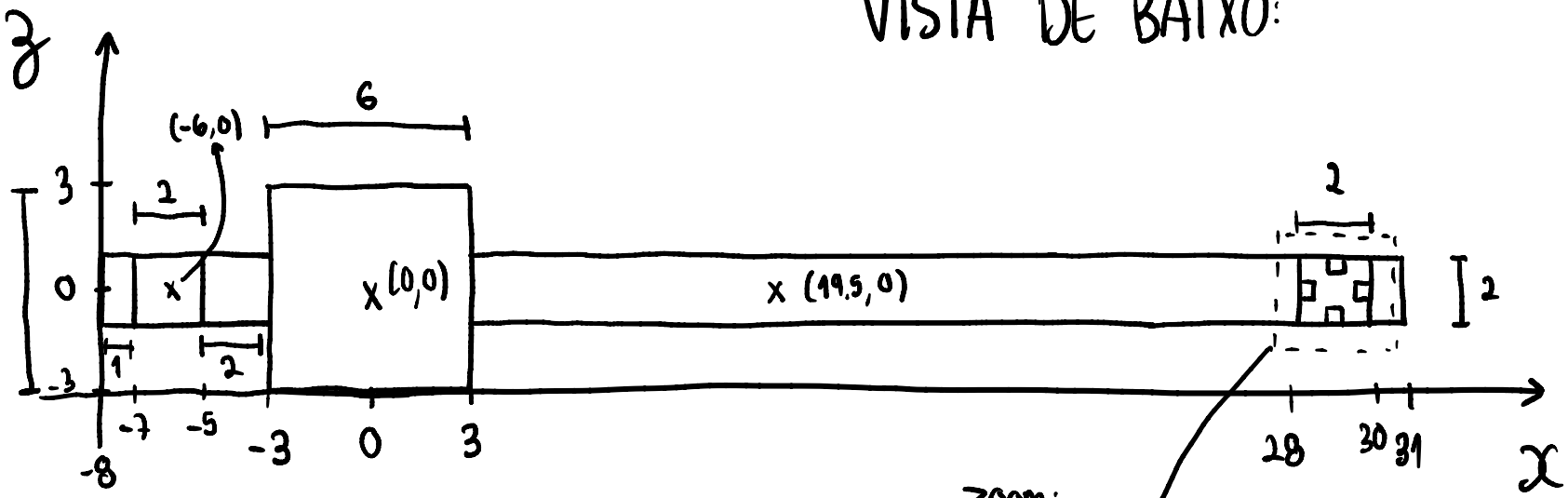
1.B



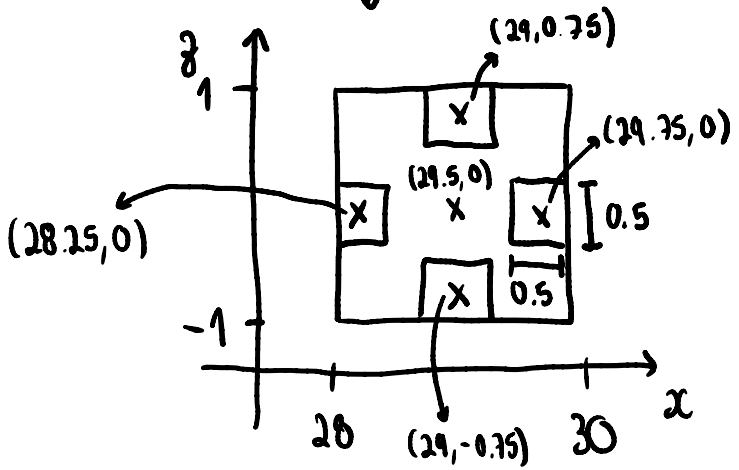
close-up da garra:

2.B 16 cubos + 4 cilindros + 1 tetraedro

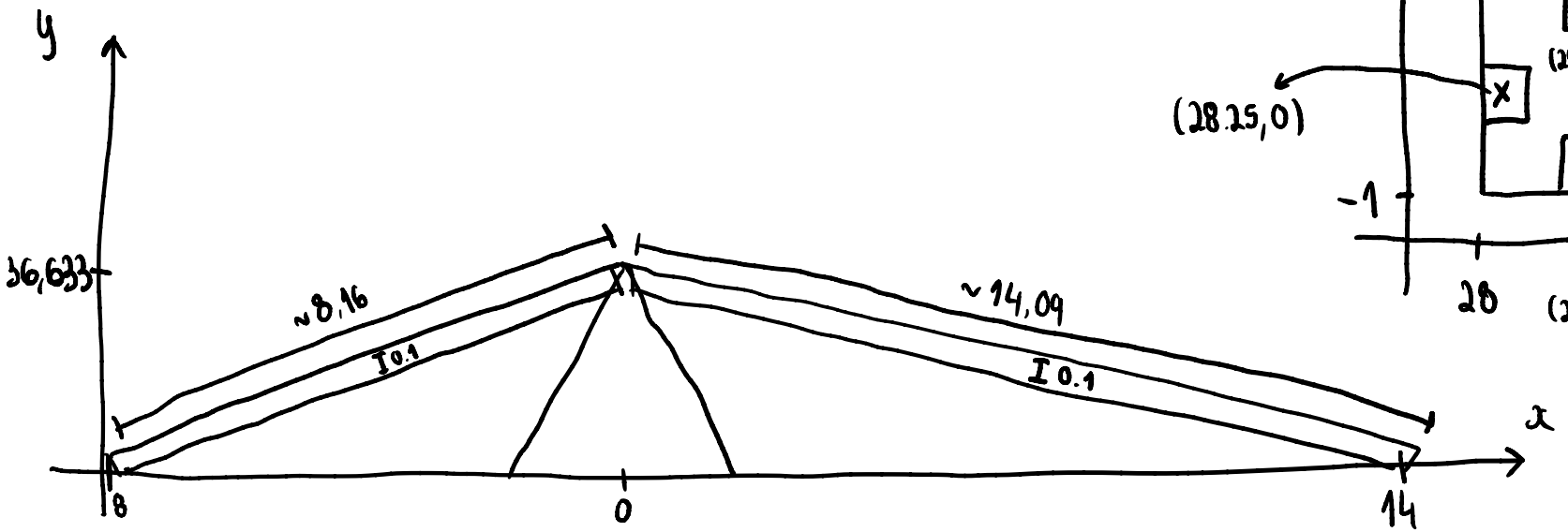
VISTA DE BAIXO:



zoom:

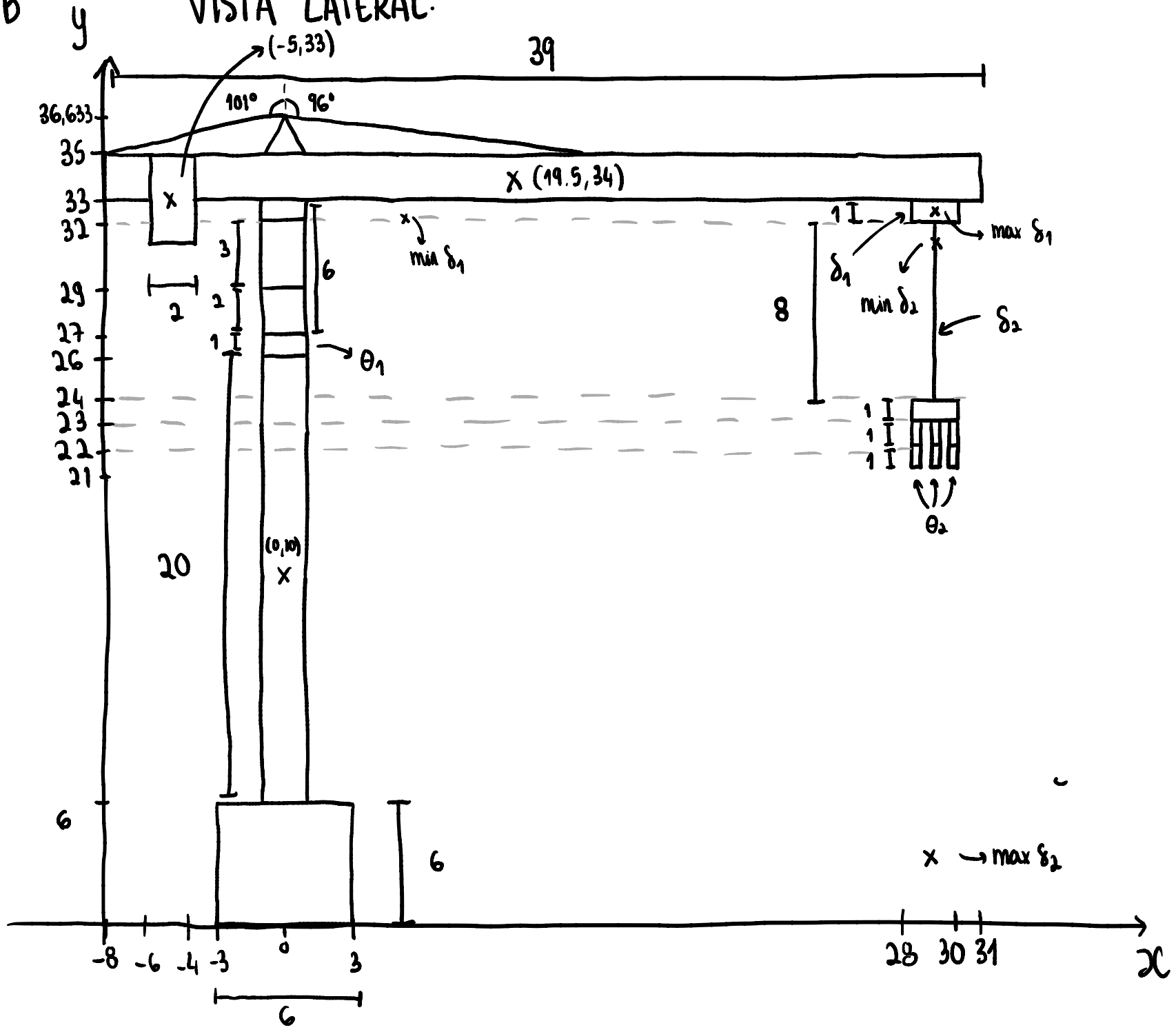


TIRANTES:



2.B

VISTA LATERAL:



min δ_1 - 5

max δ_1 - 29

min δ_2 - 1

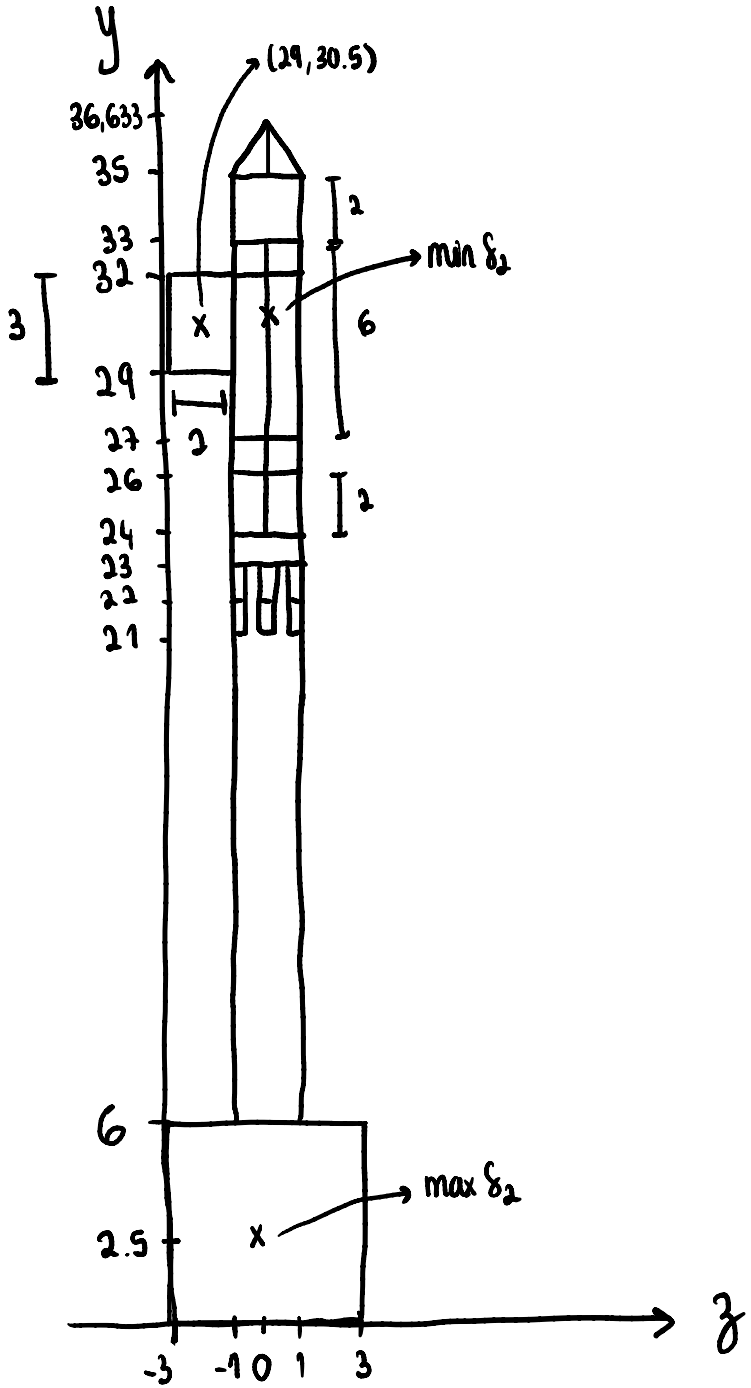
max δ_2 - 28,5

θ_1 - 360°

θ_2 - 90°

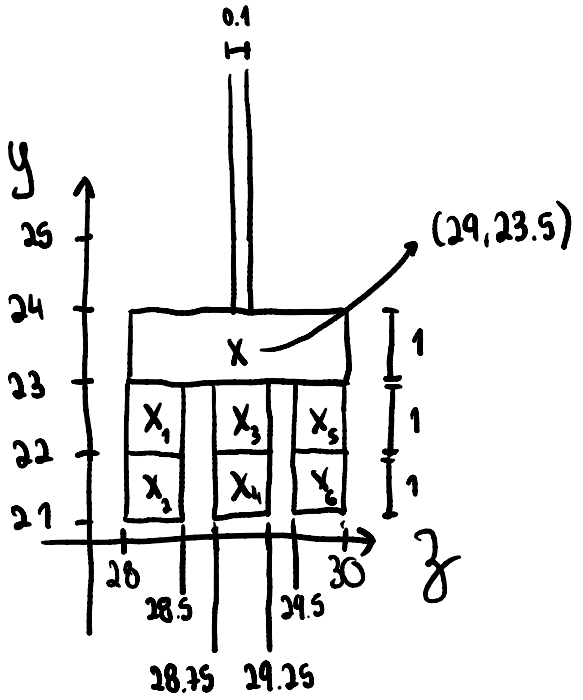
2.B

VISTA DE FRENTE:



VISTA LATERAL:

(zoom na garra)



Legenda:

$X_1 \rightarrow (28.25, 22.5)$

$X_2 \rightarrow (28.25, 21.5)$

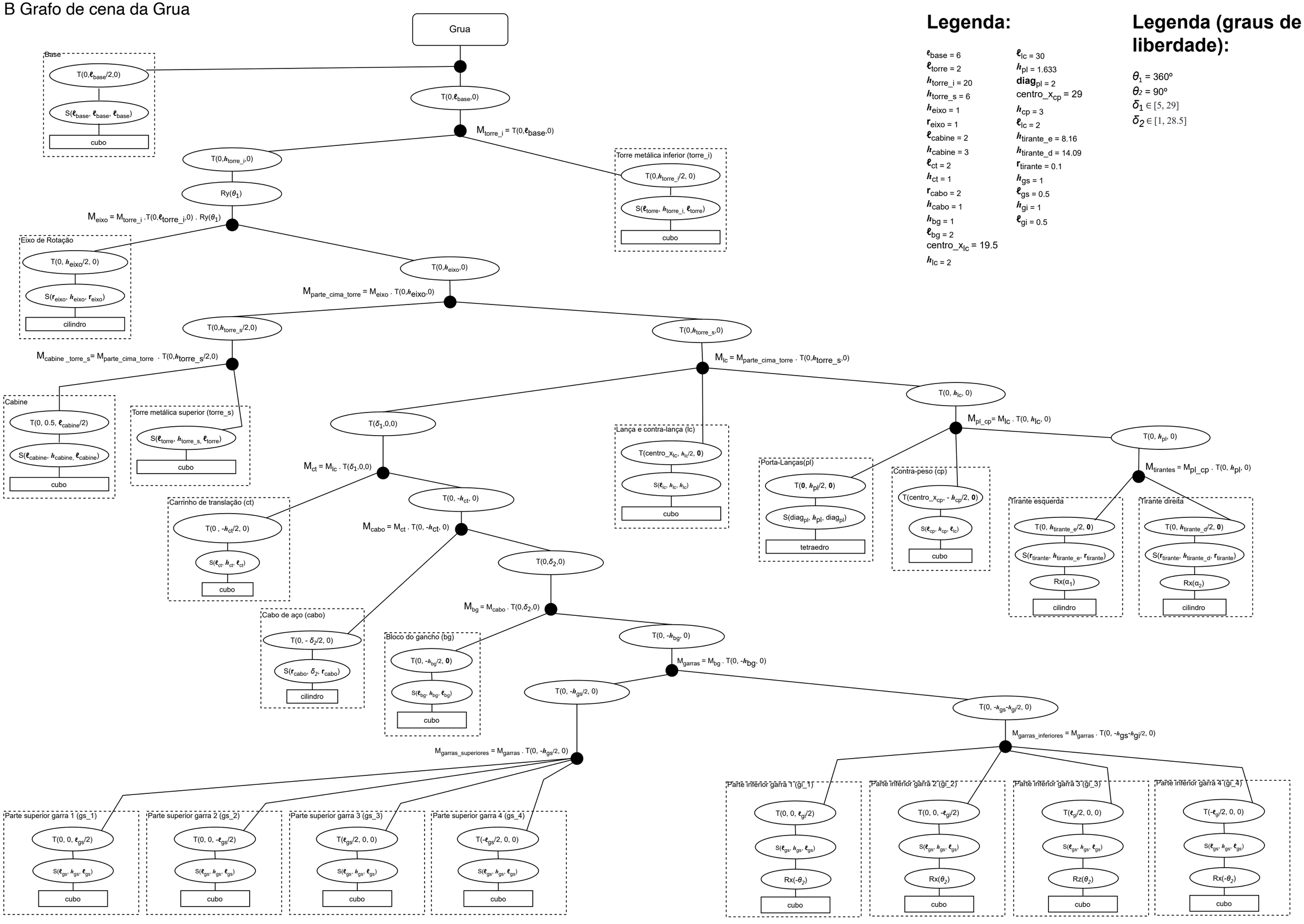
$X_3 \rightarrow (29, 22.5)$

$X_4 \rightarrow (29, 21.5)$

$X_5 \rightarrow (29.75, 22.5)$

$X_6 \rightarrow (29.75, 21.5)$

3. B Grafo de cena da Grua



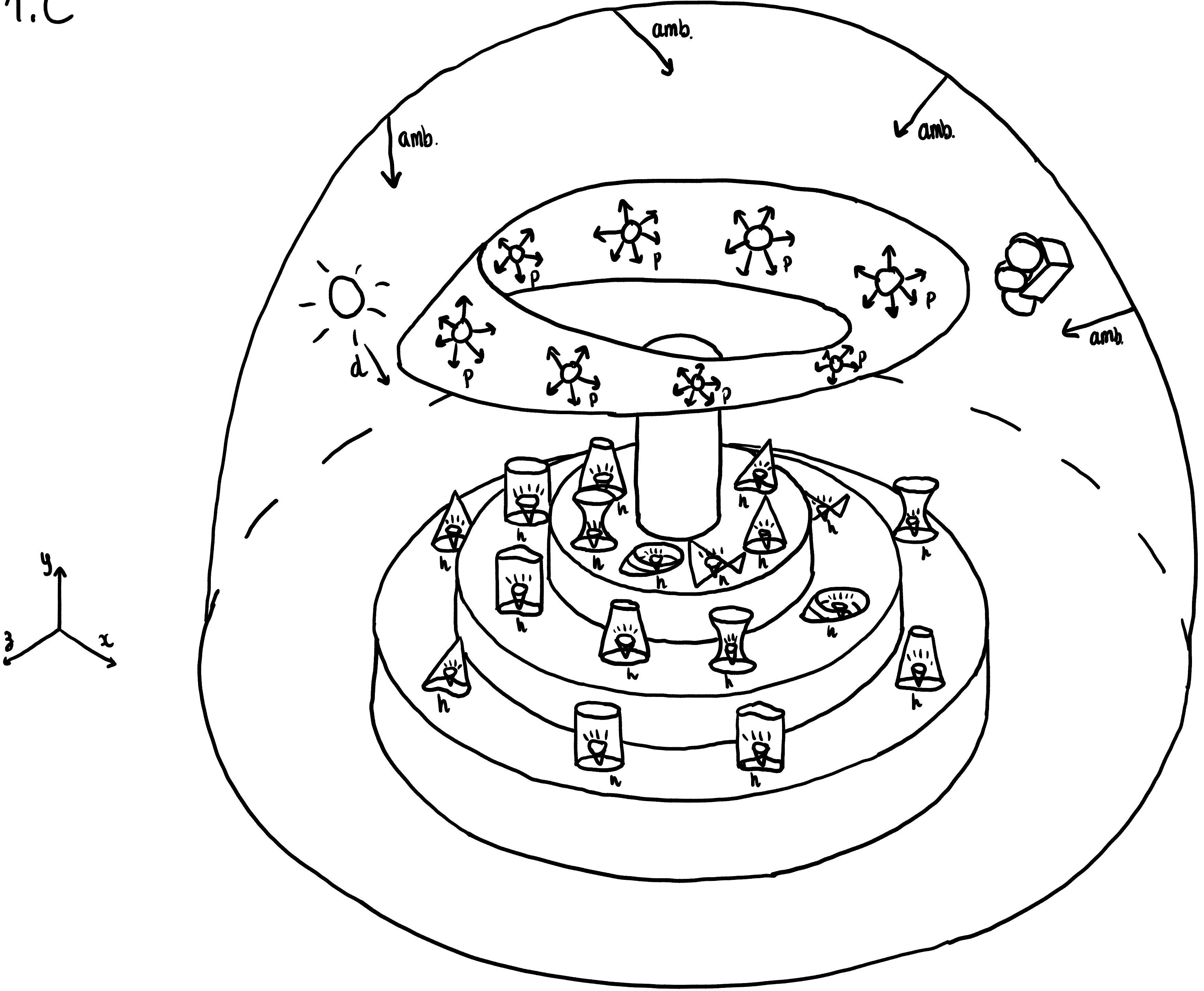
Legenda:

$\ell_{base} = 6$
$\ell_{torre} = 2$
$h_{torre\_i} = 20$
$h_{torre\_s} = 6$
$h_{eixo} = 1$
$r_{eixo} = 1$
$\ell_{cabine} = 2$
$h_{cabine} = 3$
$\ell_{ct} = 2$
$h_{ct} = 1$
$r_{cabo} = 2$
$h_{cabo} = 1$
$h_{bg} = 1$
$\ell_{bg} = 2$
$centro\_x_{lc} = 19.5$
$h_{lc} = 2$
$\ell_{lc} = 30$
$h_{pl} = 1.633$
$diag_{pl} = 2$
$centro\_x_{cp} = 29$
$h_{cp} = 3$
$\ell_{lc} = 2$
$h_{tirante\_e} = 8.16$
$h_{tirante\_d} = 14.09$
$r_{tirante} = 0.1$
$h_{gs} = 1$
$\ell_{gs} = 0.5$
$h_{gi} = 1$
$\ell_{gi} = 0.5$

Legenda (graus de liberdade):

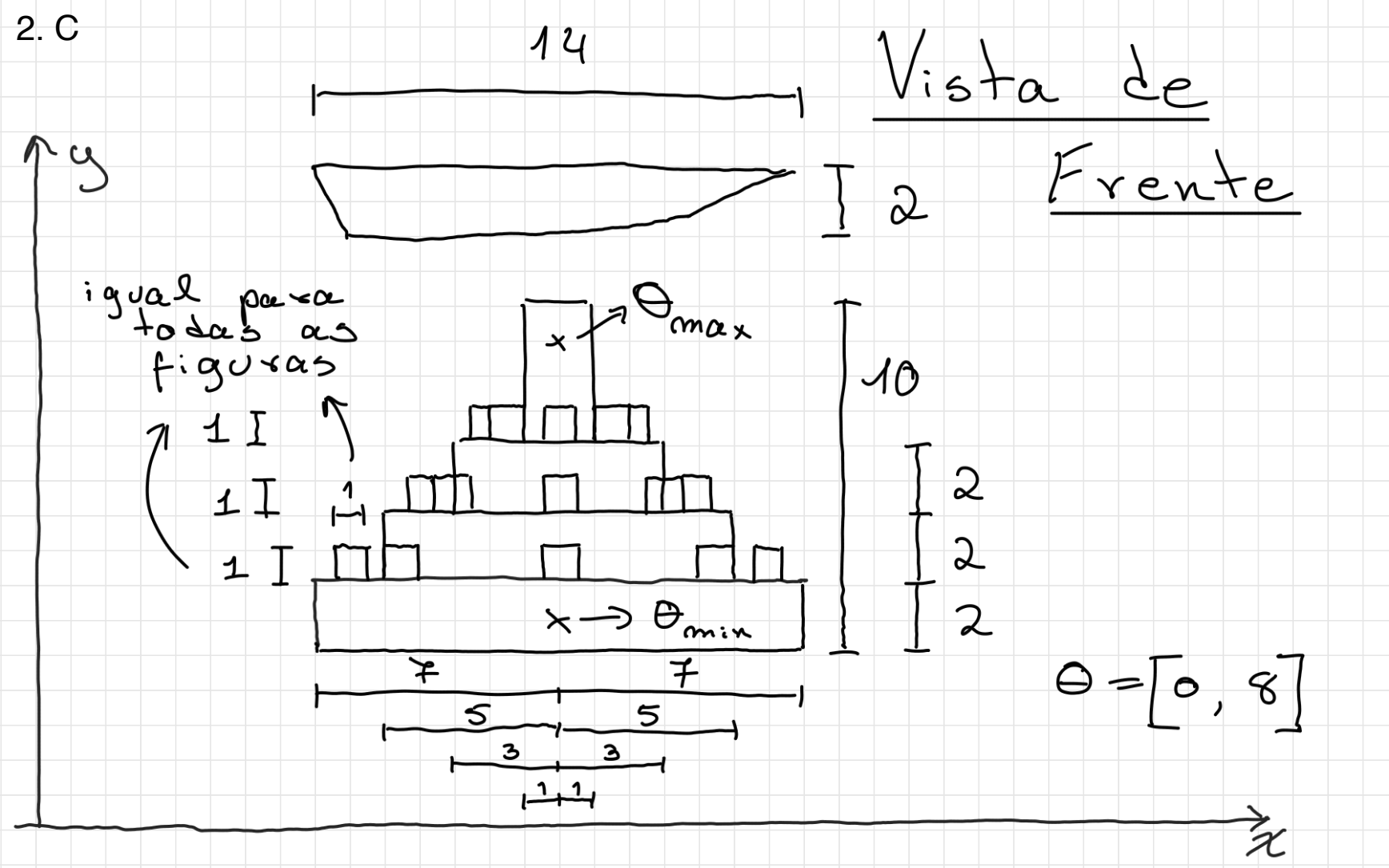
$\theta_1 = 360º$
$\theta_2 = 90º$
$\delta_1 \in [5, 29]$
$\delta_2 \in [1, 28.5]$

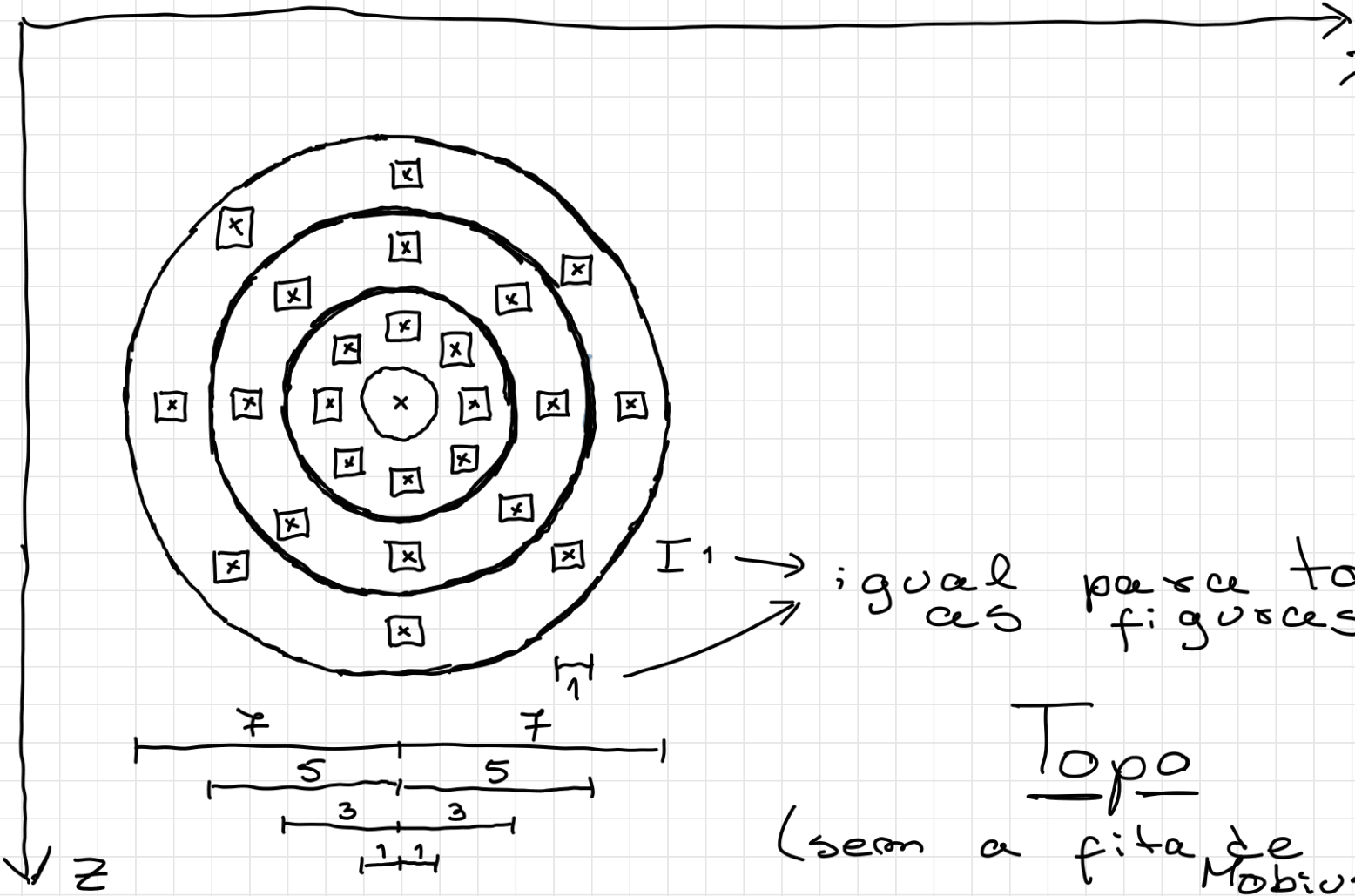
1.C



d - direcional
amb - ambiente
h - spotlight
p - pontuais

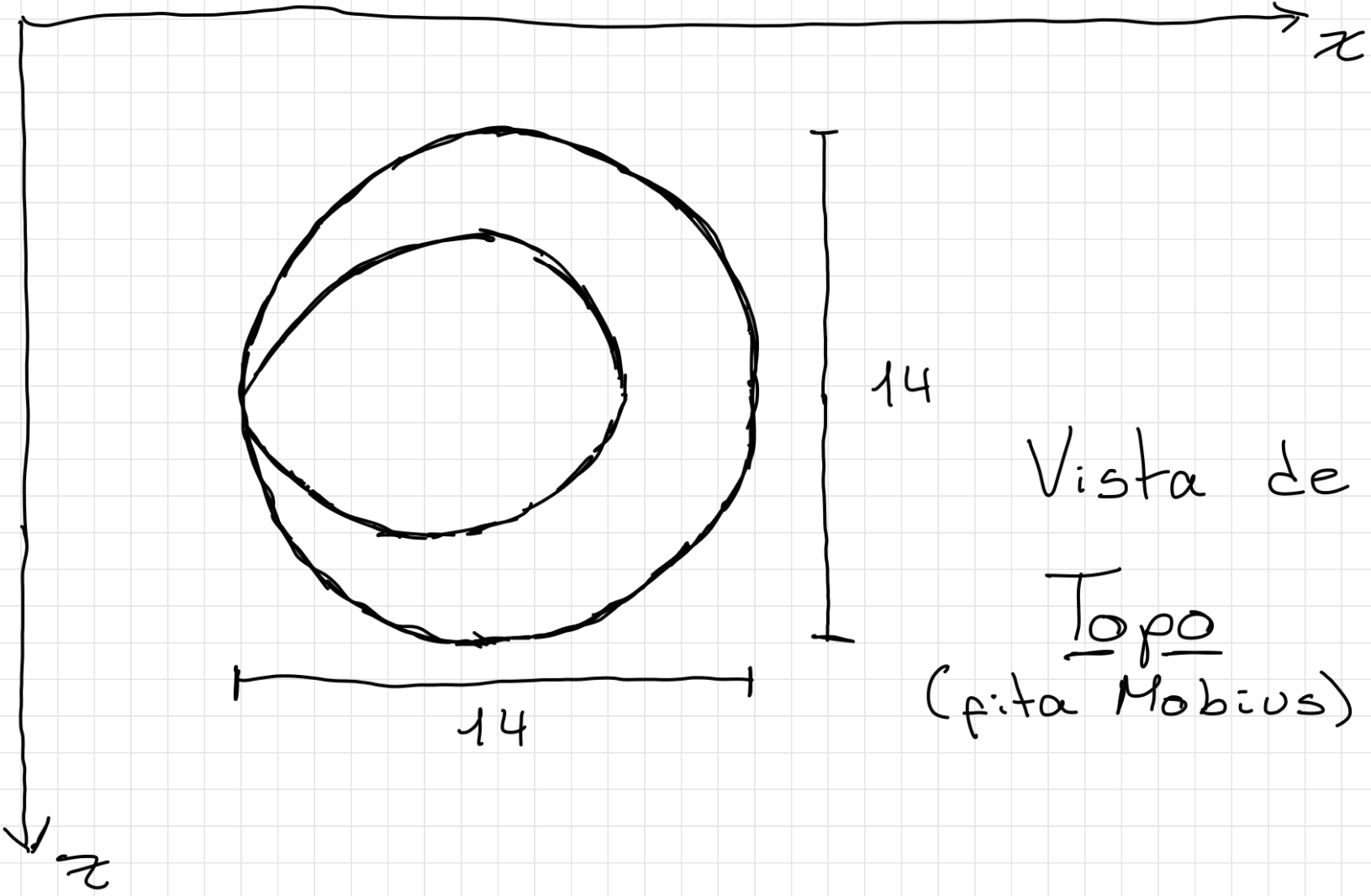
2. C


14
Vista de Frente
2
y
igual para todas as figuras
1 I
1 I
1 I
1
x
θ_{max}
10
2
2
2
$x \rightarrow \theta_{min}$
7
7
5
5
3
3
1
1
x
$\theta = [0, 8]$



Topo

(sem a fita de Mobius)

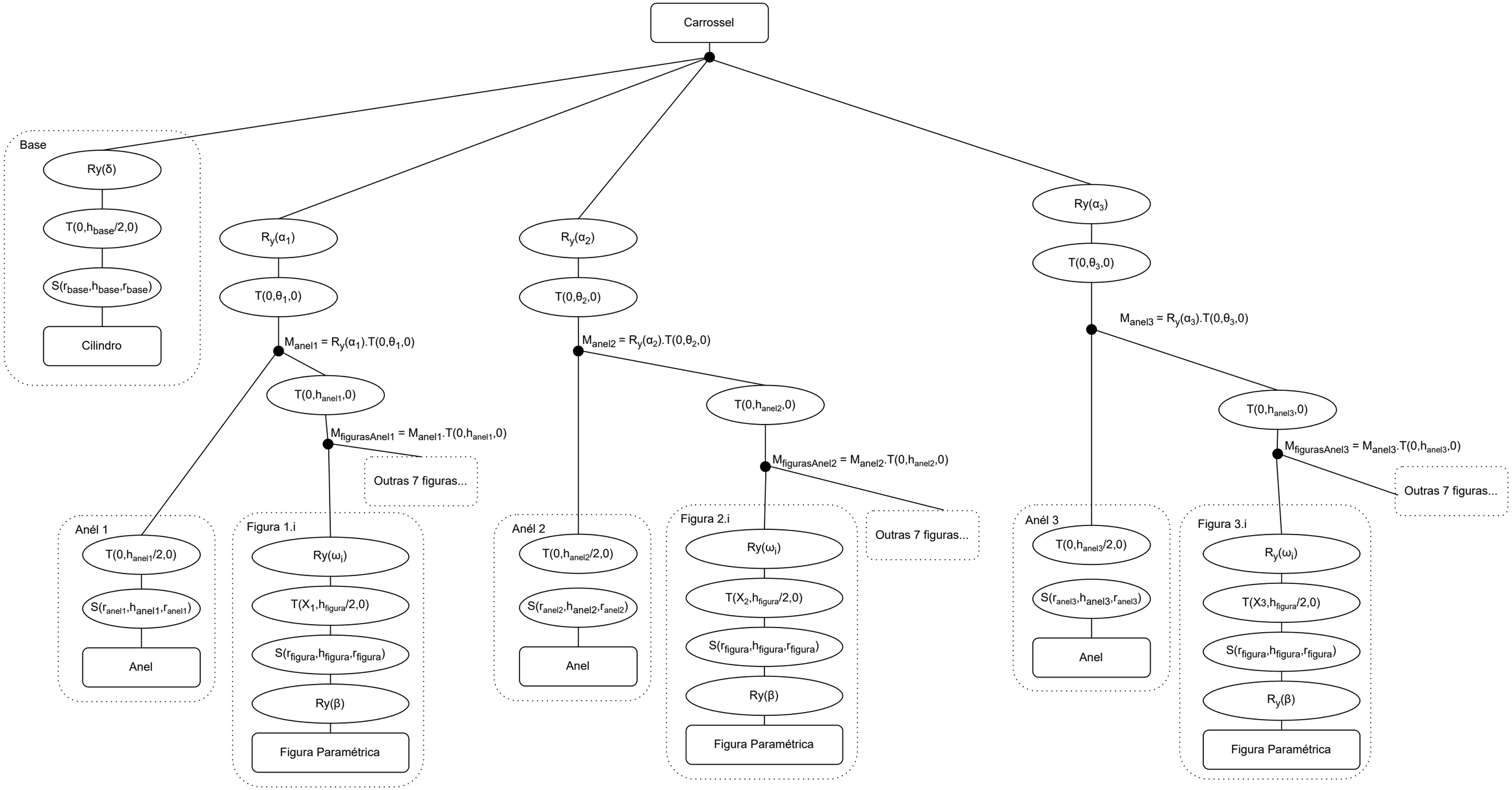


Vista de

Topo

(fita Mobius)

3. C Grafo de cena do Carrossel



Graus de Liberdade

θ_1 - altura do anél 1 = [0, 8]

θ_2 - altura do anél 2 = [0, 8]

θ_3 - altura do anél 3 = [0, 8]

Legenda

δ - rotação do cilindro base

α_1 - rotação do anél 1

α_2 - rotação do anél 2

α_3 - rotação do anél 3

β - rotação das figuras sobre elas próprias

ω - [0º, 45º, 90º, 135º, 180, 225º, 270º, 315º]

$h_{anel1} = h_{anel2} = h_{anel3} = 2$

$r_{anel1} = 7$

$r_{anel2} = 5$

$r_{anel3} = 3$

X_1 - (2/3) r_{anel1}

X_2 - (4/5) r_{anel2}

X_3 - (6/7) r_{anel3}

$h_{base} = 10$

$r_{base} = 1$

$r_{figura} = 1$

$h_{figura} = 1$