



Departamento do Núcleo de Ciências Exatas e Tecnológicas
Área Engenharias

**Material Instrucional Técnico de Apoio às Disciplinas de
Desenho Técnico e correlacionadas Nível Tecnólogos e
Engenharias**

Marcelo Murga

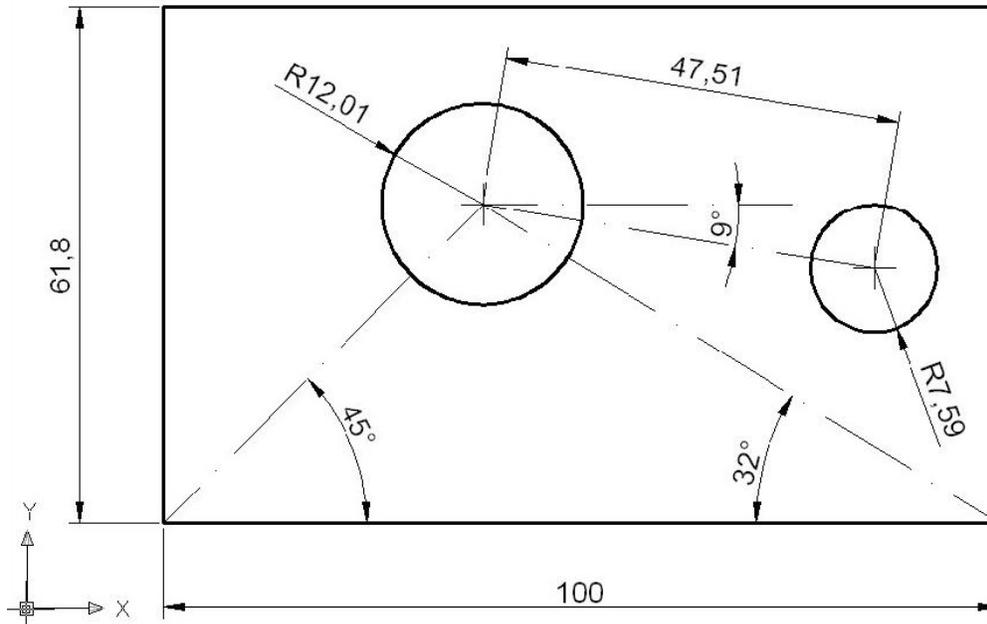
DESENHO TÉCNICO

CAPÍTULO 10 CAD

CAD – CADERNO DE EXERCÍCIOS

EXERCÍCIO Nº1:

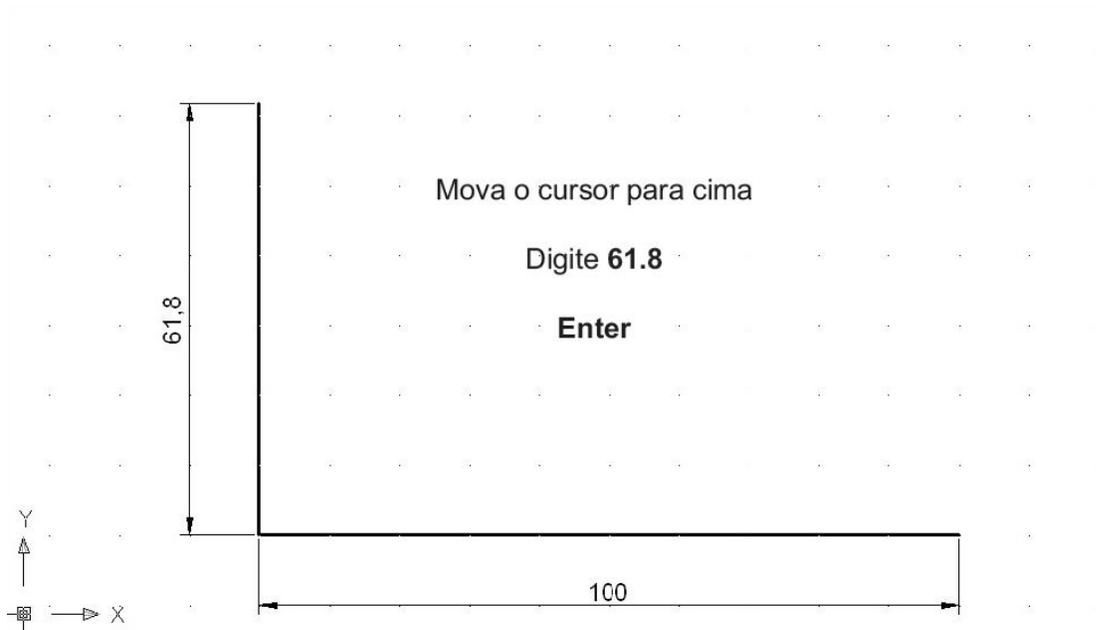
Redesenhe esta figura



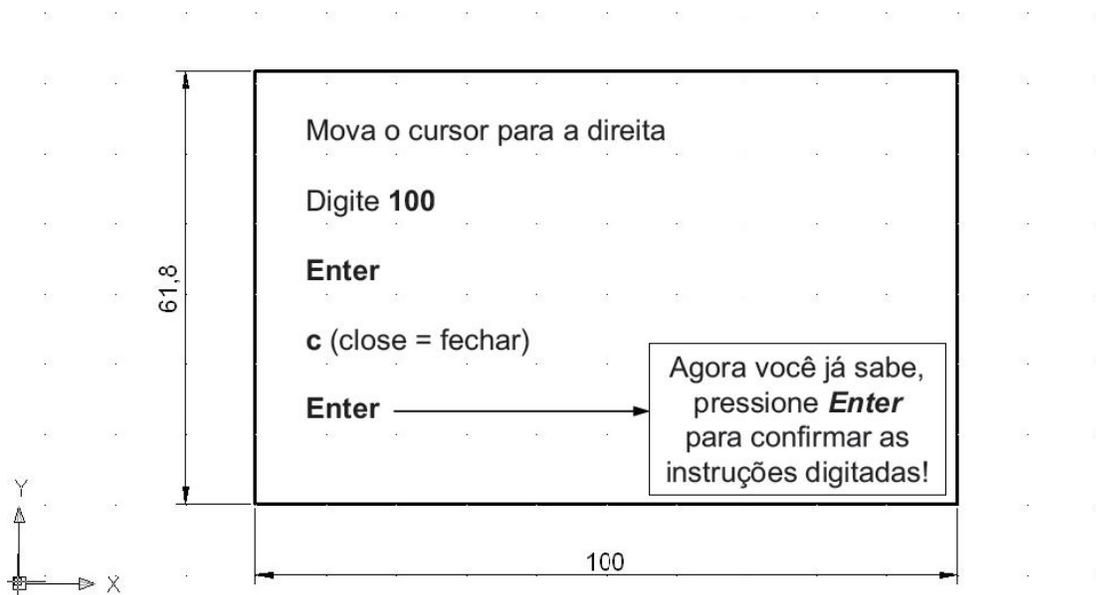
Etapa 1:

Digite **L**
 Pressione **Enter**
 Clique num ponto **A** da tela
 Ative **Ortho** (tecla F8)
 Arraste o cursor para a esquerda
 Digite **100**

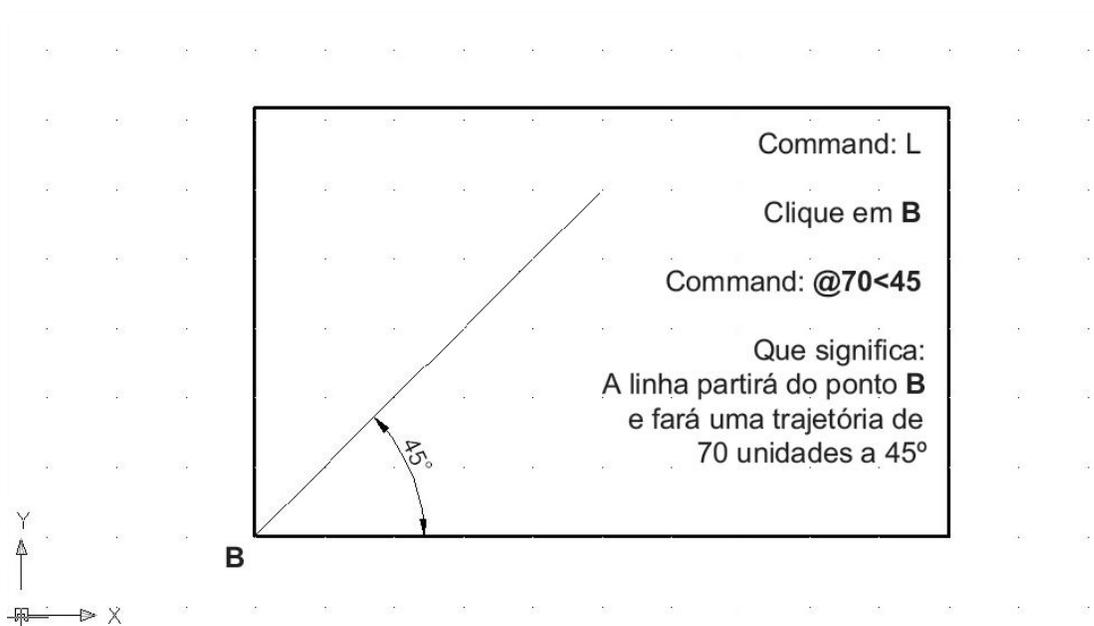
Etapa 2:



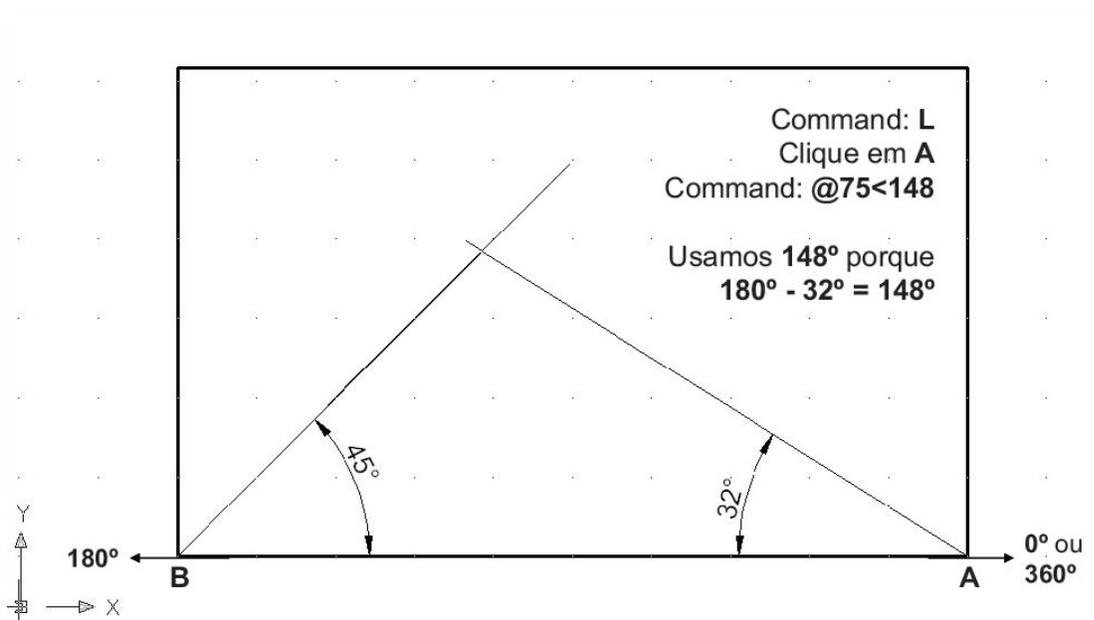
Etapa 3:



Etapa 4:



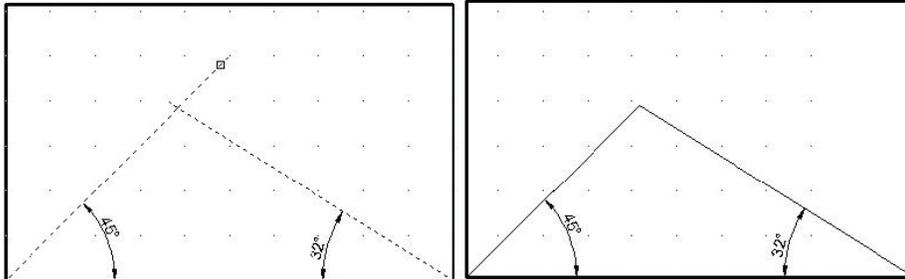
Etapa 5:



Etapa 6:

Para tirar o excedente das linhas use o comando **Trim (tr)**

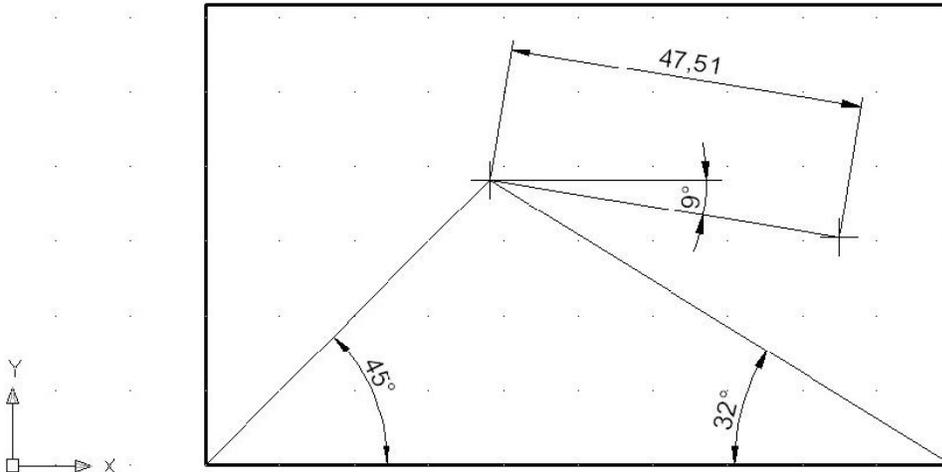
Tr > Enter > Selecione as linhas >
Enter > clique nas partes a serem apagadas.



Etapa 7:

Command: **line**
Command: **@47.51<351**

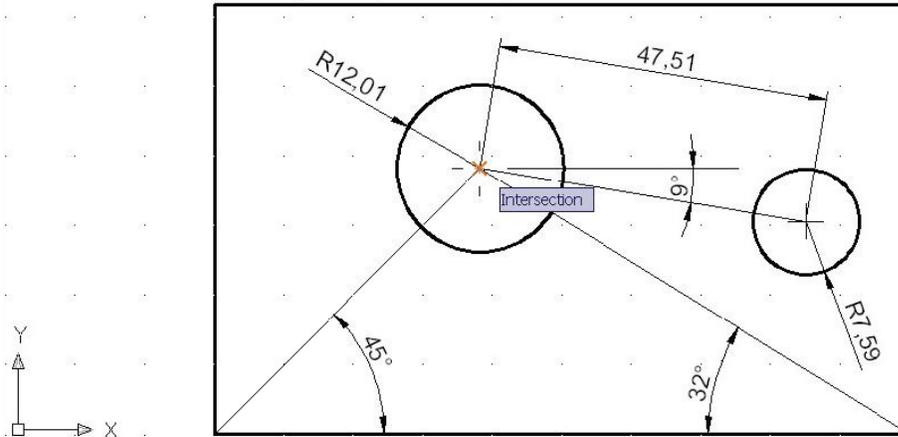
Onde $360^\circ - 9^\circ = 351^\circ$



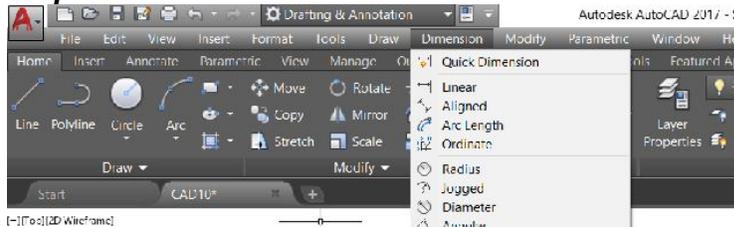
Etapa 8:

Command: **circle**
Clique no ponto de interseção
Specify radius (...): **12.01**

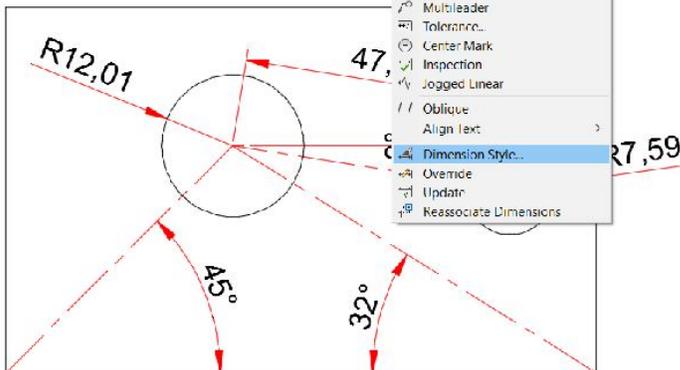
Repita o processo para a outra circunferência.



Etapa 9:



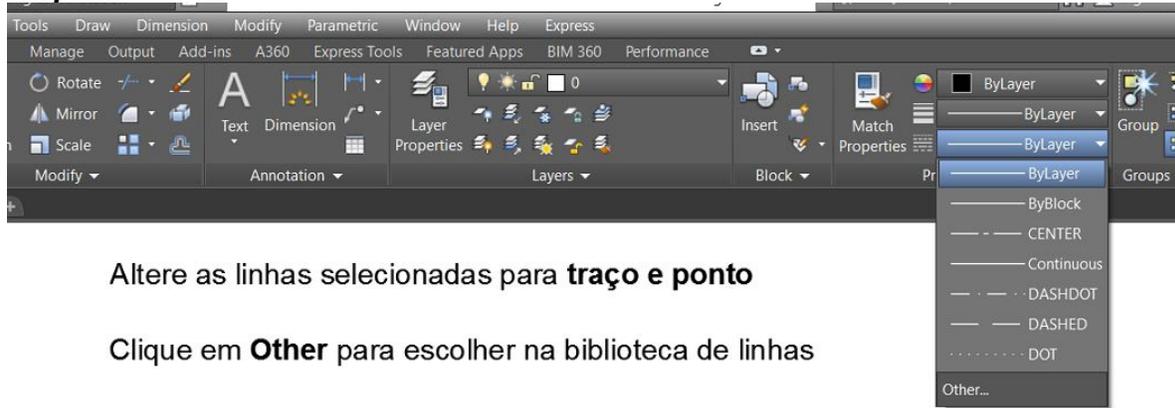
Cote utilizando o menu Dimension:



Em Dimension Style é possível configurar os elementos de coteagem

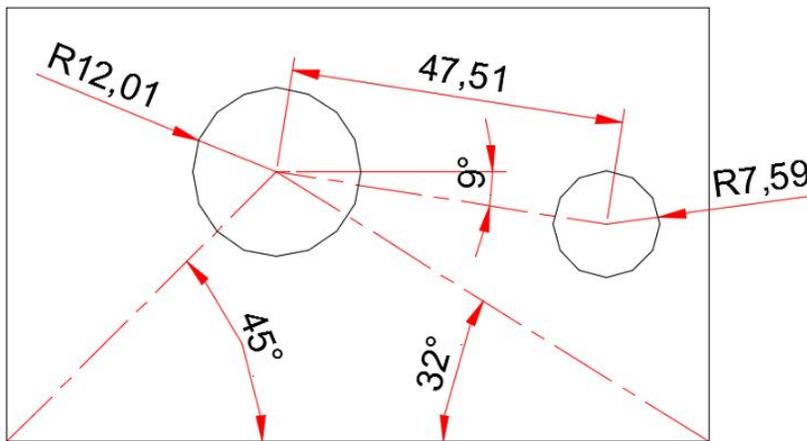


Etapa 10:

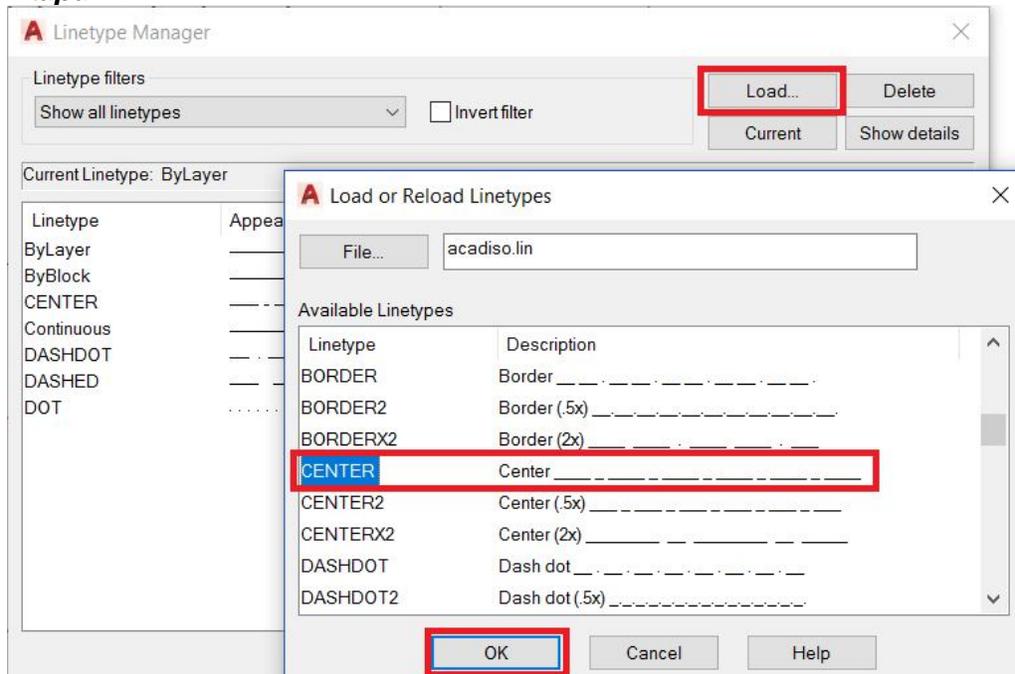


Altere as linhas selecionadas para **traço e ponto**

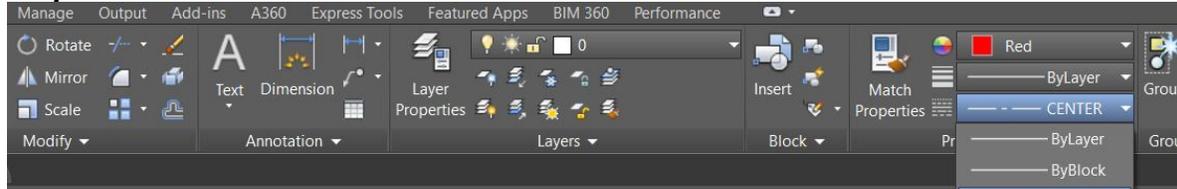
Clique em **Other** para escolher na biblioteca de linhas



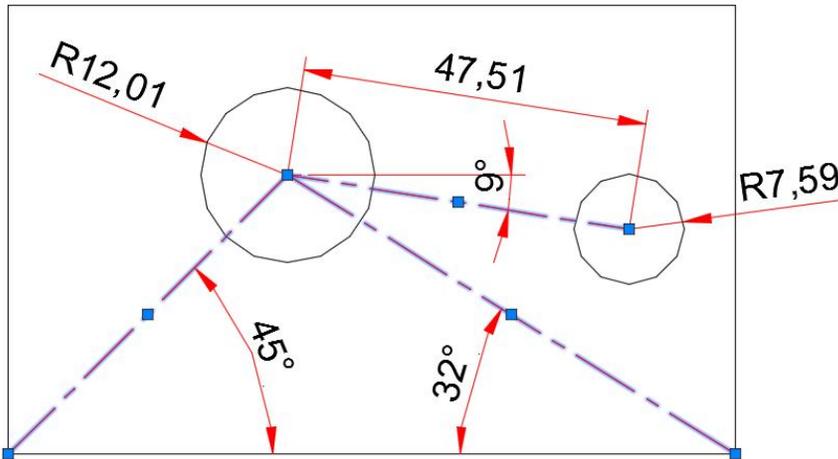
Etapa 11:



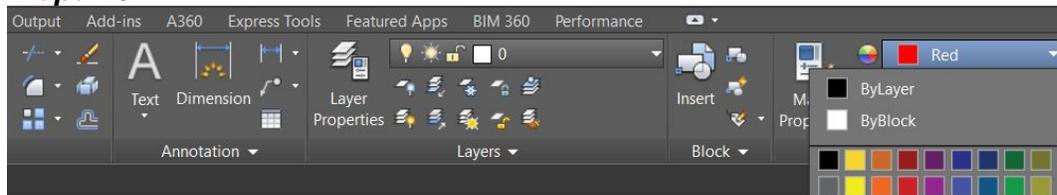
Etapa 12:



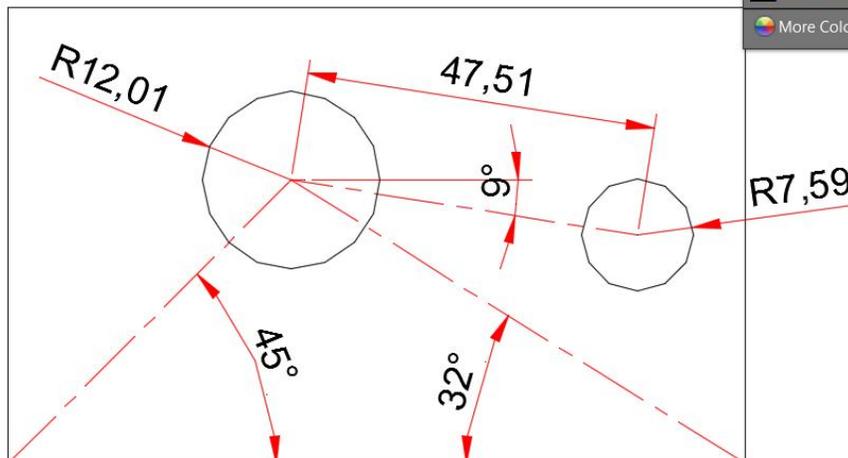
Basta seleccionar a linha e escolher o tipo desejado no **linetype**



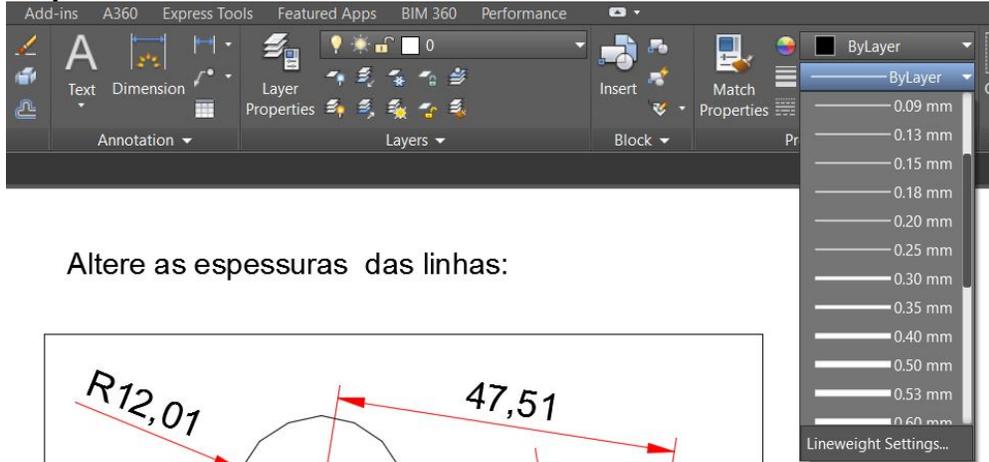
Etapa 13:



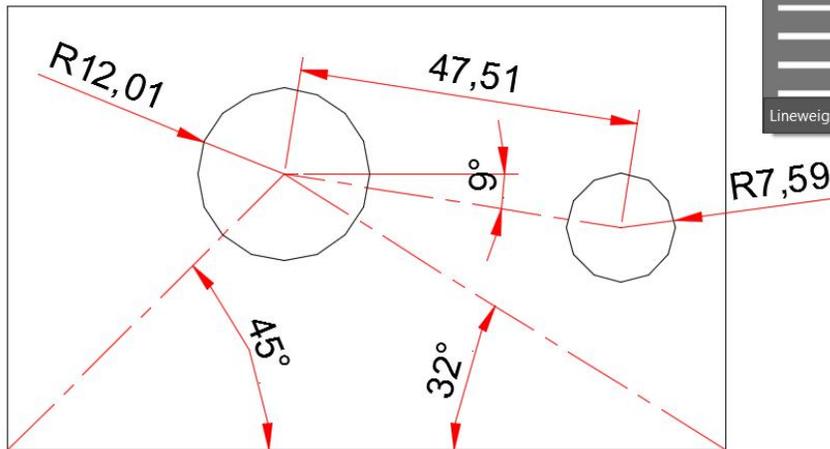
Altere as cores das linhas **object color**:



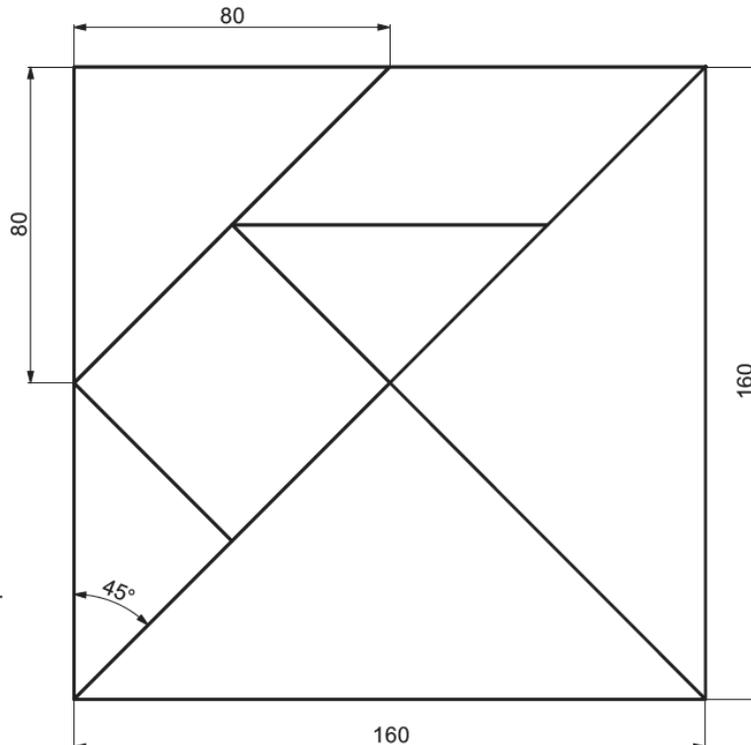
Etapa 14:



Altere as espessuras das linhas:

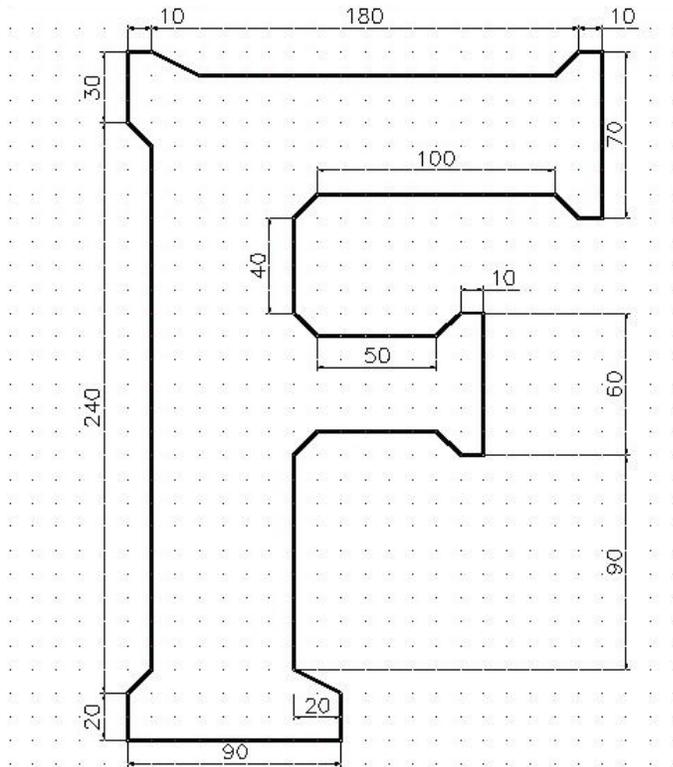


EXERCÍCIO Nº 2:

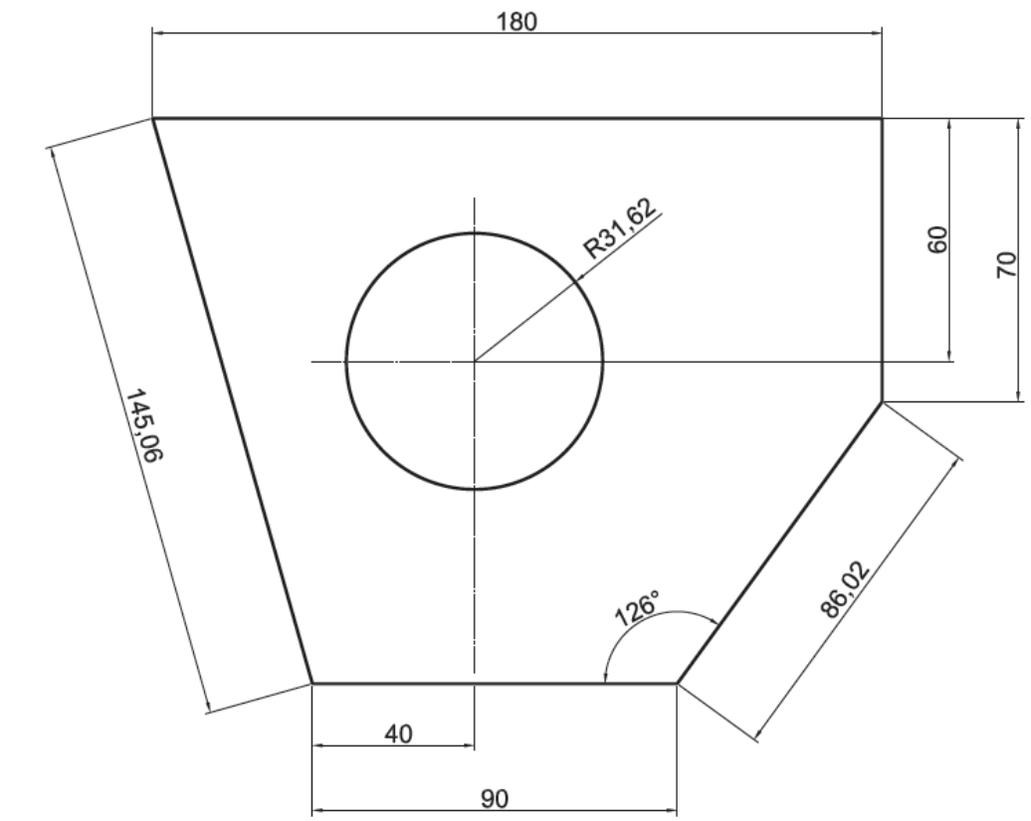


1. Redesenhe o Tangram.
2. Crie um novo modelo e apresente-o cotado.

EXERCÍCIO Nº 3:

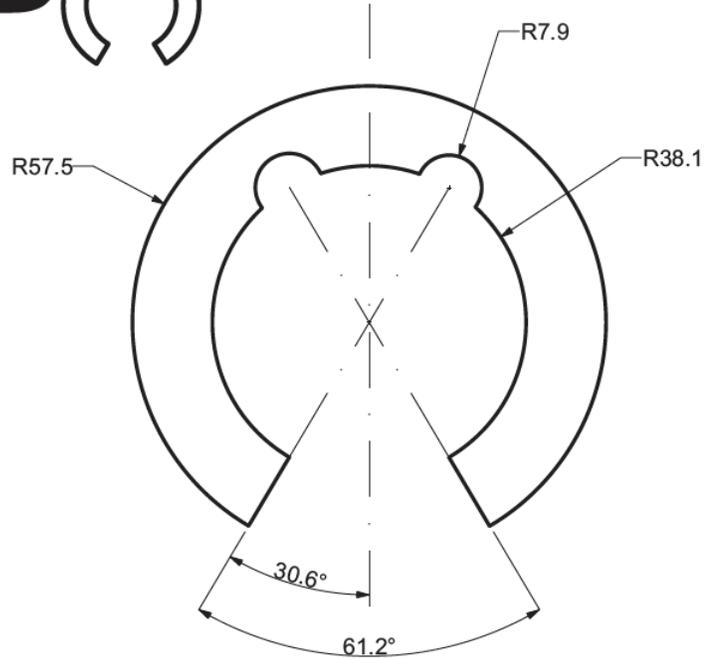


EXERCÍCIO Nº 4:



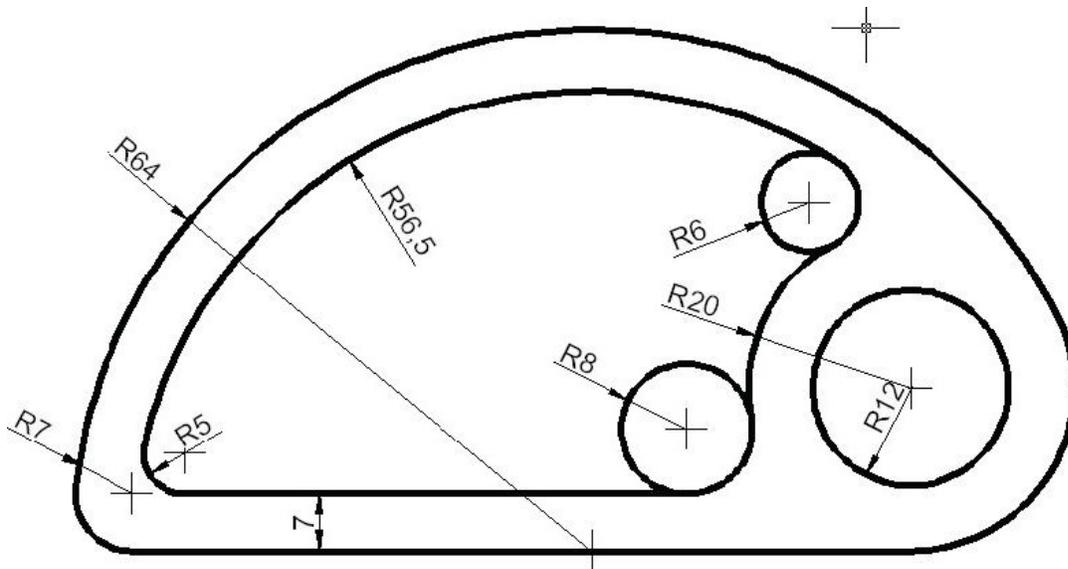
EXERCÍCIO Nº 5:

HIPP 



Redesenhe o logotipo.

EXERCÍCIO Nº 6:



Etapa 1:

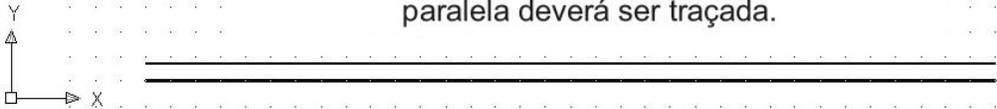
Primeiro desenhe uma linha horizontal que será a base do desenho e prossiga:

Command: **offset**
Specify offset distance: 7

Clique na linha e depois em algum ponto acima da mesma.

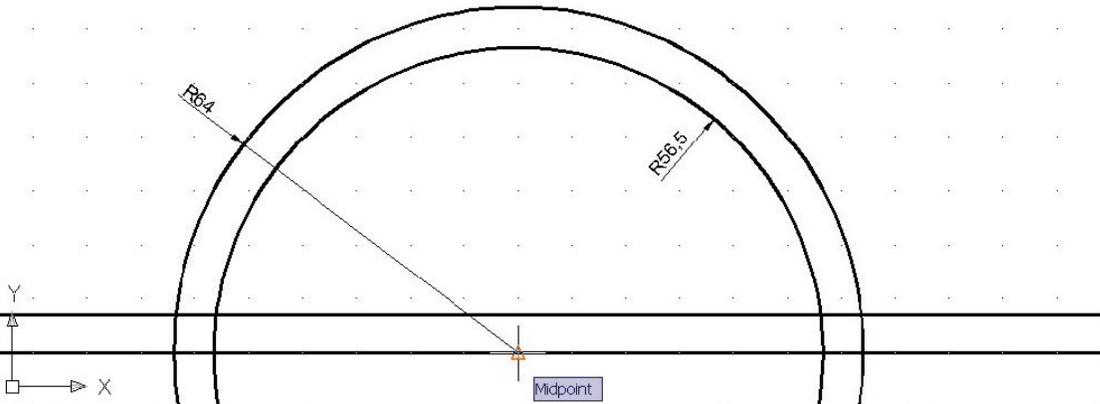
ENTER para deixar o comando

Offset é um traçador de retas paralelas, 7 é a distância entre as linhas, o clique na tela acima da linha indica para que lado a paralela deverá ser traçada.



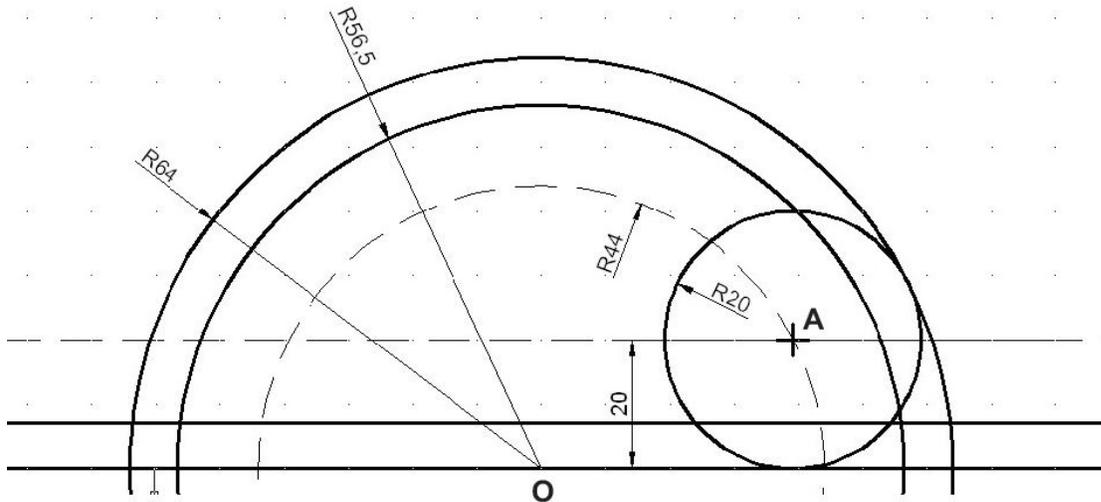
Etapa 2:

Command: **c**
Digite: **mid**
Clique no meio da linha base
Digite: **64**
Repita o processo e digite **56.5**



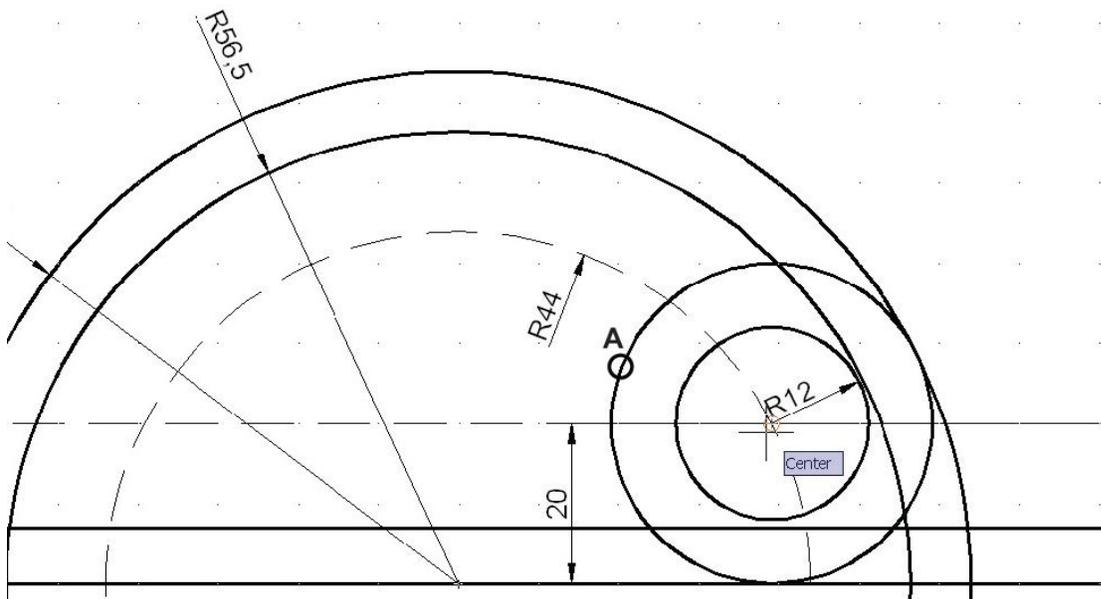
Etapa 3:

Trace um arco de raio 44 no mesmo centro **O** utilizado anteriormente.
Trace uma paralela de distância 20, de acordo com a indicação.
O ponto **A** encontrado é o centro da circunferência de raio 20.



Essa foi uma passagem didática, que reviu os conceitos do Desenho Geométrico.
Será mostrado um meio mais direto de fazer essa construção.

Etapa 4:



Command: **c**
 Digite: **cen**
 Clique próximo da circunferência de raio 20 (**A**)
 Digite: **12**

Etapa 5:

Circunferência tangente de raio **6**:

Digite em sequência, de acordo com os parâmetros que são pedidos pelo programa:

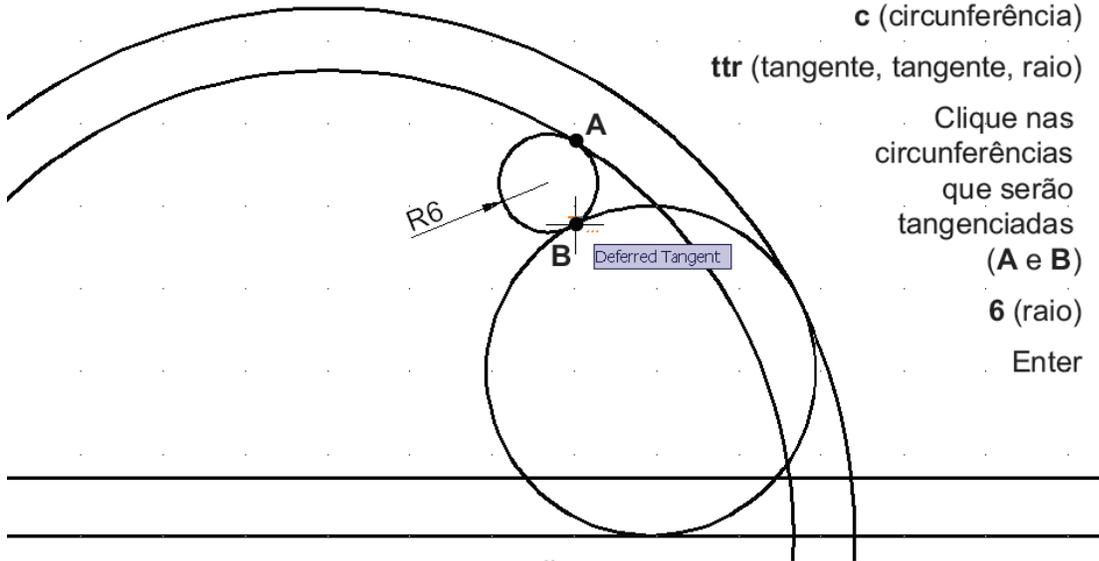
c (circunferência)

ttr (tangente, tangente, raio)

Clique nas circunferências que serão tangenciadas
(A e B)

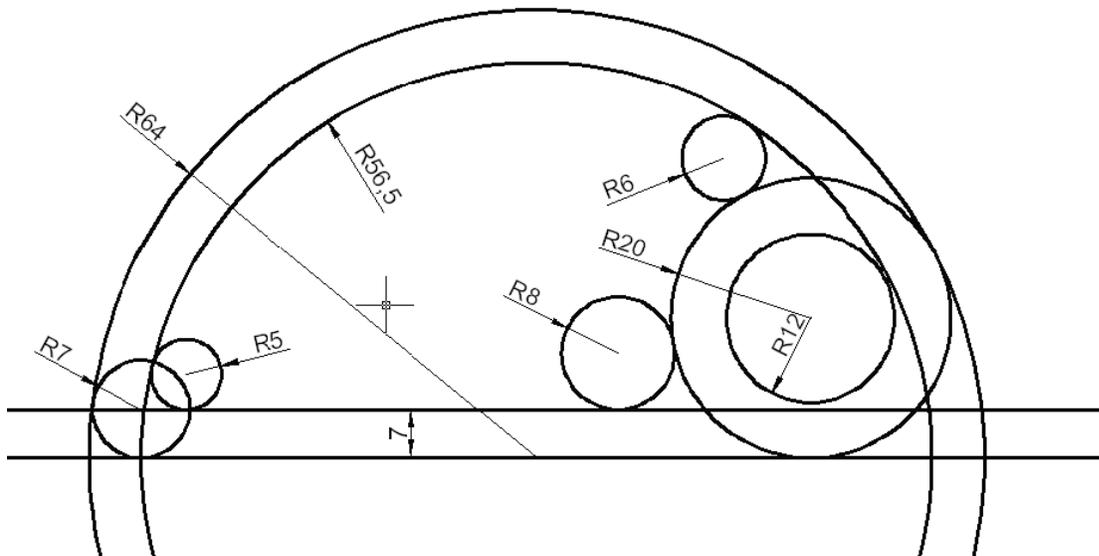
6 (raio)

Enter



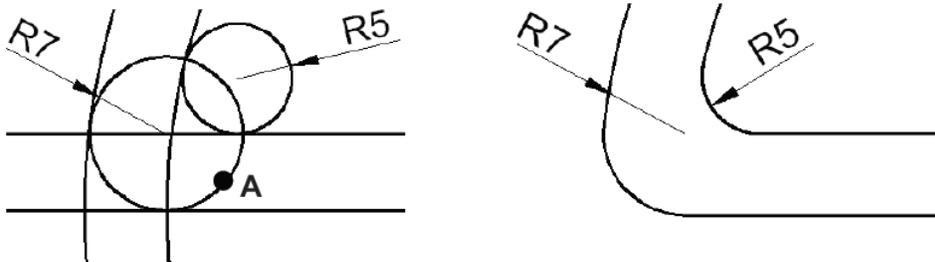
Etapa 6:

Desenhe da mesma forma as outras tangências.



Etapa 7:

Use **TRIM** para tirar o excedente.

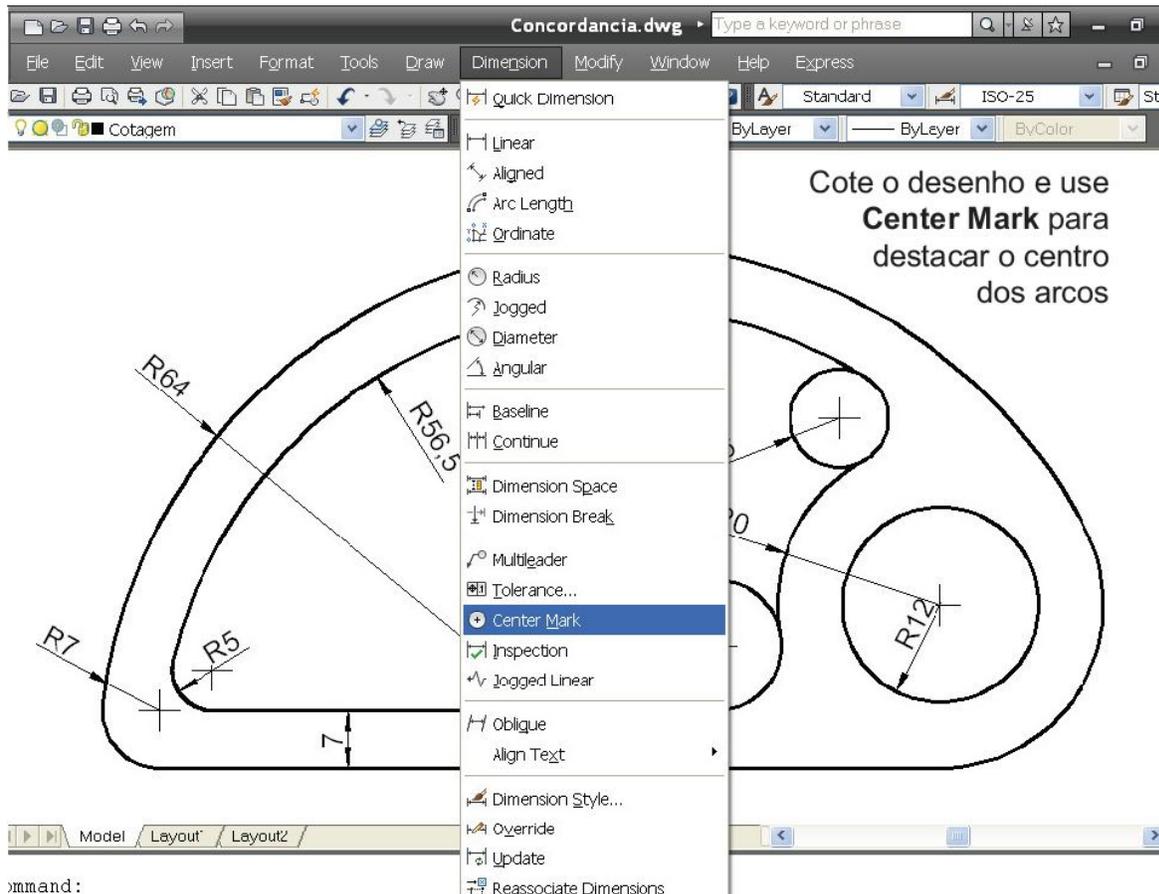


Clique no que irá permanecer (A)
Enter

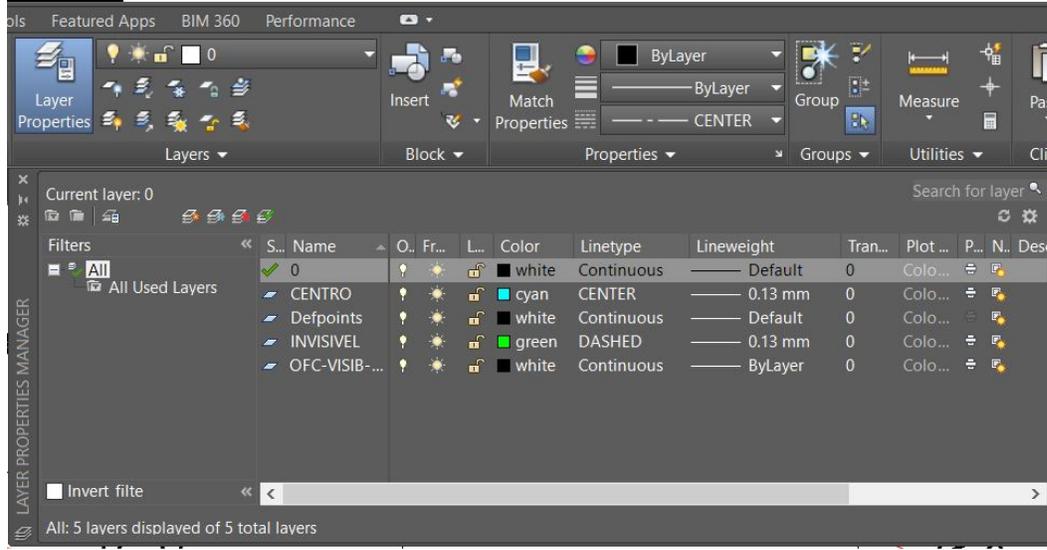
Clique no que será eliminado

Dependendo do caso, **selecione tudo**,
pressione **Enter** e clique no que deve ser apagado.

Etapa 8:



Etapa 9:



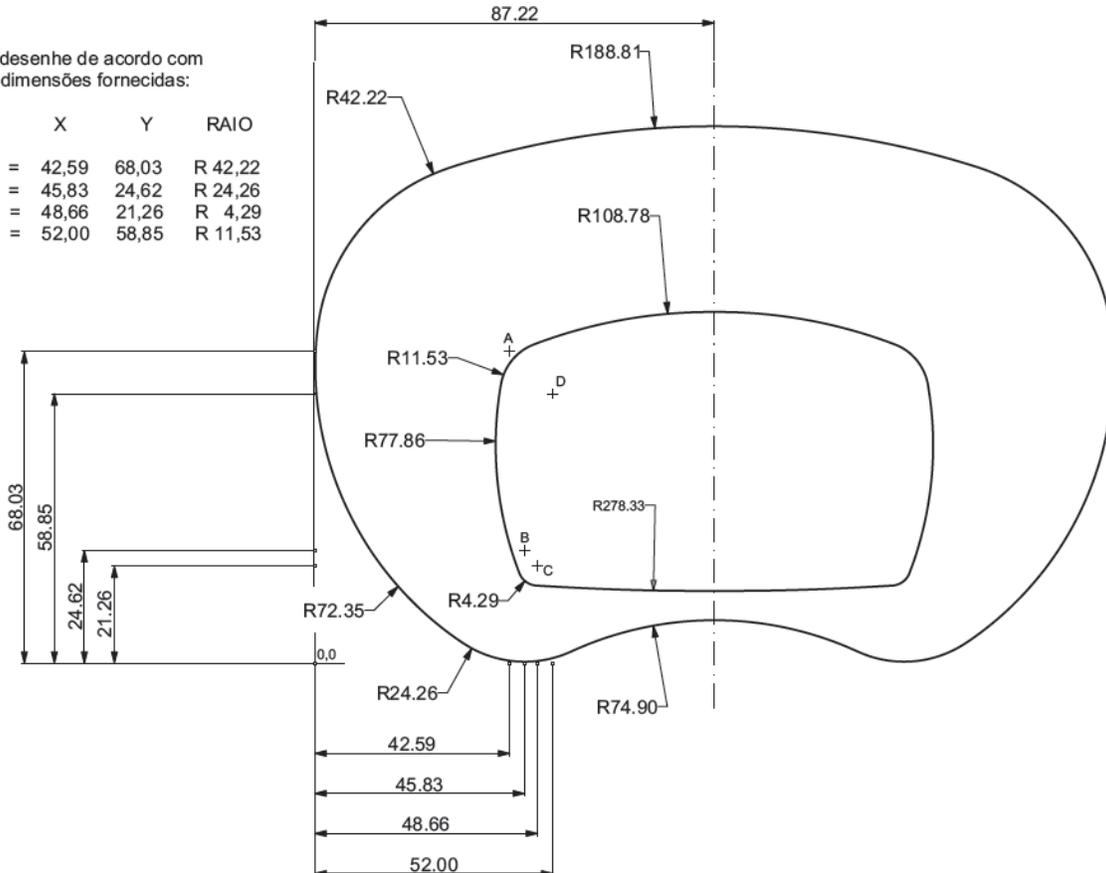
Através do **Layer Properties Manager** é possível, criar linhas, excluir linhas, selecionar qual linha está em uso.

Além do mais, cada layer pode ser escondido, congelado, travado, colorido, atribuir tipo de linha, alterar a espessura, etc.

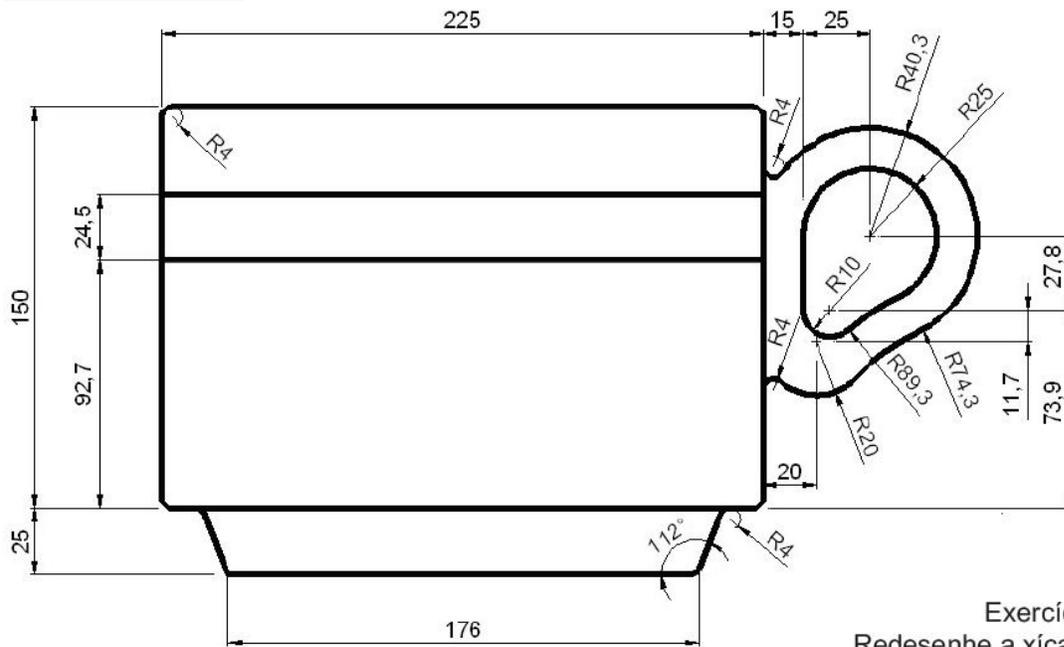
EXERCÍCIO Nº 7:

Redesenhe de acordo com as dimensões fornecidas:

	X	Y	RAIO
A =	42,59	68,03	R 42,22
B =	45,83	24,62	R 24,26
C =	48,66	21,26	R 4,29
D =	52,00	58,85	R 11,53



EXERCÍCIO Nº 8:



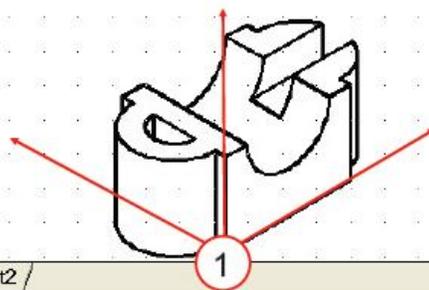
Exercício:
Redesenhe a xícara.
Medidas em mm.

EXERCÍCIO Nº 9:

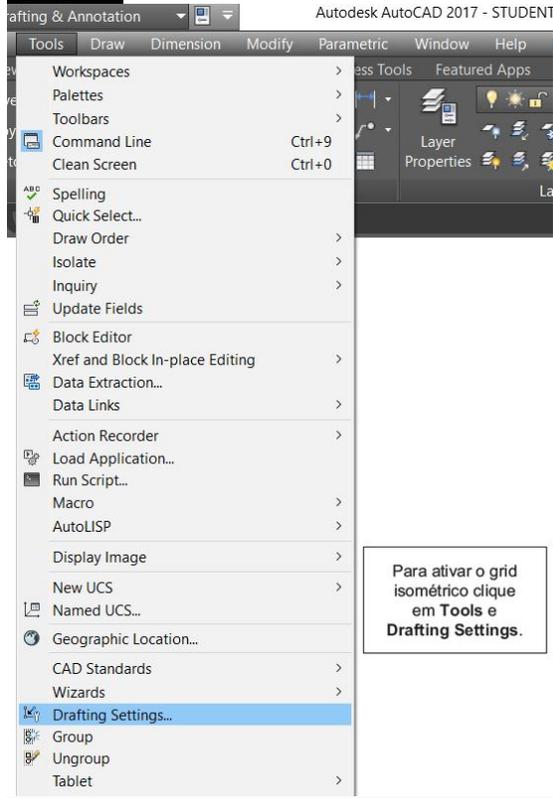
A Isométrica é uma perspectiva paralela. As linhas que se encontram no tri-eixo ortogonal (1) têm as mesmas medidas encontradas nas vistas ortogonais.

Iso + métrica = mesma medida

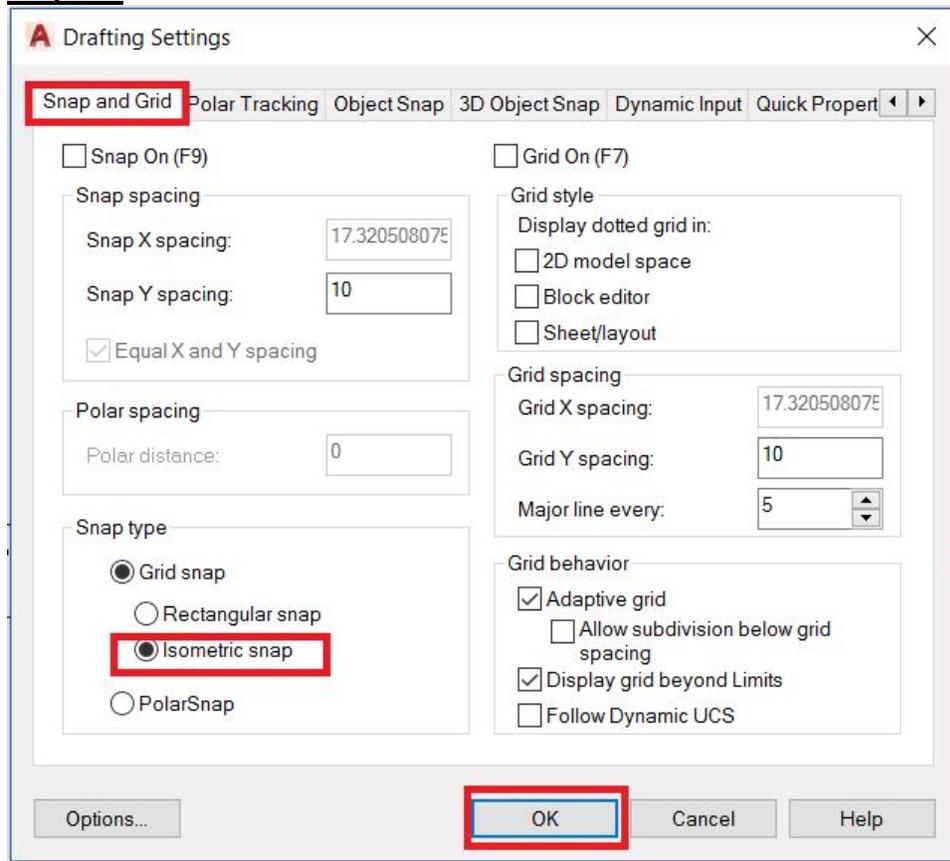
Os eixos X e Y se afastam da origem a 30 graus em direções opostas.



Etapa 1:

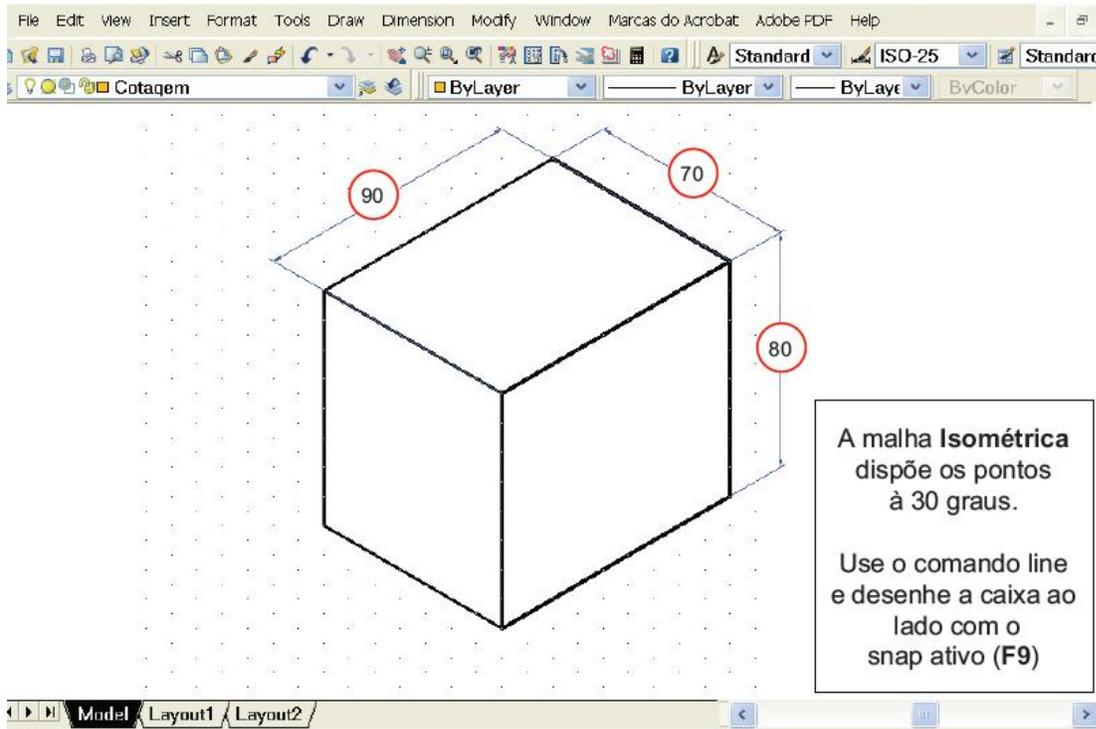


Etapa 2:

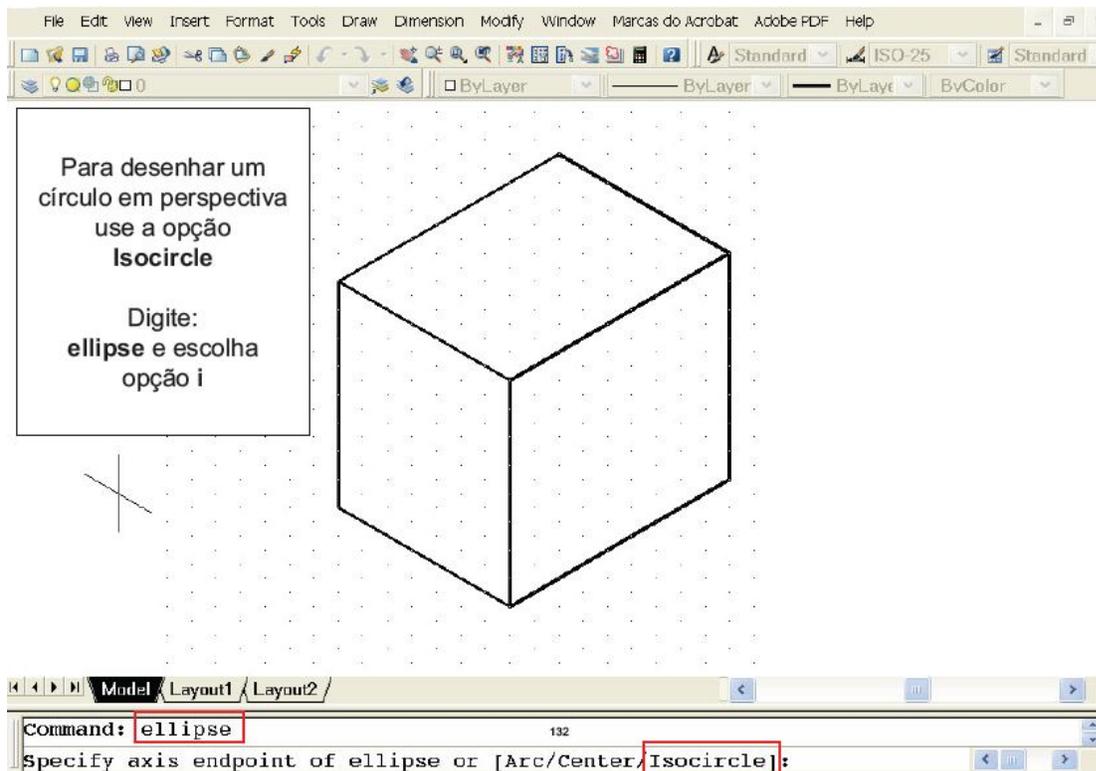


Material Instrucional Técnico de Apoio às Disciplinas de Desenho Técnico e correlacionadas Nível Tecnólogos e Engenharias

Etapa 3:



Etapa 4:



Etapa 5:

File Edit View Insert Format Tools Draw Dimension Modify Window Marcas do Acrobat Adobe PDF Help

Standard ISO-25 Standard

ByLayer ByLayer ByLayer BvColor

Use uma diagonal auxiliar para determinar o centro da face.

Ative MIDpoint no OSNAP ou digite MID para achar o ponto central.

Neste exemplo não é necessário usar uma medida exata para o círculo.

Model Layout1 Layout2

Specify radius of isocircle or [Diameter]:

Command: 133

Etapa 6:

File Edit View Insert Format Tools Draw Dimension Modify Window Marcas do Acrobat Adobe PDF Help

Standard ISO-25 Standard

ByLayer ByLayer ByLayer BvColor

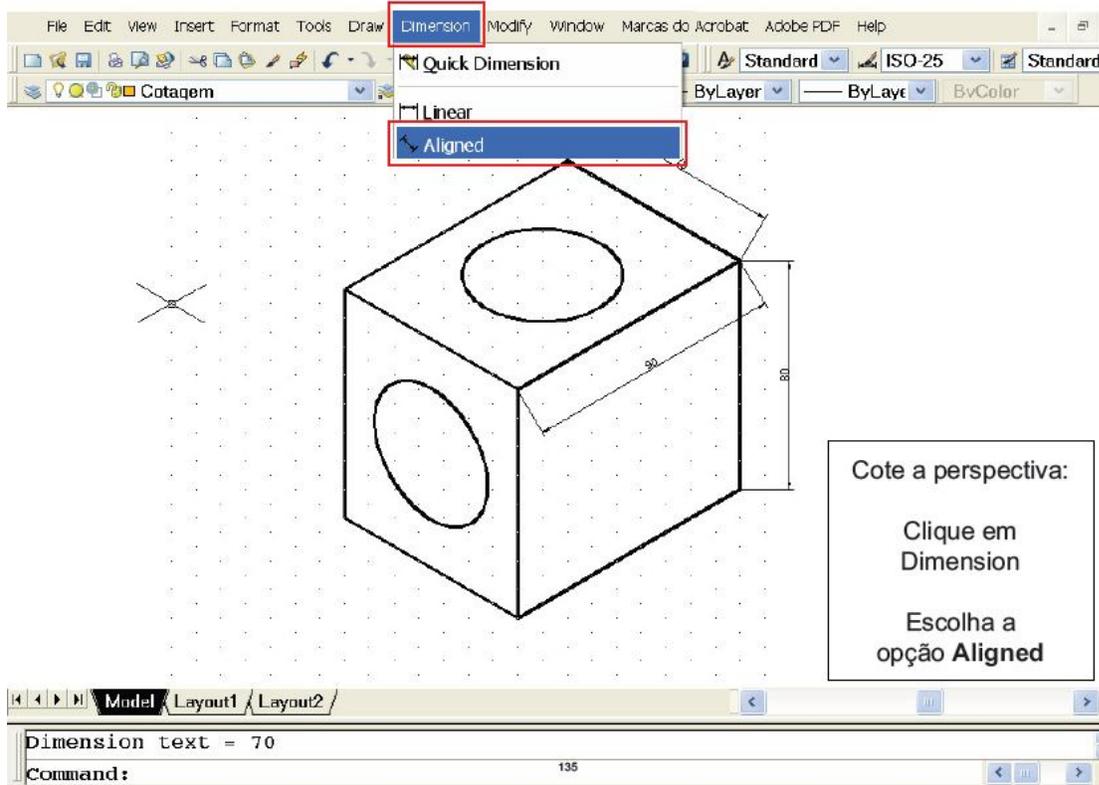
Se necessário, pressione F5 para alterar novamente o eixo isométrico.

Desenhe um círculo na outra face.

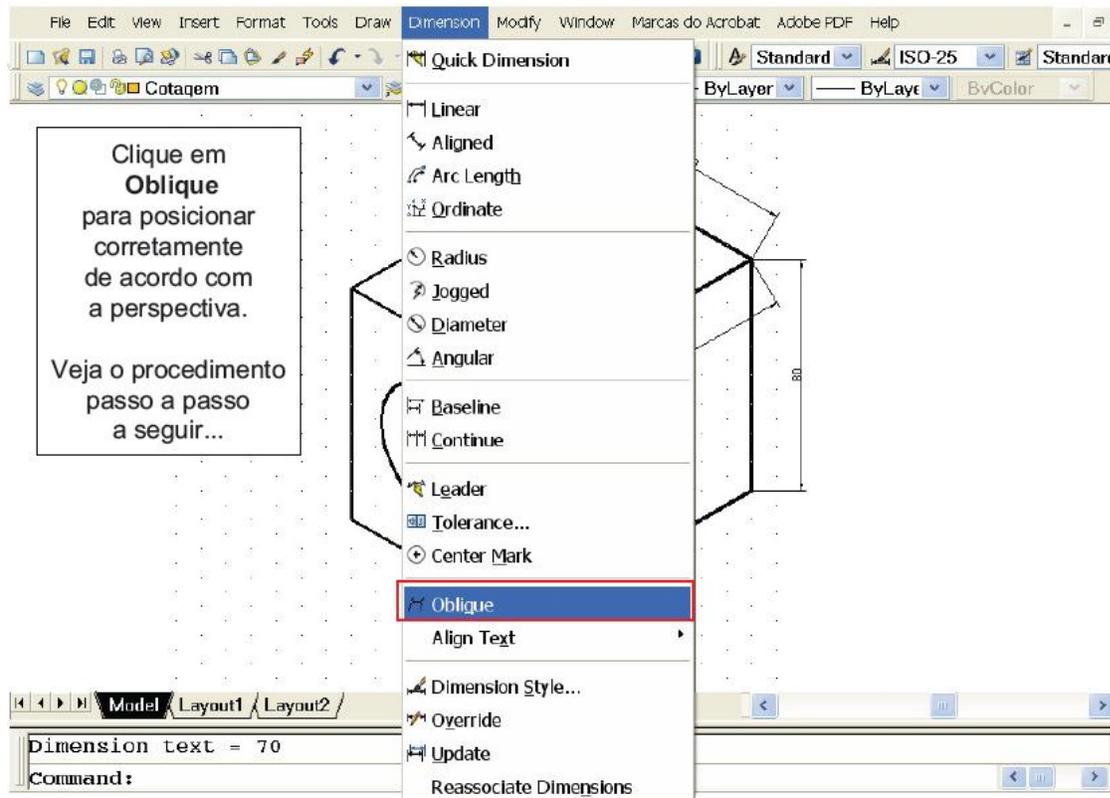
Specify radius of isocircle or [Diameter]:

Command: 134

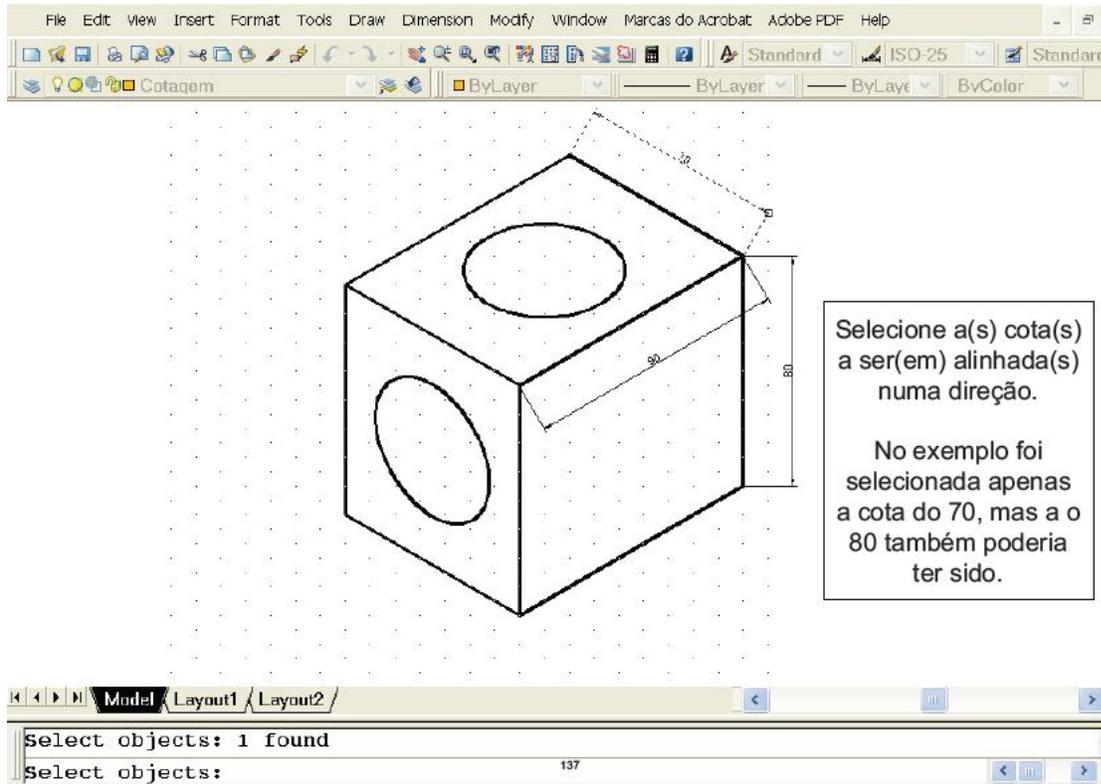
Etapa 7:



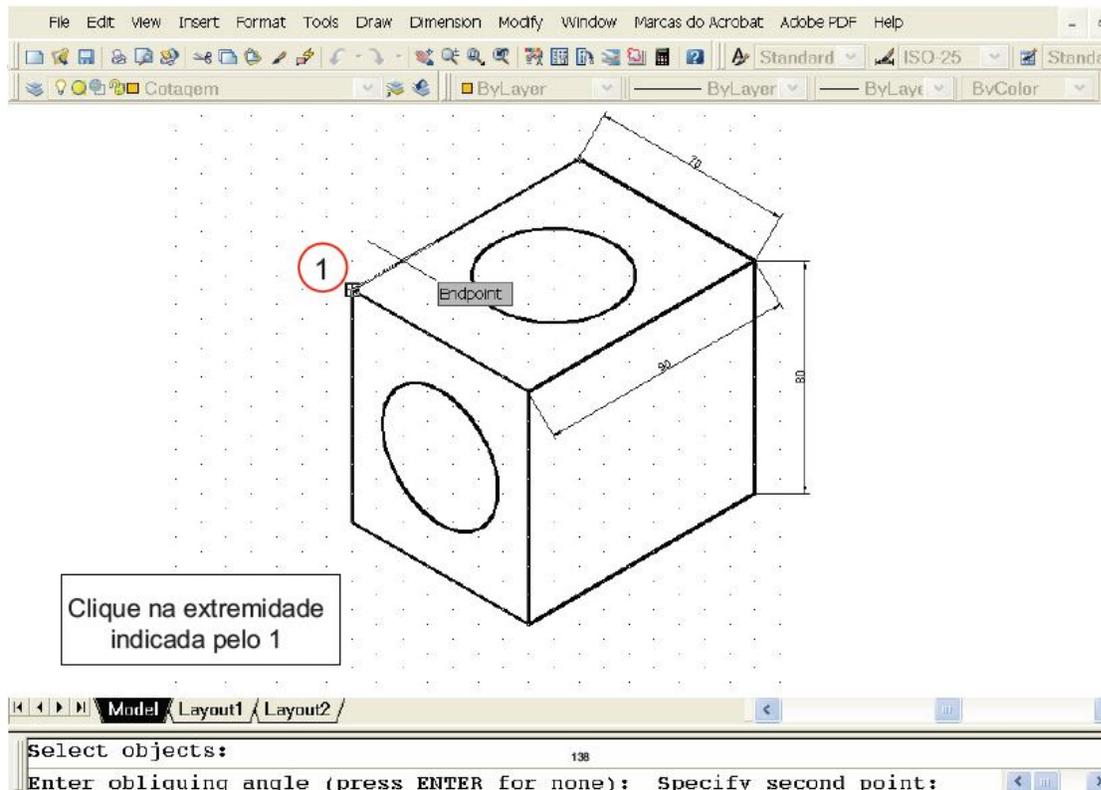
Etapa 8:



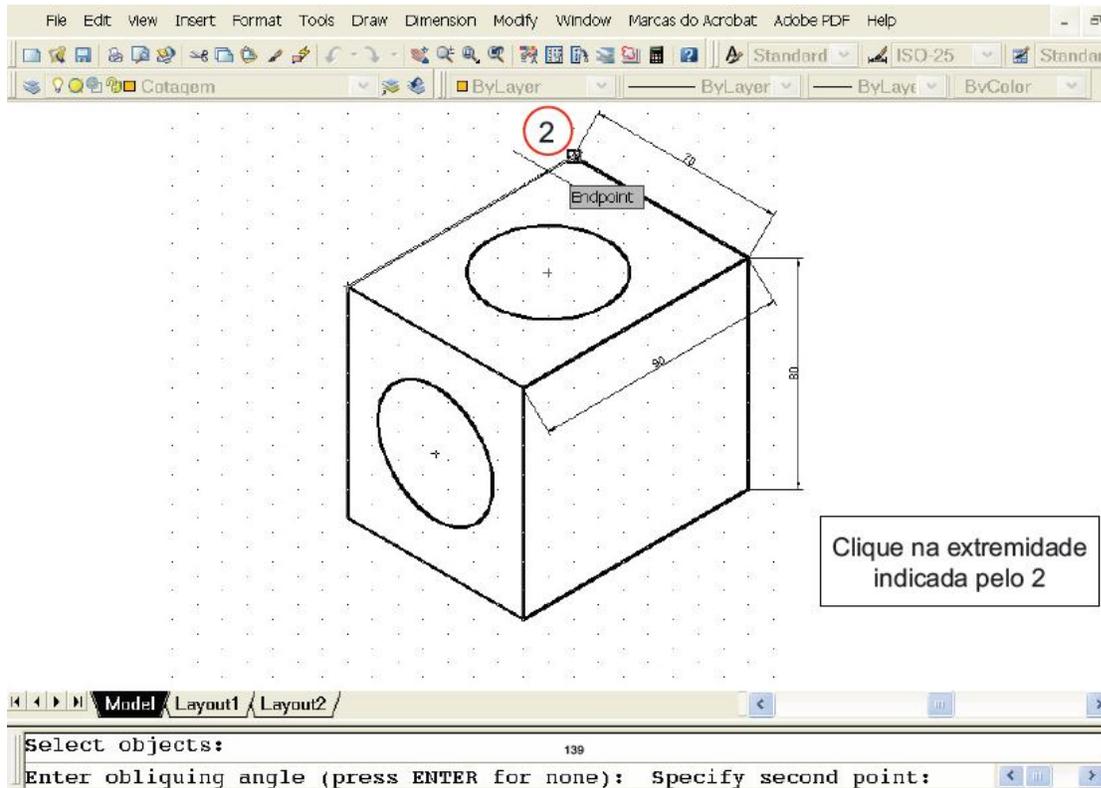
Etapa 9:



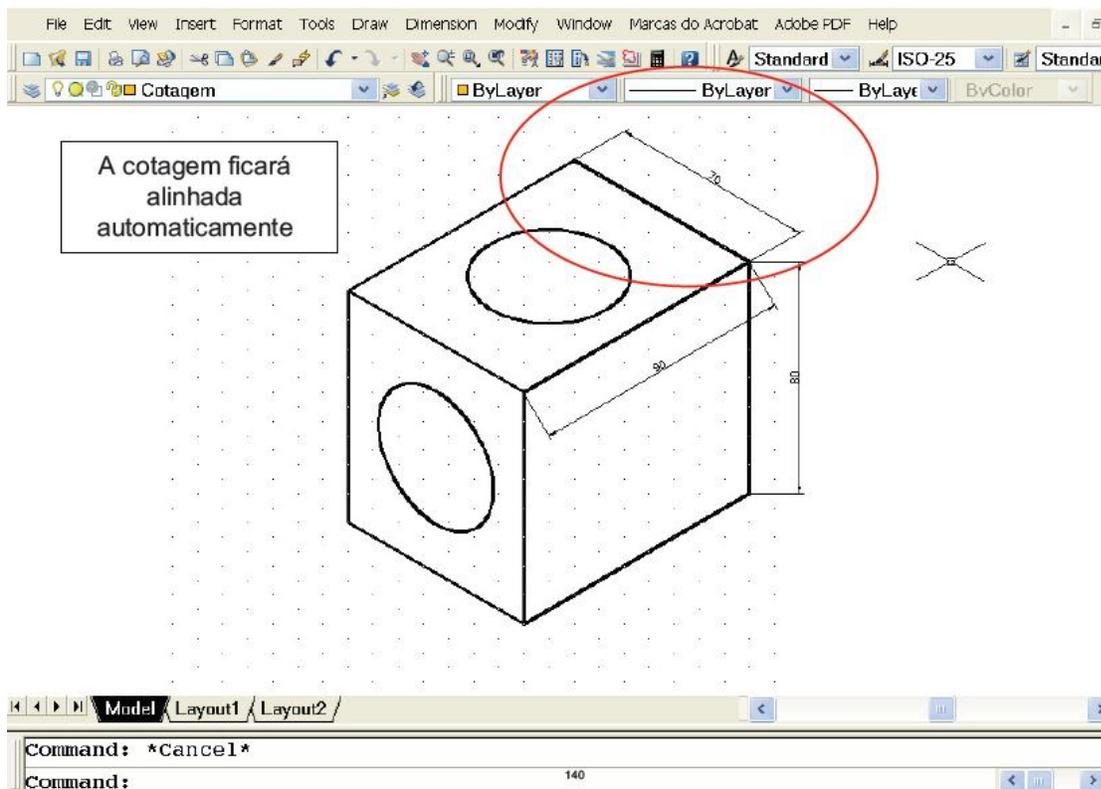
Etapa 10:



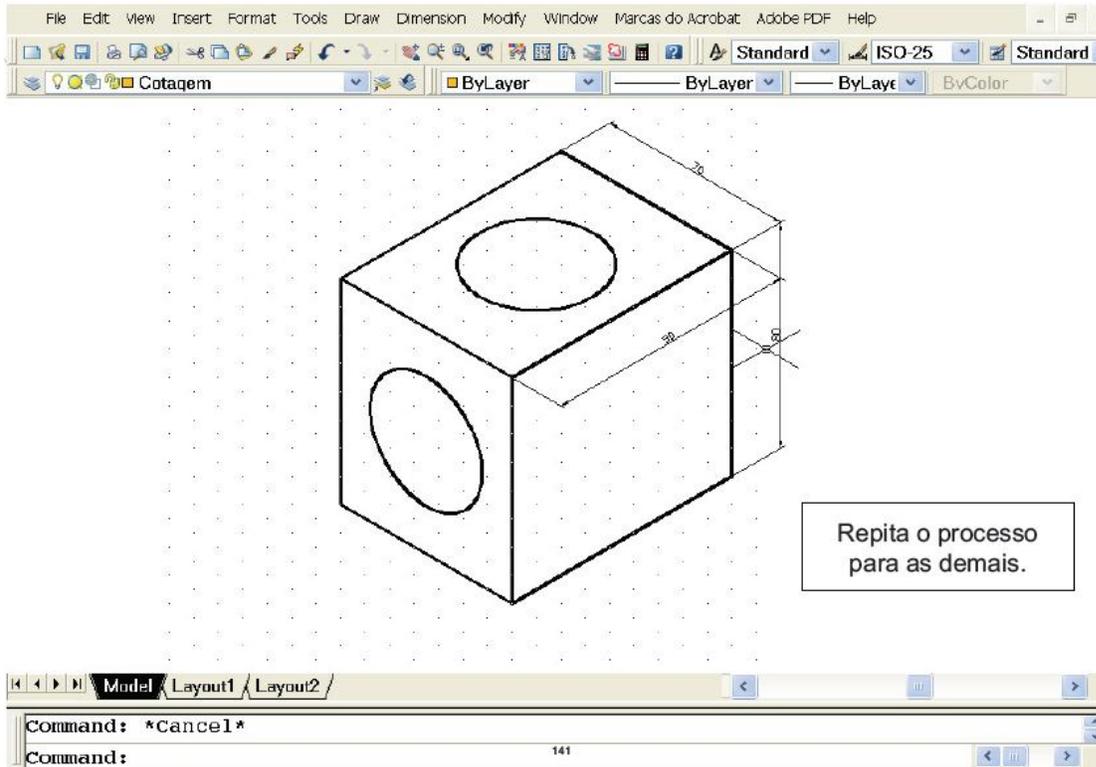
Etapa 11:



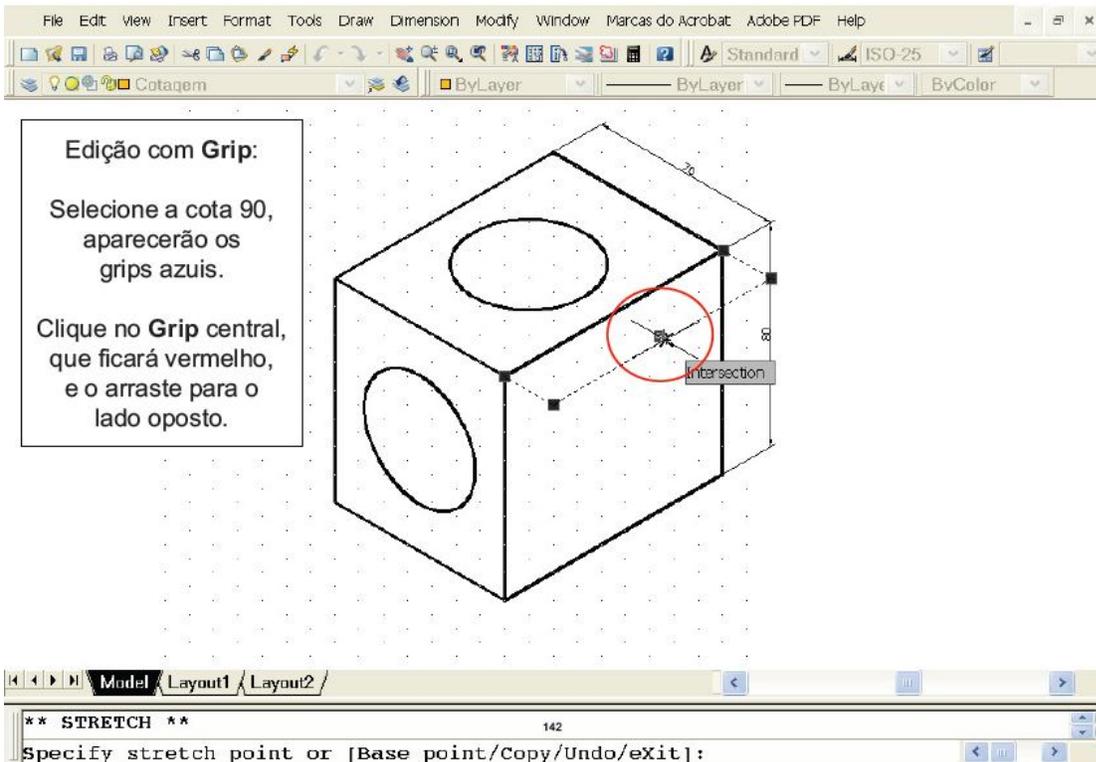
Etapa 12:



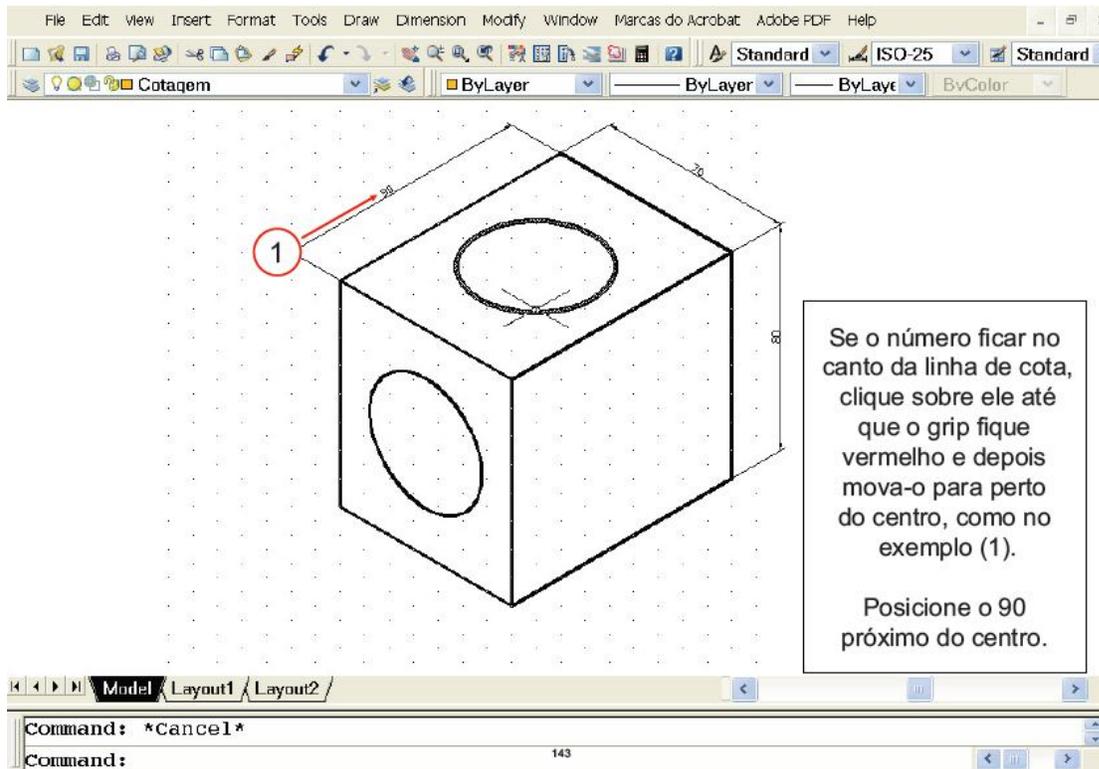
Etapa 13:



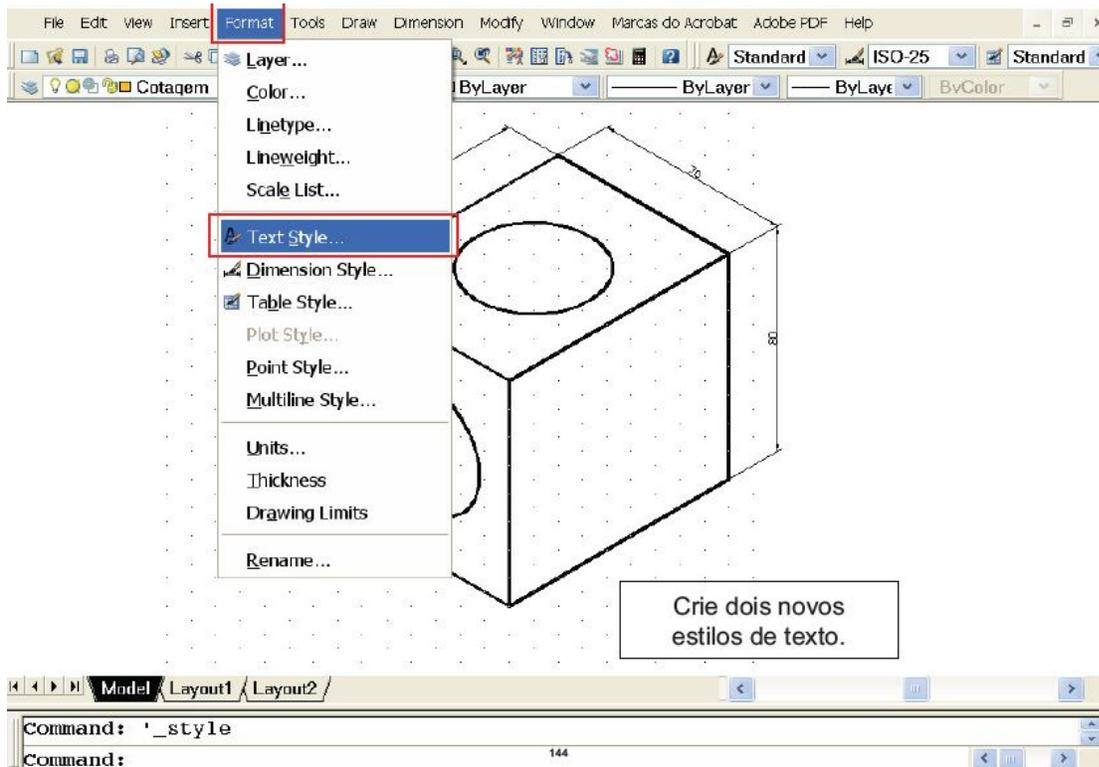
Etapa 14:



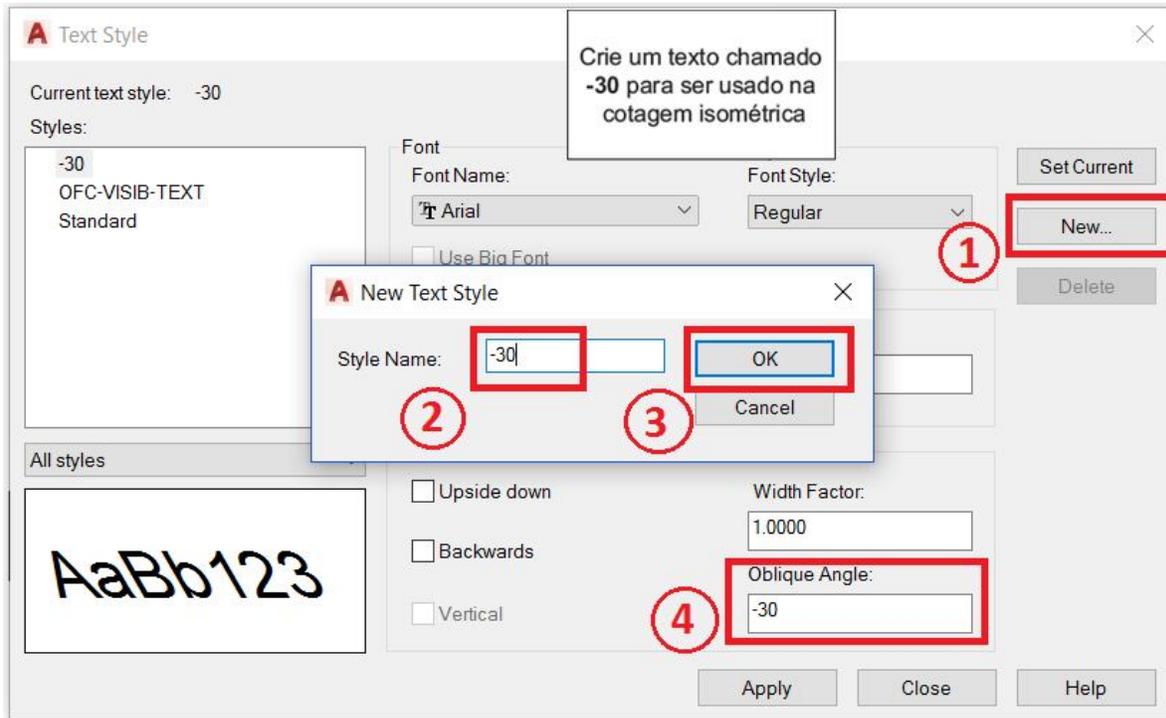
Etapa 15:



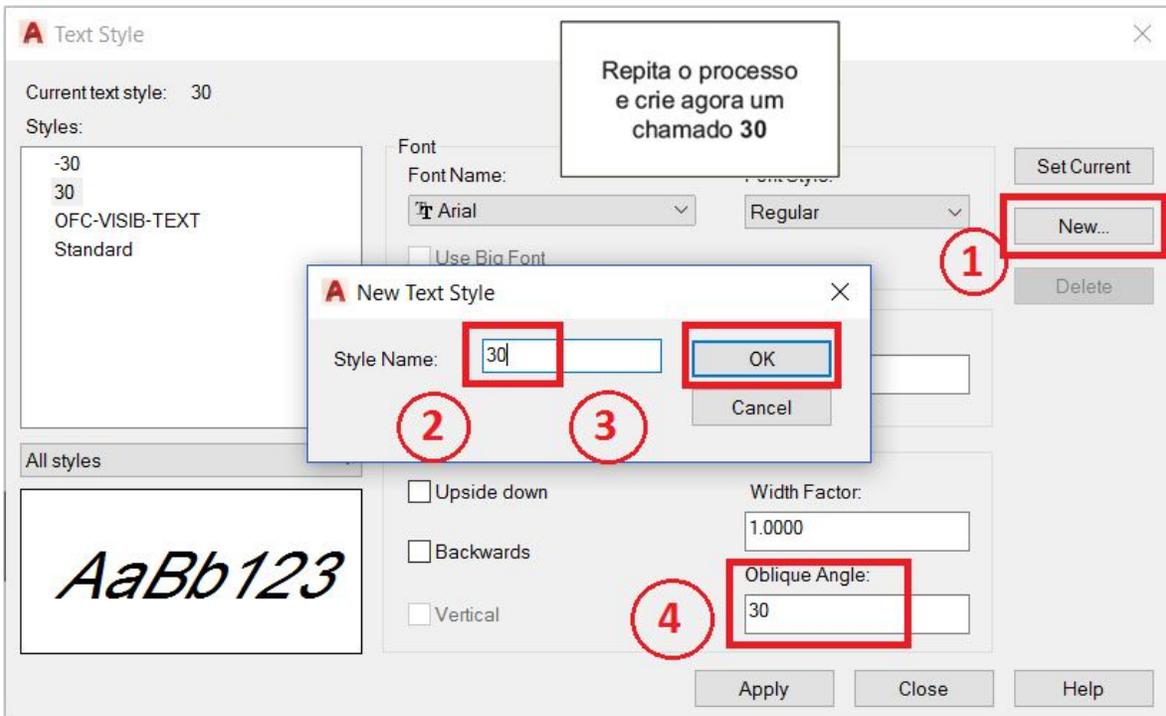
Etapa 16:



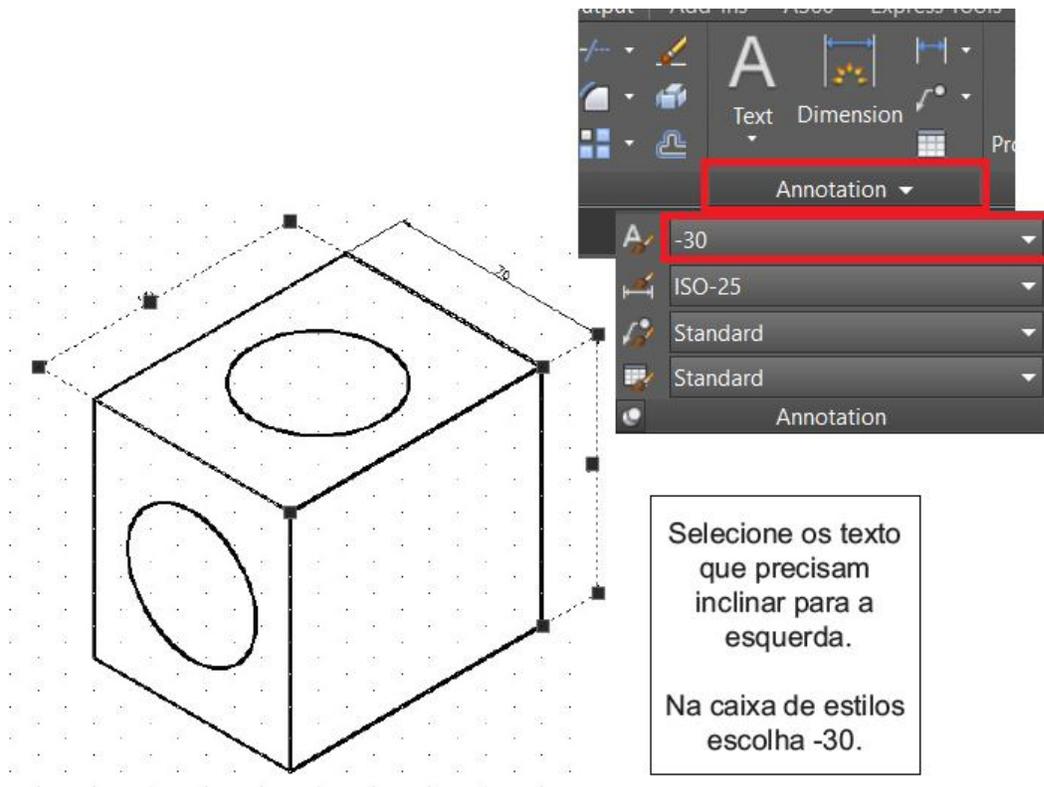
Etapa 17:



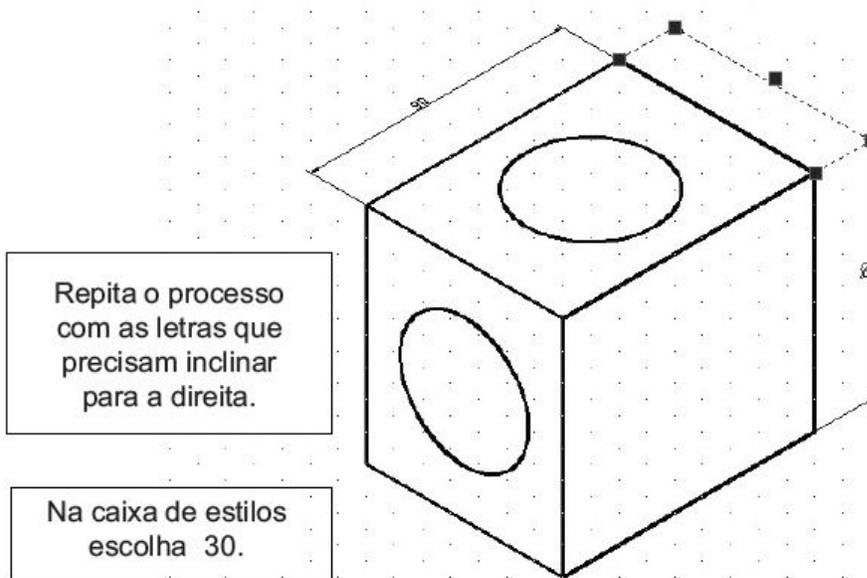
Etapa 18:



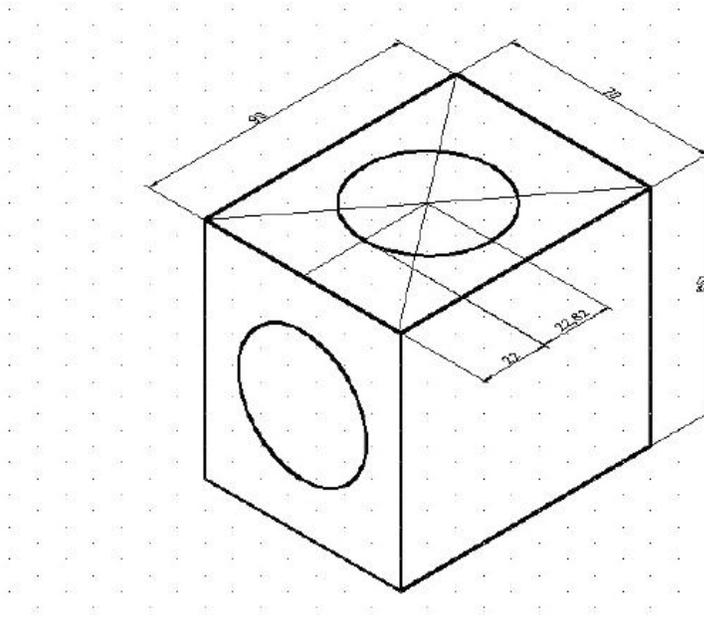
Etapa 19:



Etapa 20:

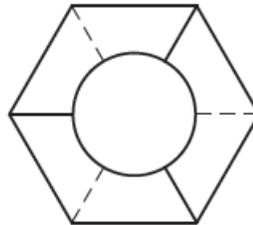
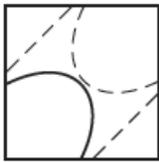


Etapa 21:



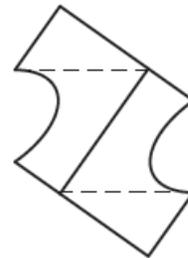
Use linhas auxiliares para cotar os isocírculos e os seus centros.

PERSPECTIVAS:

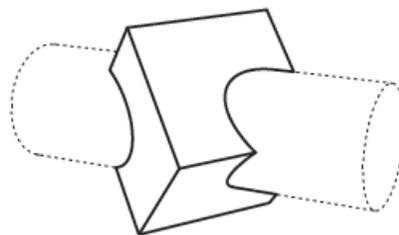


A IMPORTÂNCIA DA PERSPECTIVA

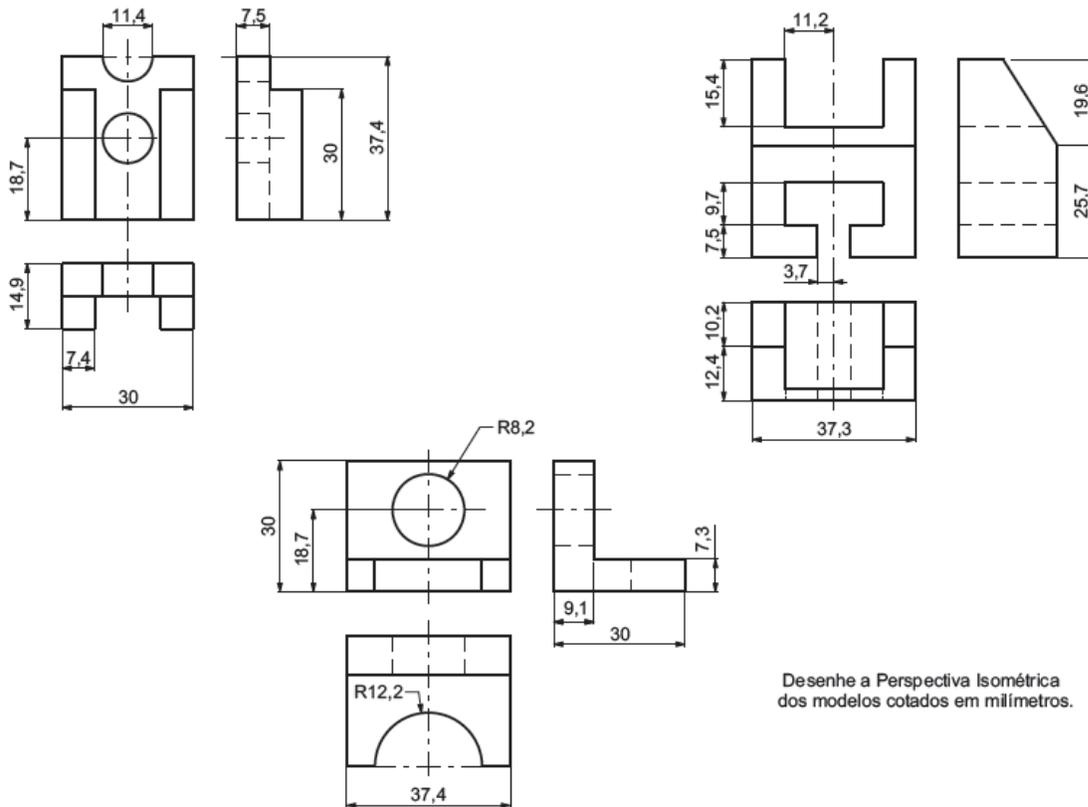
Existem objetos que não podem ser bem representados através de vistas, cortes ou seções. Na realidade, é a interpretação do modelo que fica comprometida. Nesses casos uma simples perspectiva é muito útil, principalmente para a apresentação pública. Em termos técnicos os arquivos digitais estão substituindo as folhas impressas.



O modelo é perfurado por um cilindro cujo eixo está situado na diagonal do cubo.

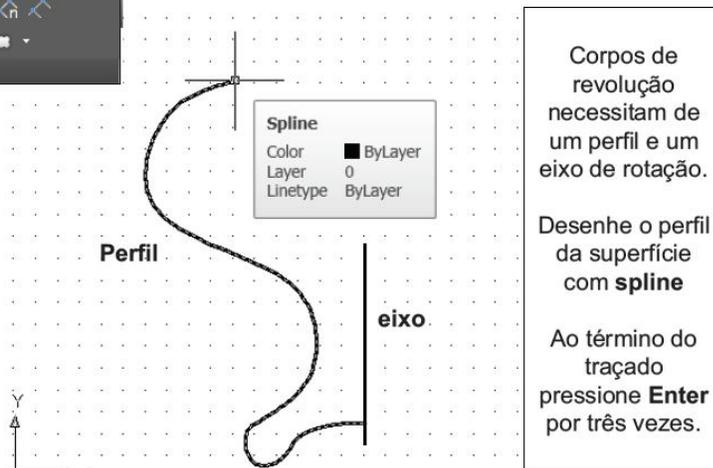
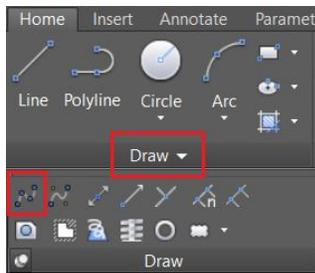


EXERCÍCIO Nº 10:



EXERCÍCIO Nº 11:

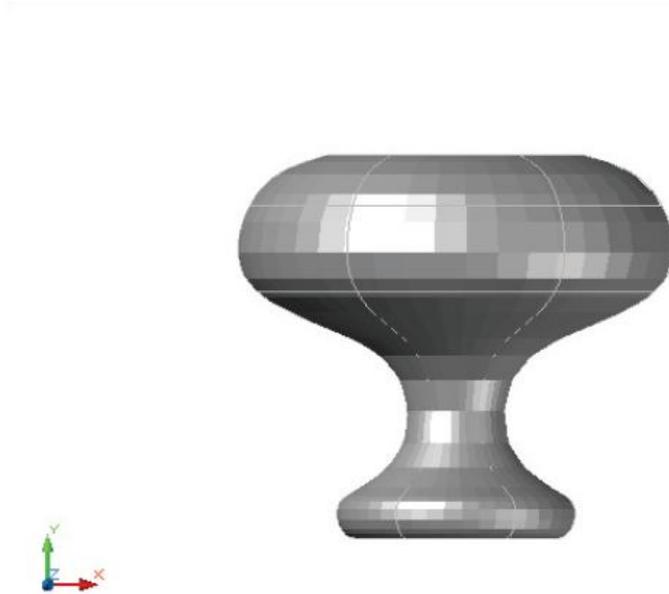
Etapa 1:



Corpos de revolução necessitam de um perfil e um eixo de rotação.

Desenhe o perfil da superfície com **spline**

Ao término do traçado pressione **Enter** por três vezes.



Para criar o objeto use o comando **revolve**.

Command: revolve

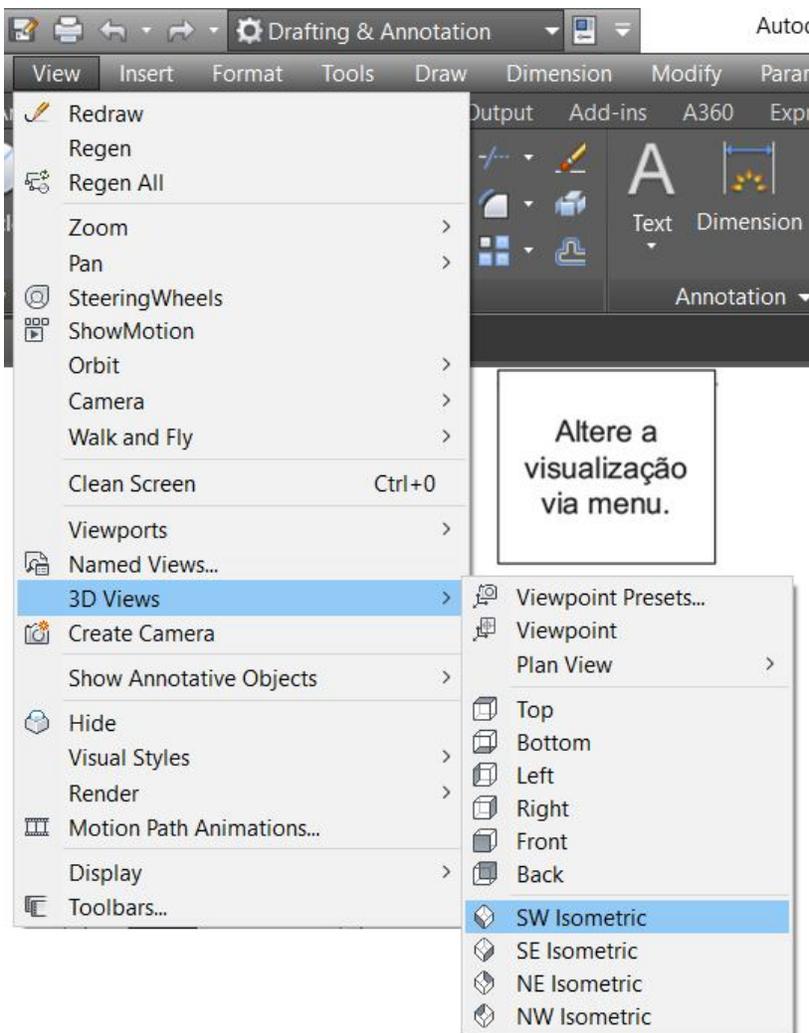
Select objects to revolve: clique no perfil

Enter

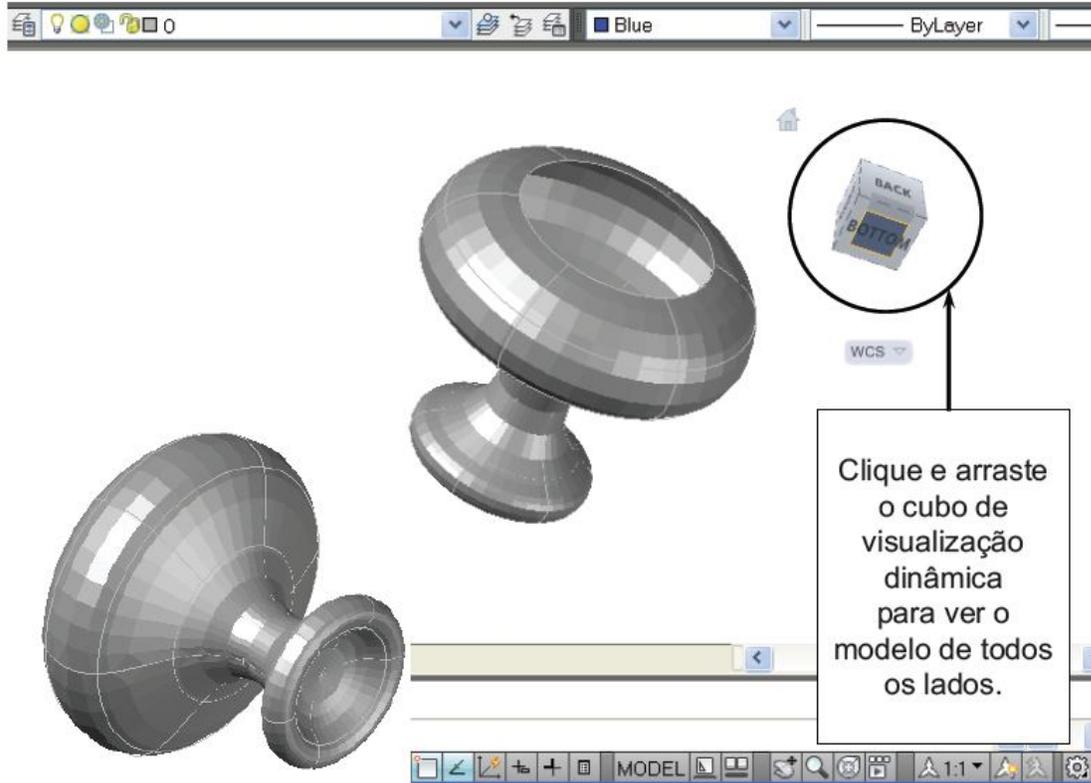
Clique em dois pontos do eixo.

360
(para uma volta inteira)

Etapa 2:

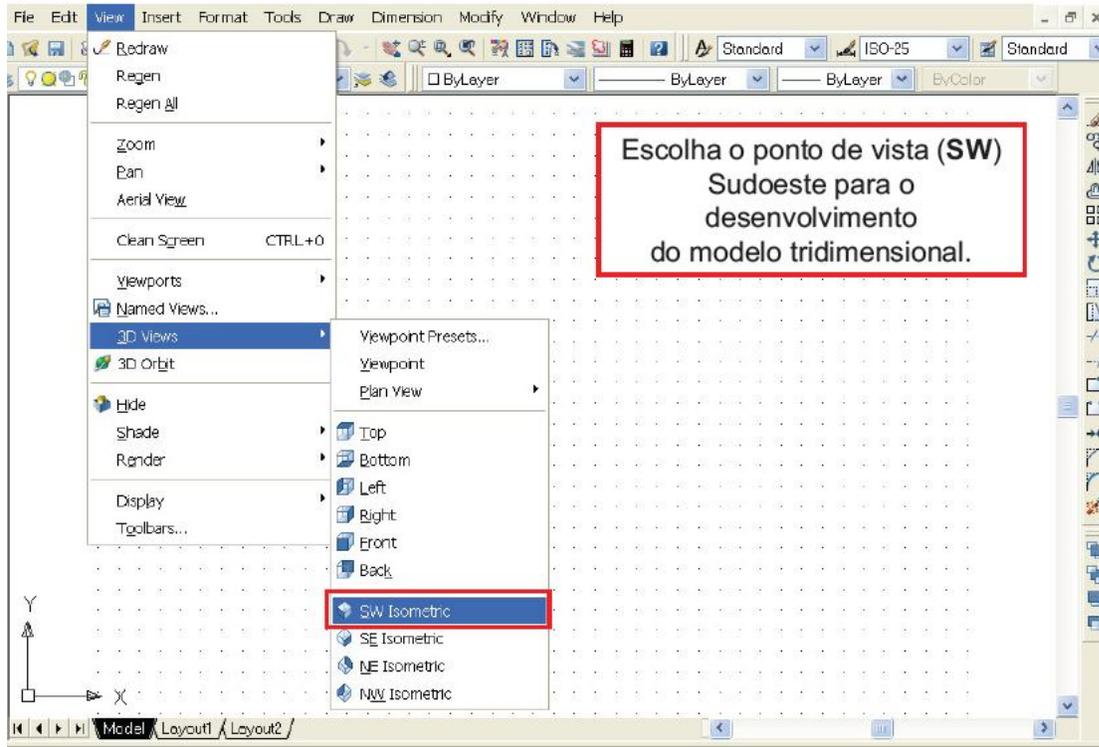


Etapa 3:

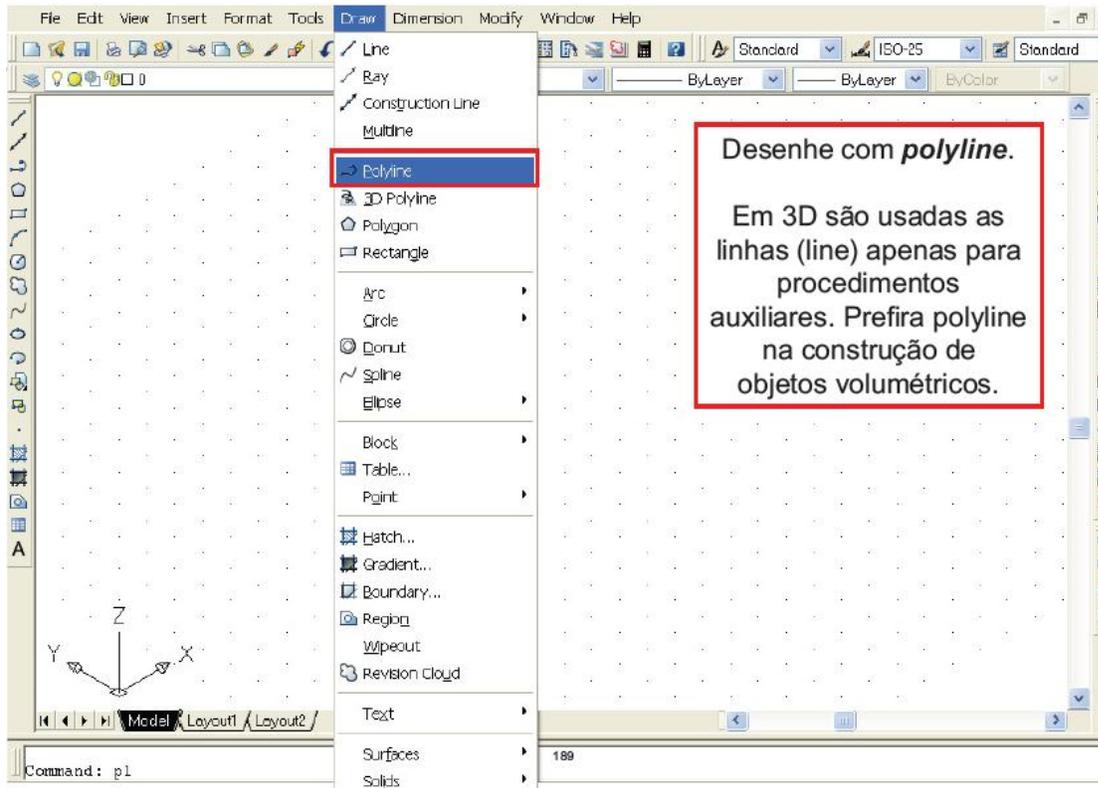


EXERCÍCIO Nº 12:

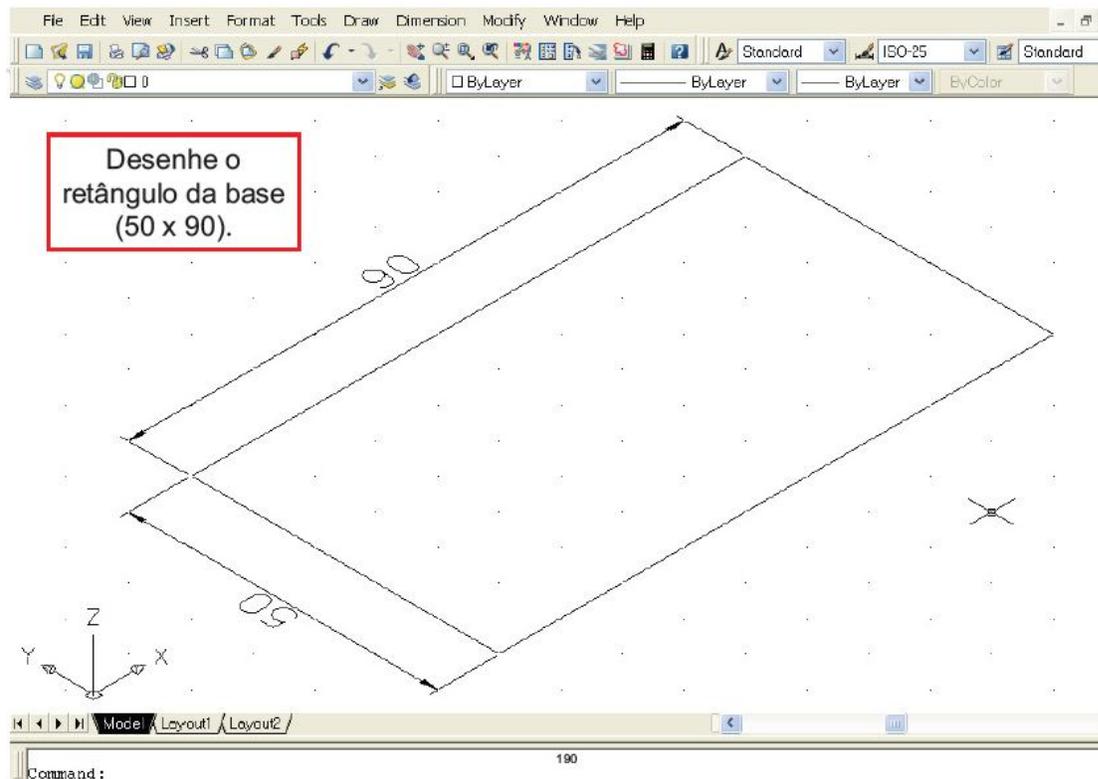
Etapa 1:



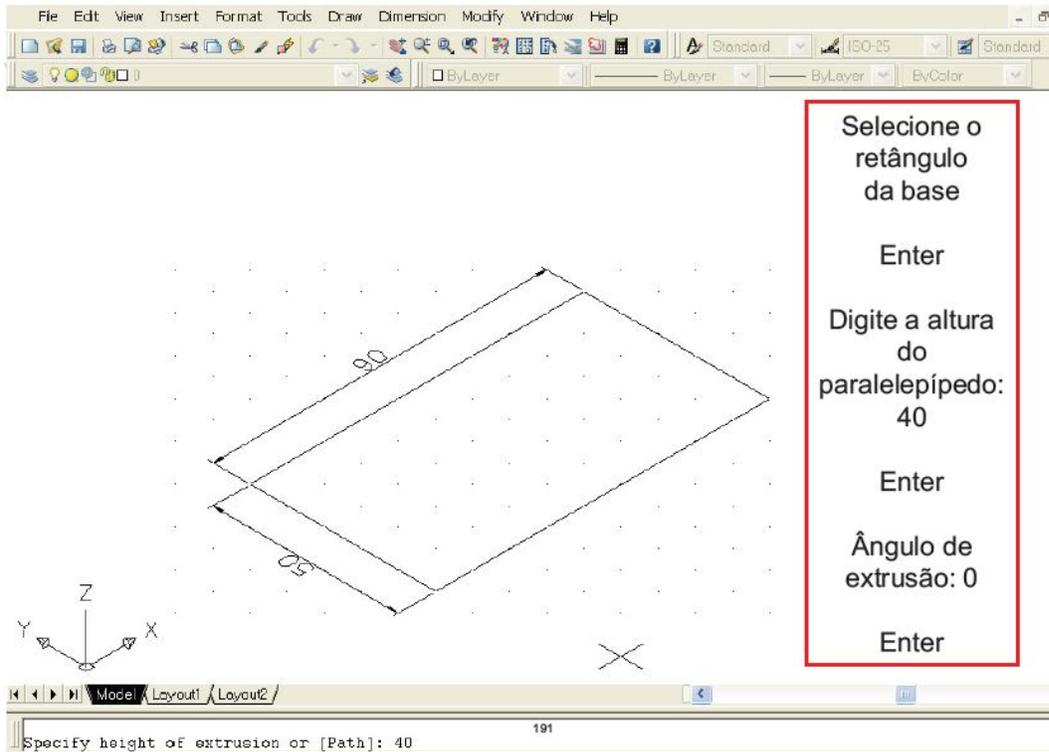
Etapa 2:



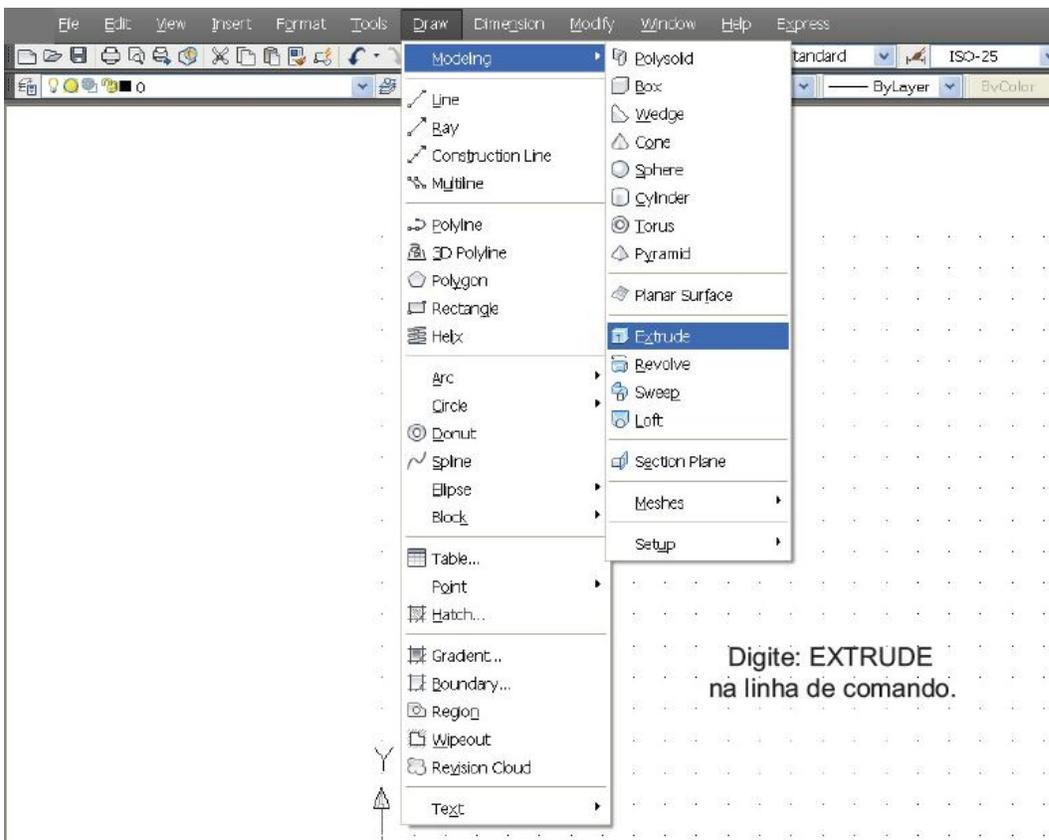
Etapa 3:



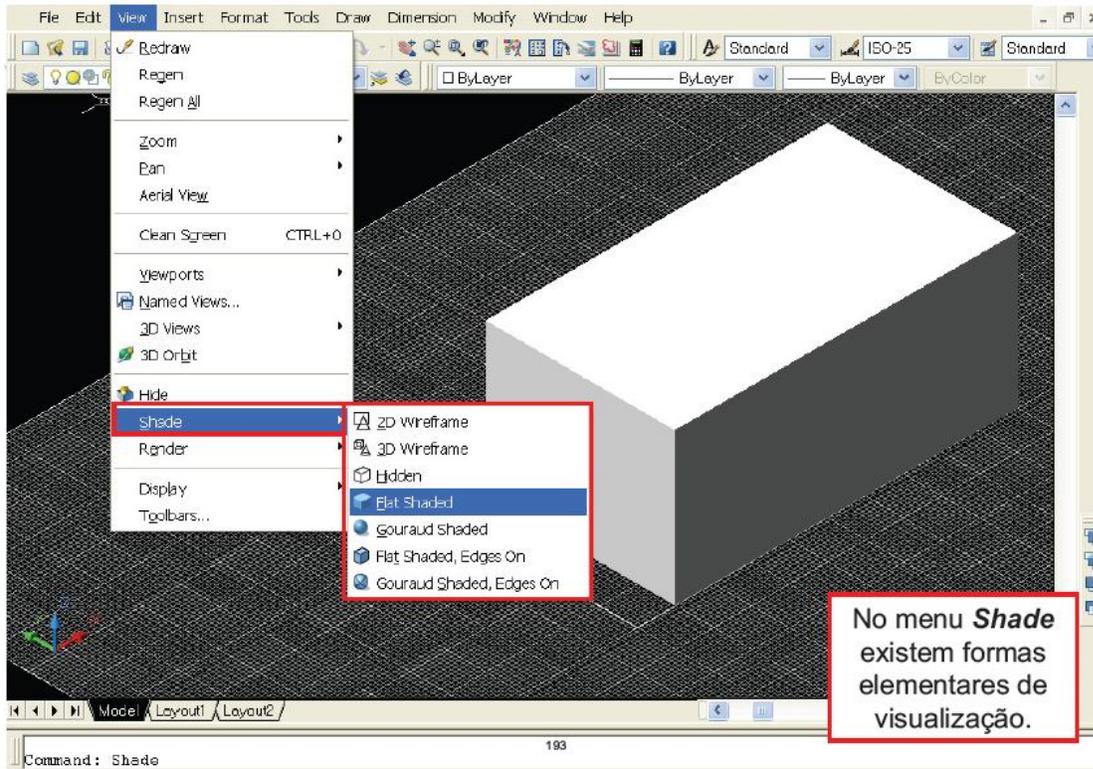
Etapa 4:



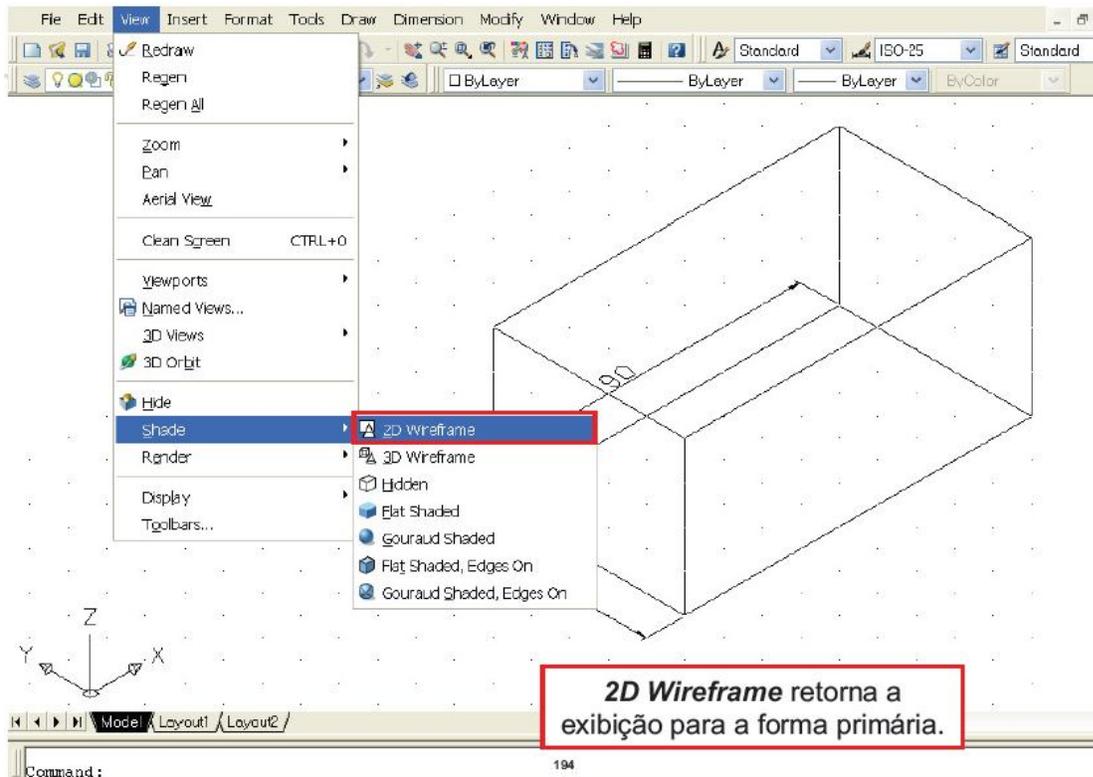
Etapa 5:



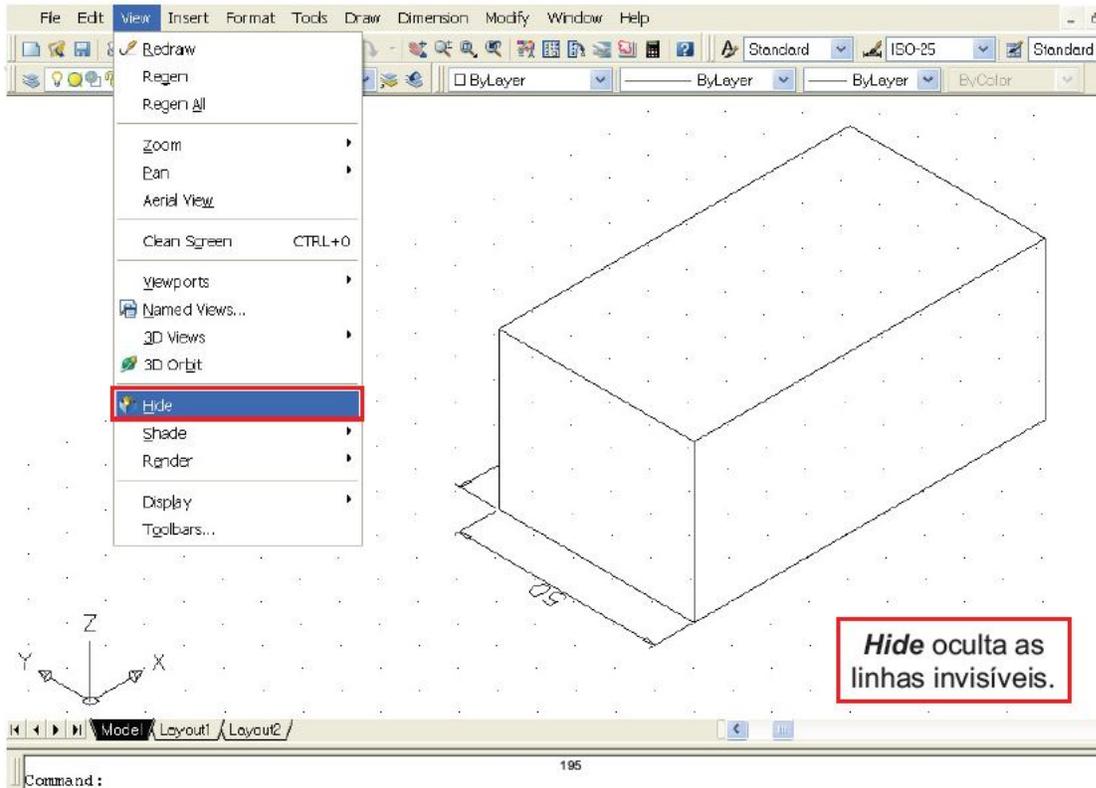
Etapa 6:



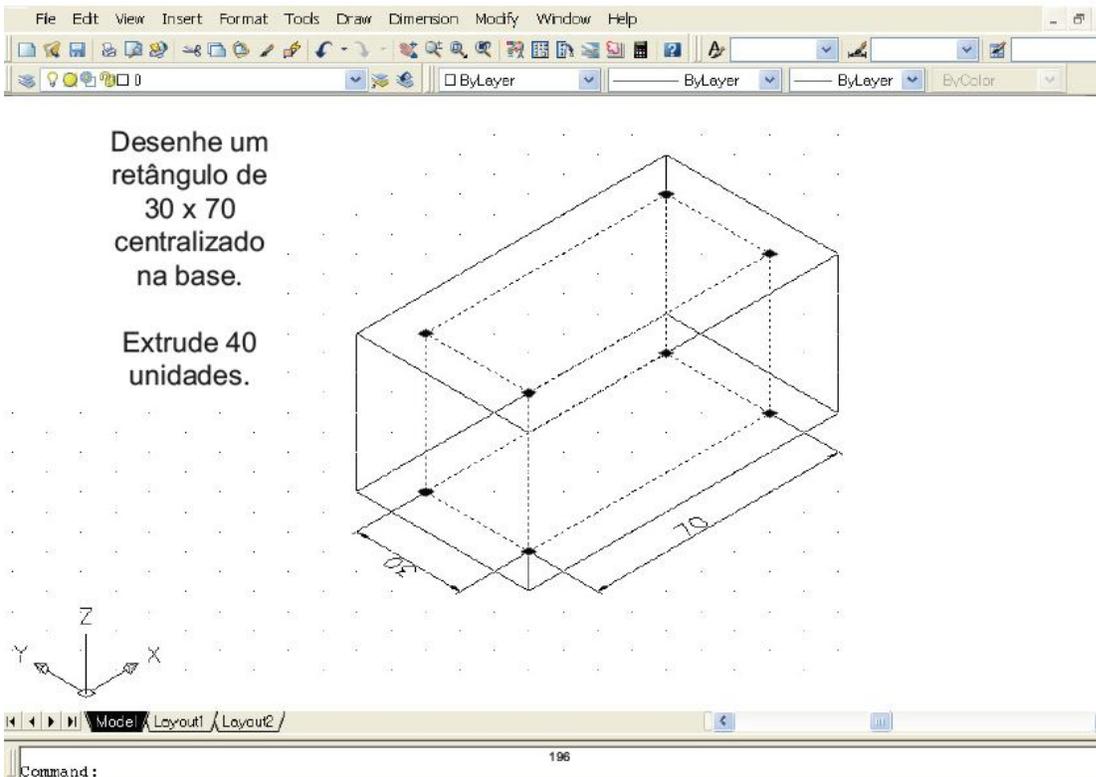
Etapa 7:



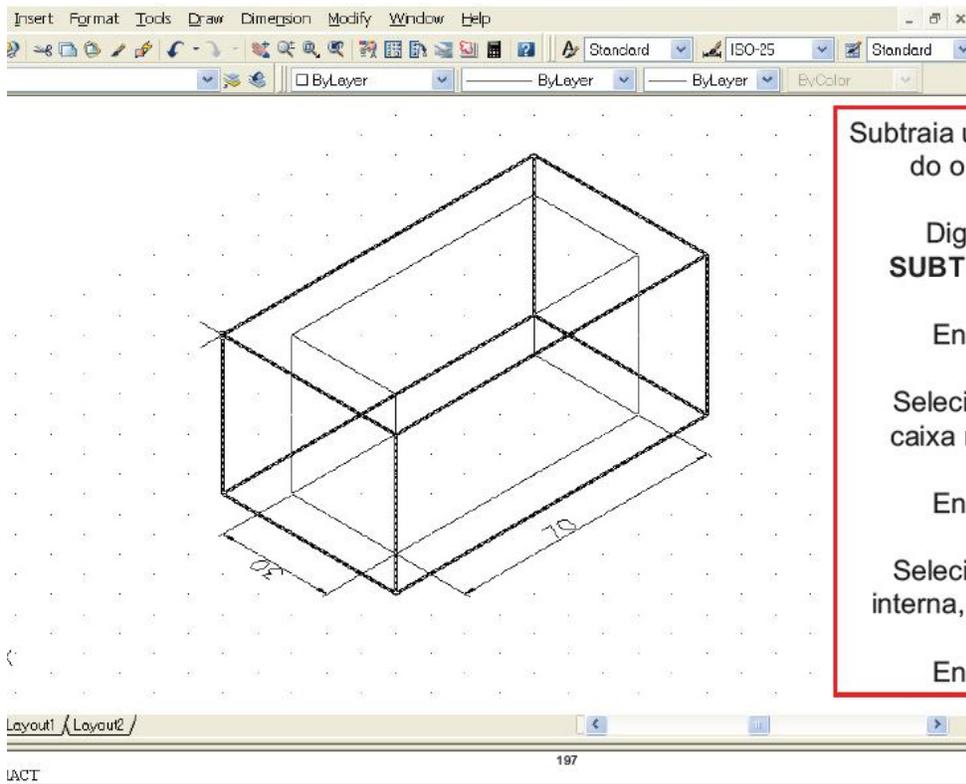
Etapa 8:



Etapa 9:



Etapa 10:



Subtraia um sólido do outro.

Digite:
SUBTRACT

Enter

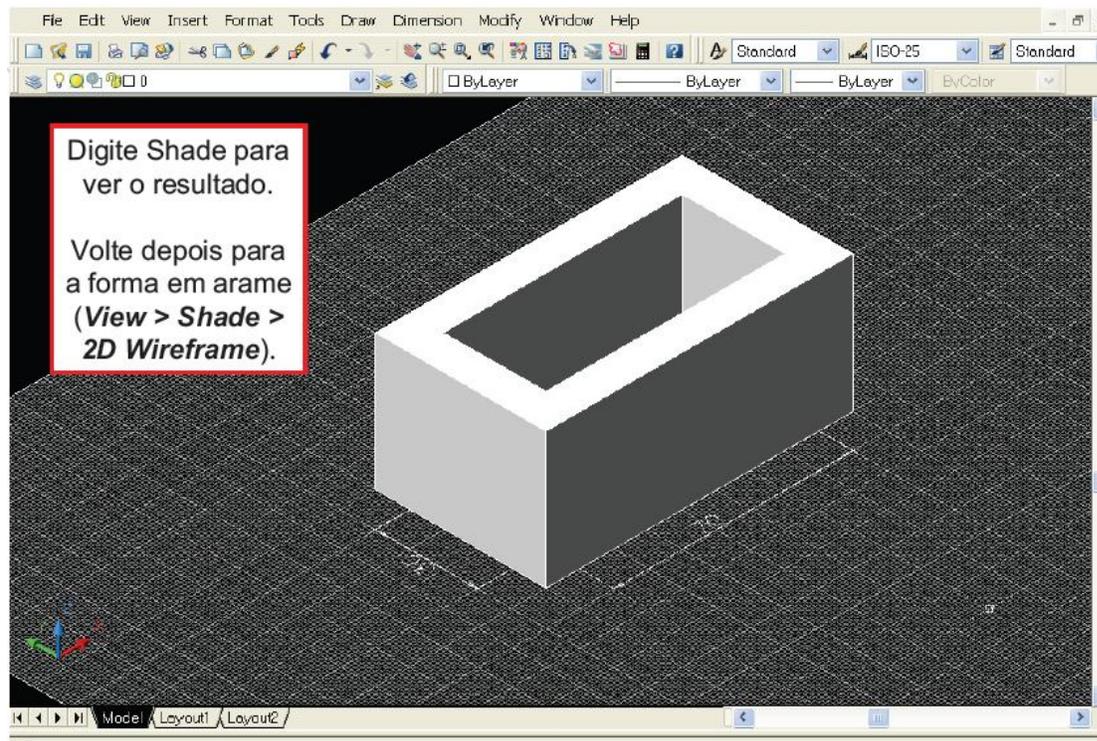
Selecione a caixa maior.

Enter

Selecione a interna, menor.

Enter

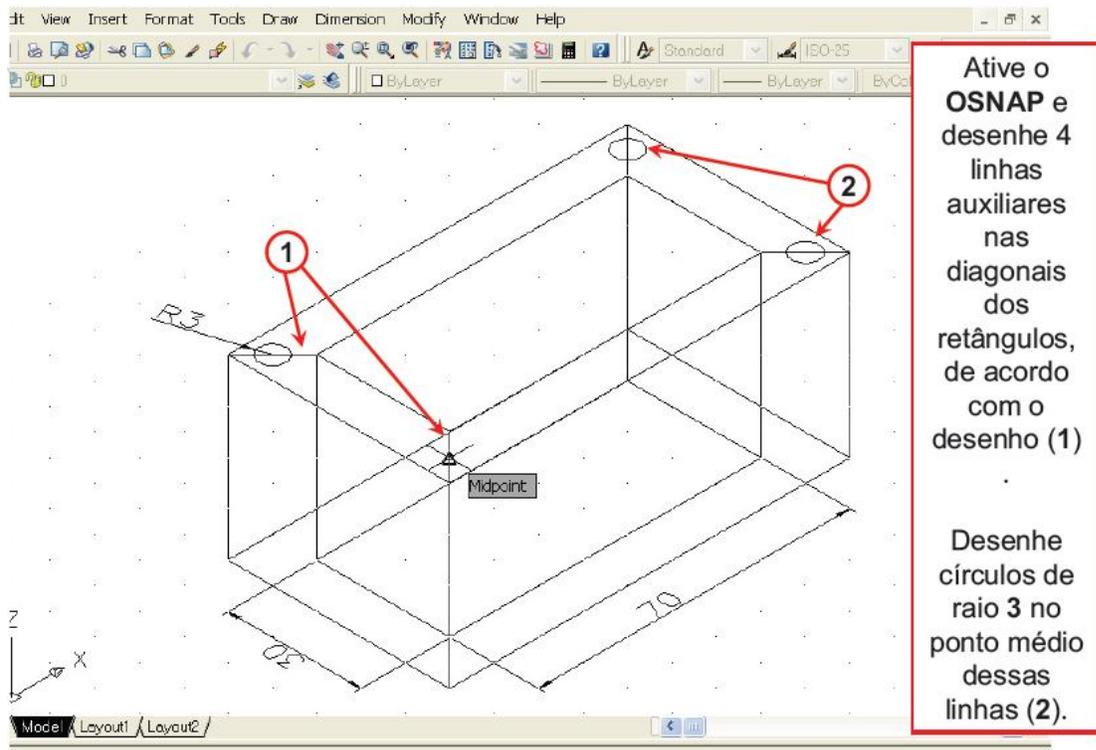
Etapa 11:



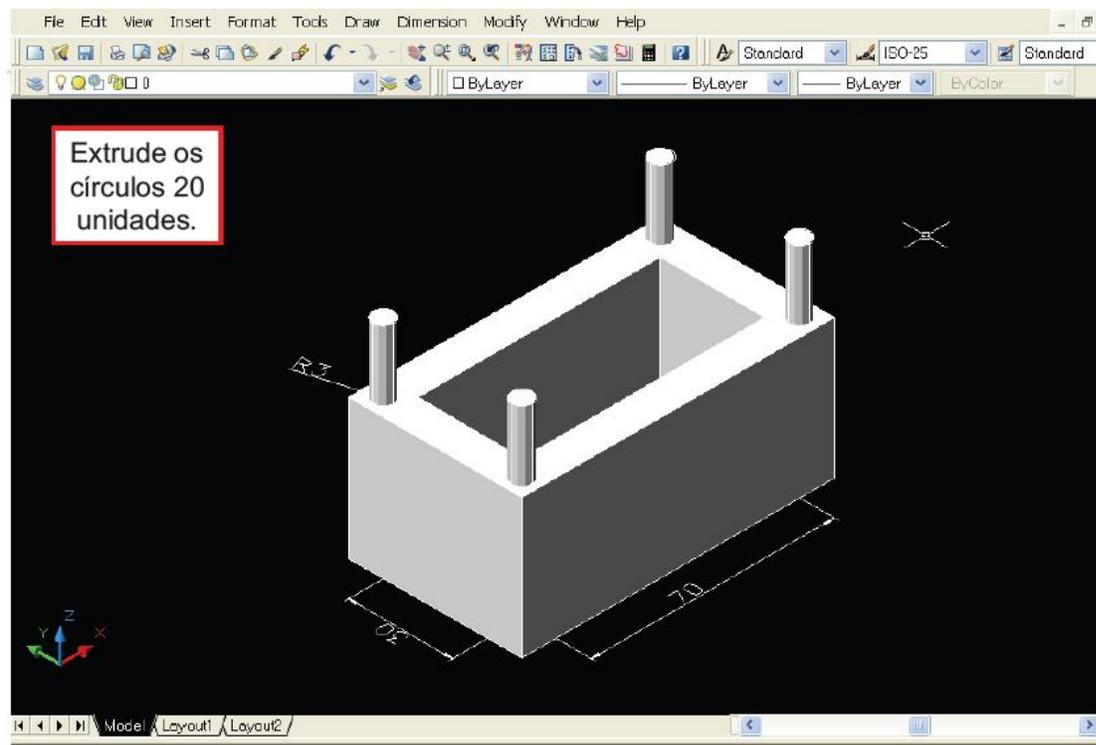
Digite Shade para ver o resultado.

Volte depois para a forma em arame (**View > Shade > 2D Wireframe**).

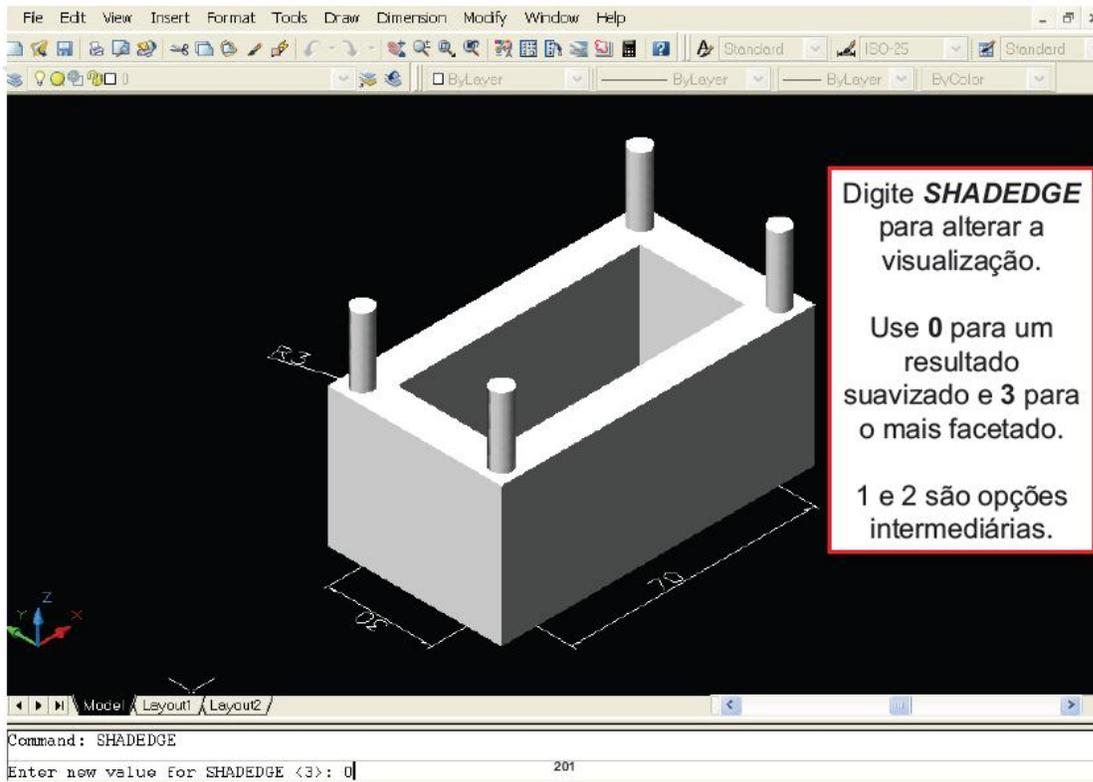
Etapa 12:



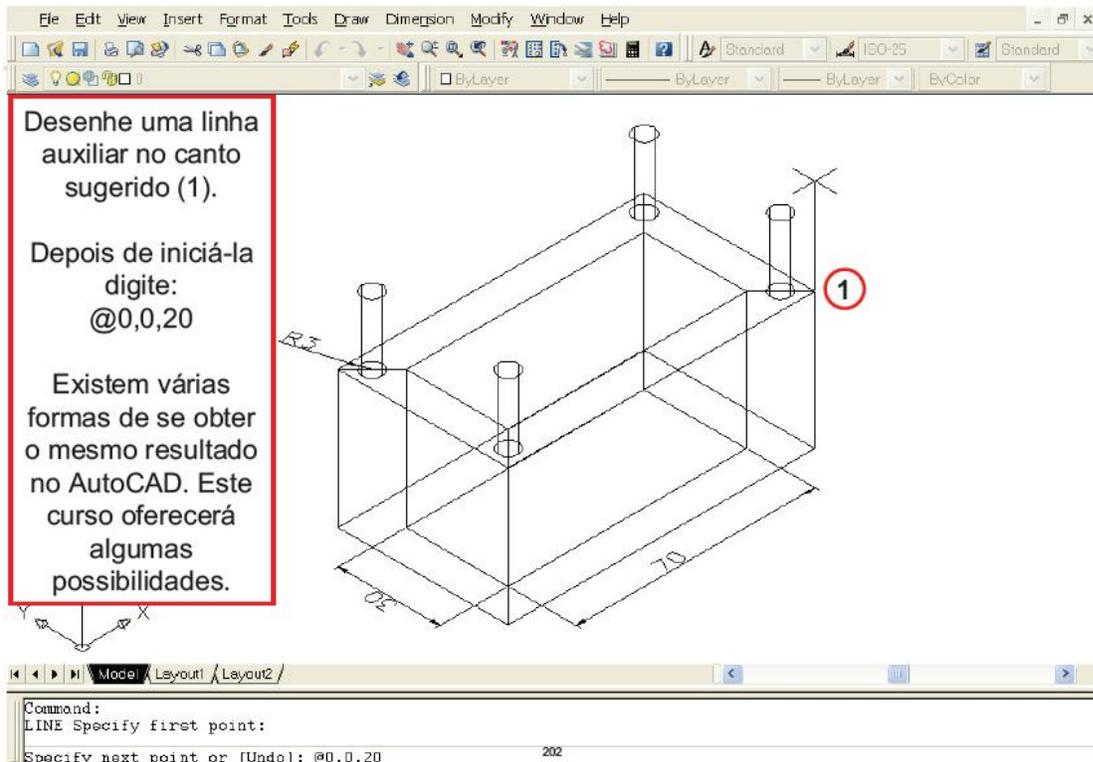
Etapa 13:



Etapa 14:



Etapa 15:



Etapa 16:

Digite Copy

2 Enter

Selecione a caixa vazada.

Enter

Use ENDPOINT para selecionar o vértice indicado **1**.

Enter

Clique no ponto **2** para terminar a cópia.

Model: Layout1 / Layout2 /

l: COPY
objects: 1 Found
objects:

203

Etapa 17:

Apenas para saber !!!!

A cópia poderia ter sido feita, clicando-se num ponto da base e digitando: @0,0,60

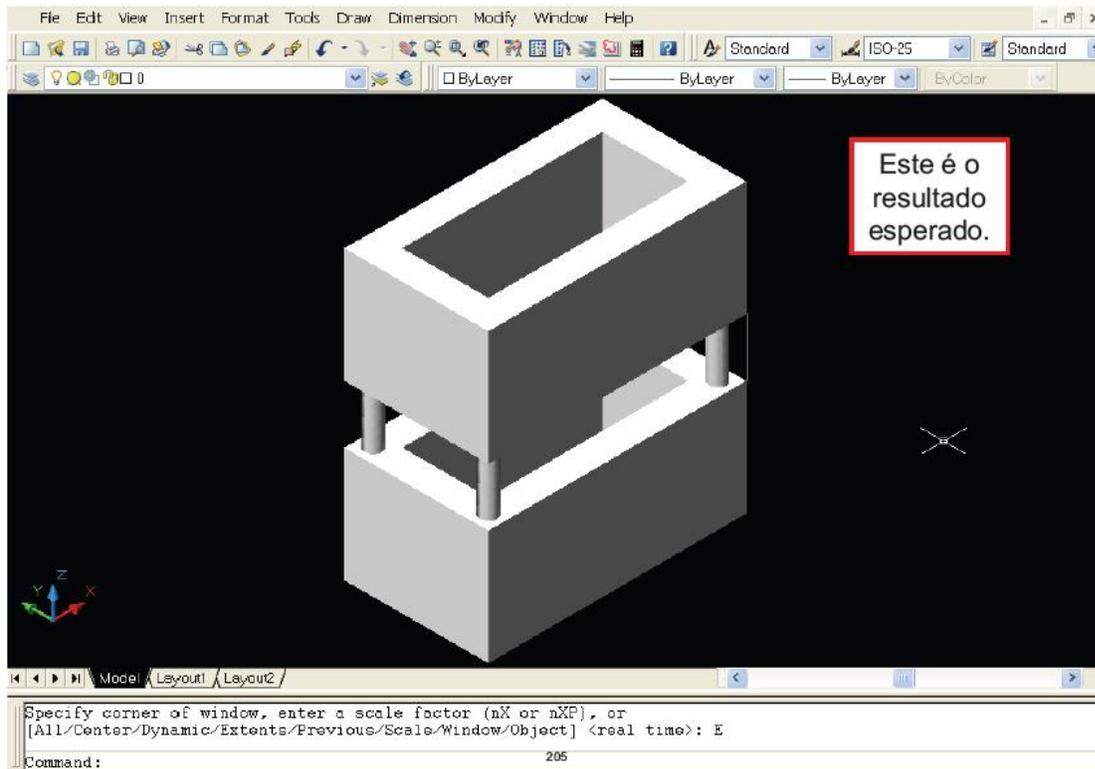
Endpoint

Model: Layout1 / Layout2 /

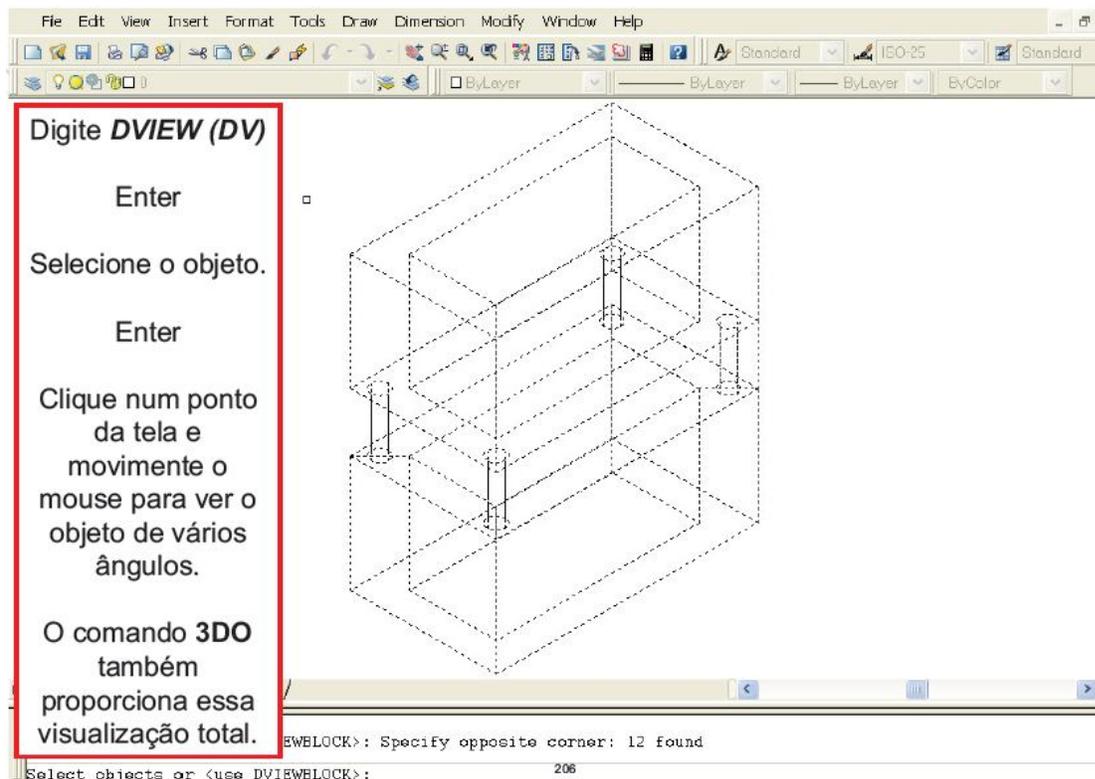
Select objects: 1 found
Select objects:
Specify base point or [Displacement] <Displacement>: Specify second point or <use first point as displacement>:

204

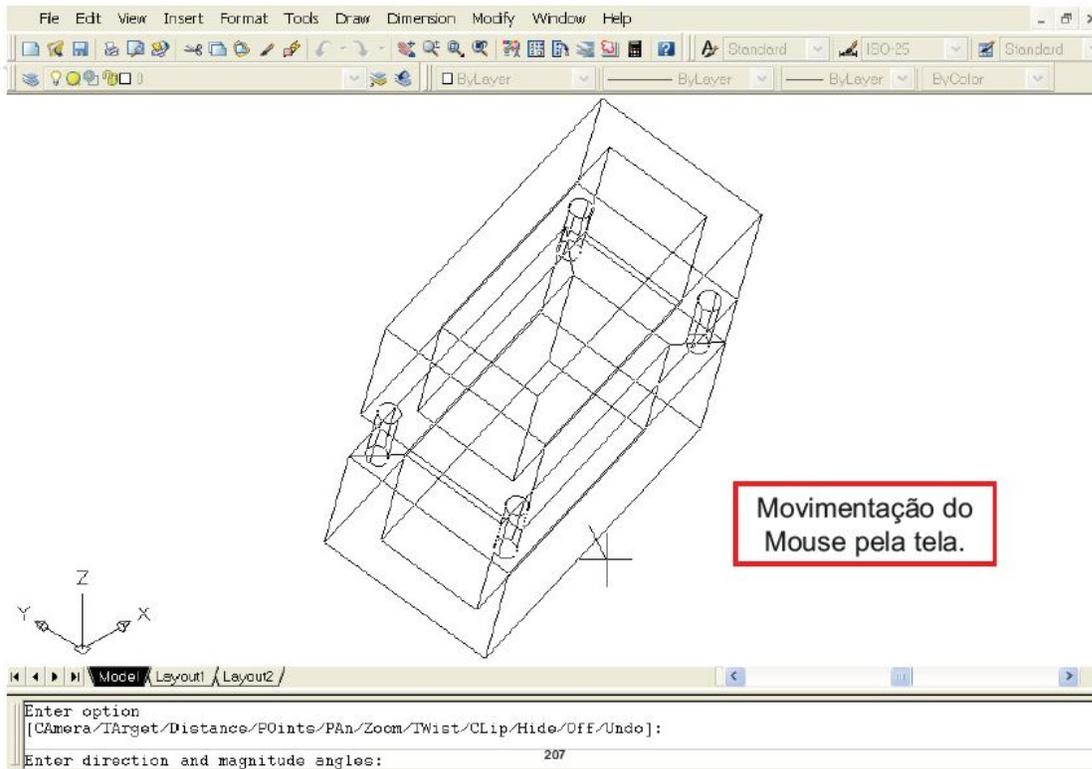
Etapa 18:



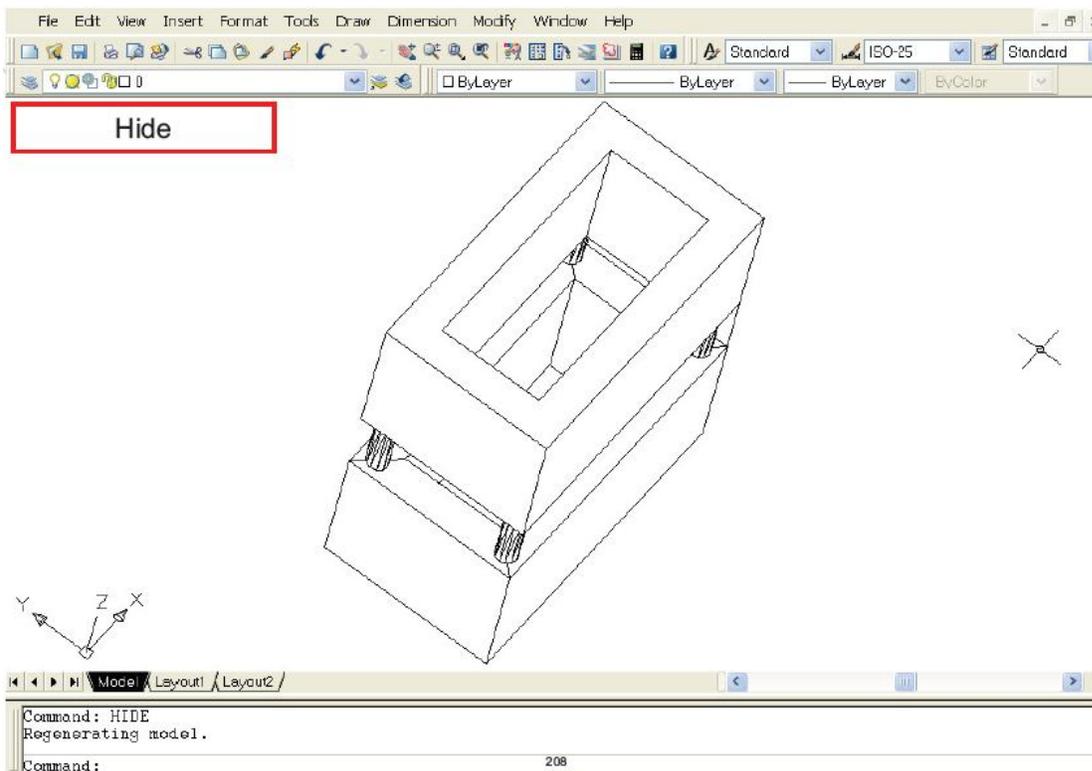
Etapa 19:



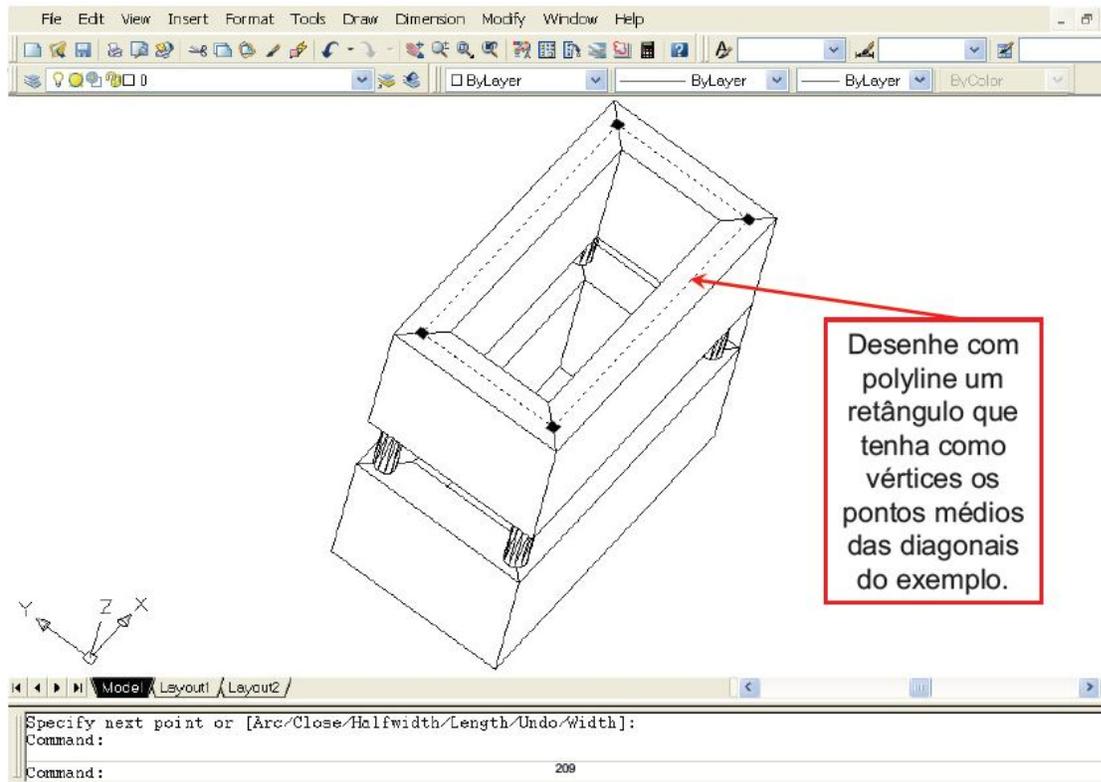
Etapa 20:



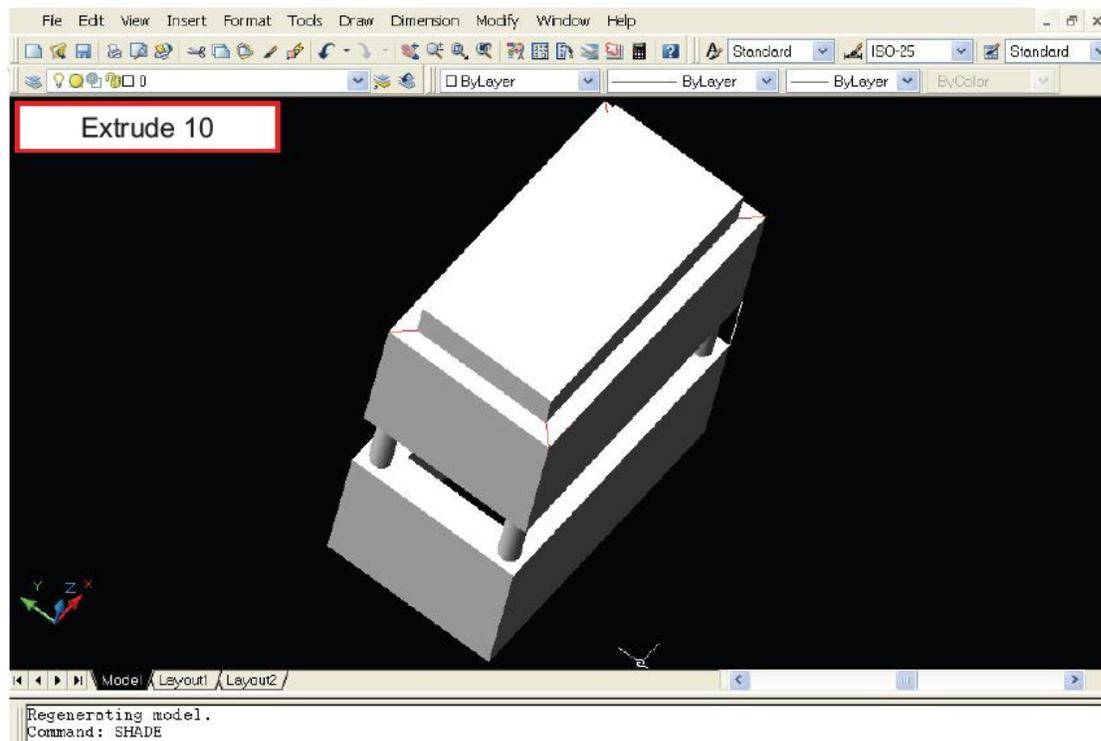
Etapa 21:



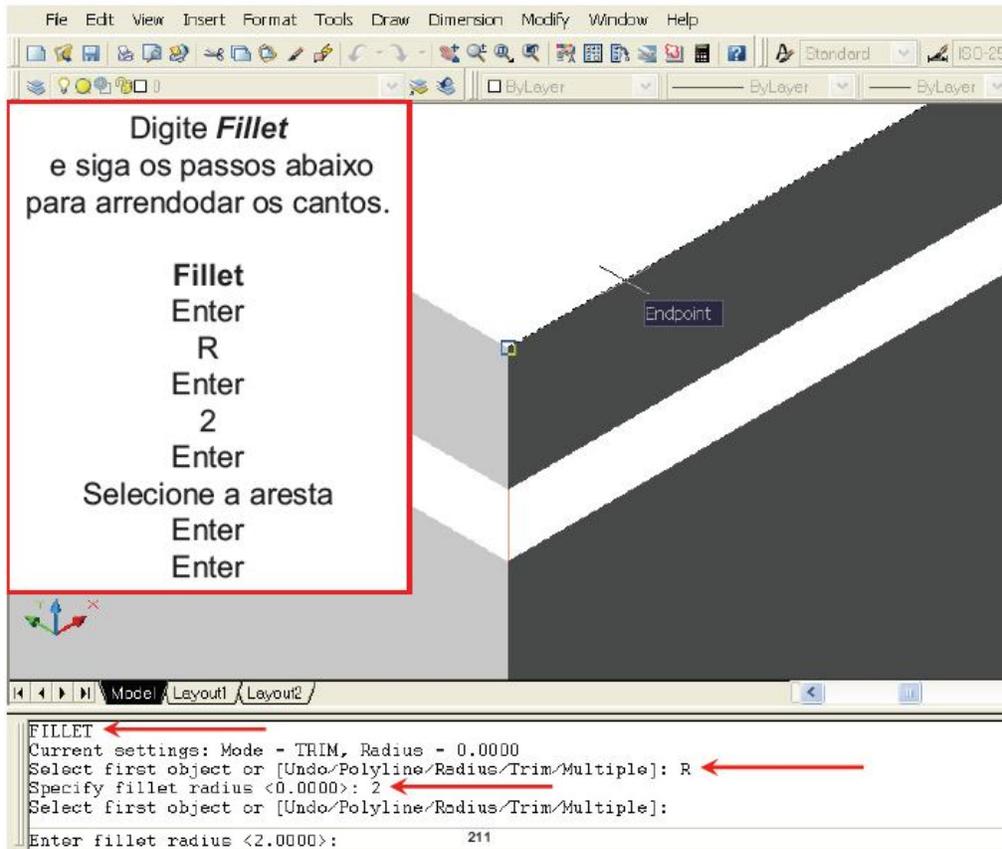
Etapa 22:



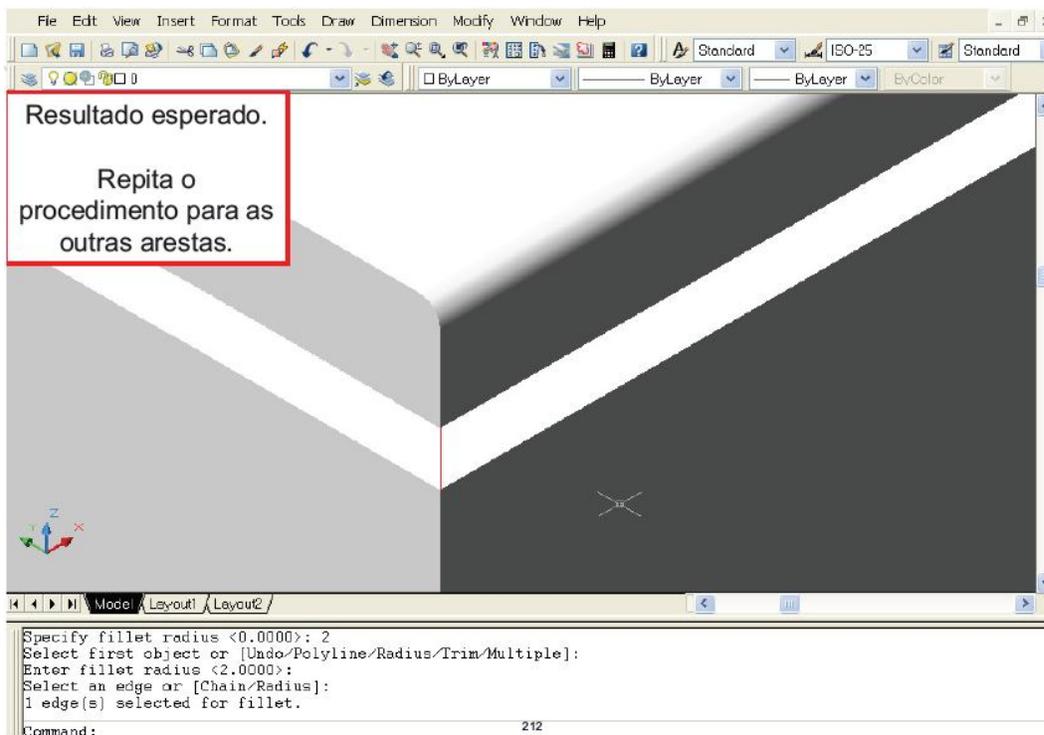
Etapa 23:



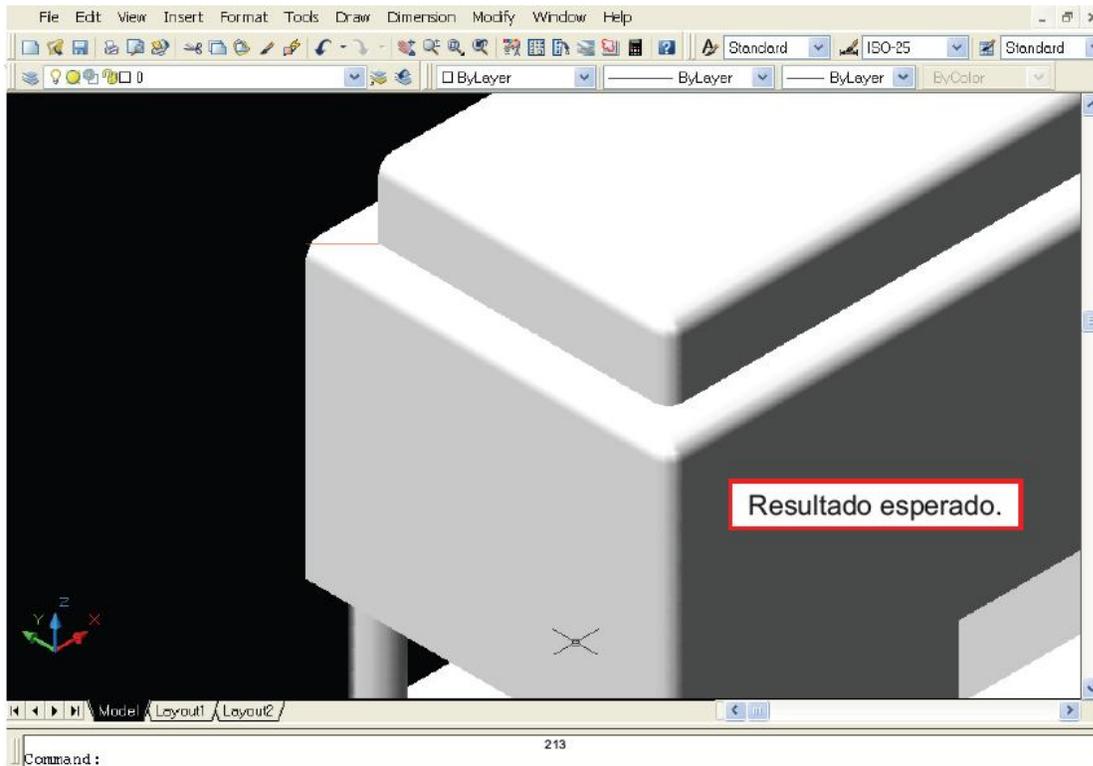
Etapa 24:



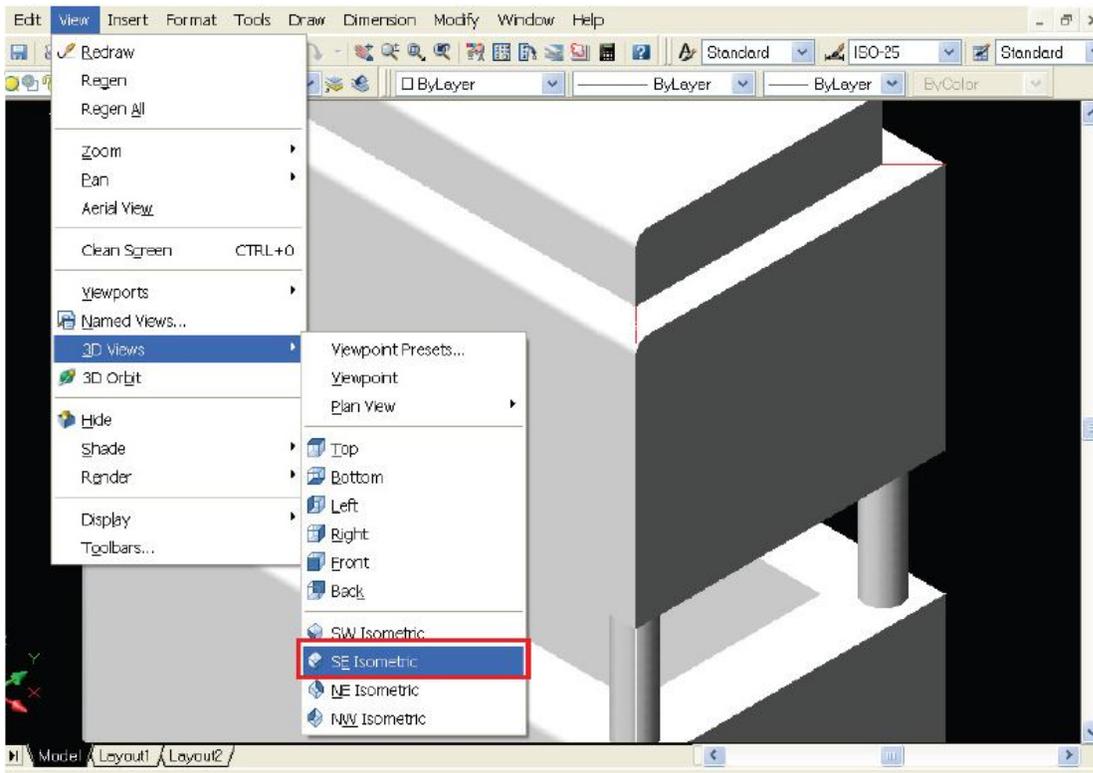
Etapa 25:



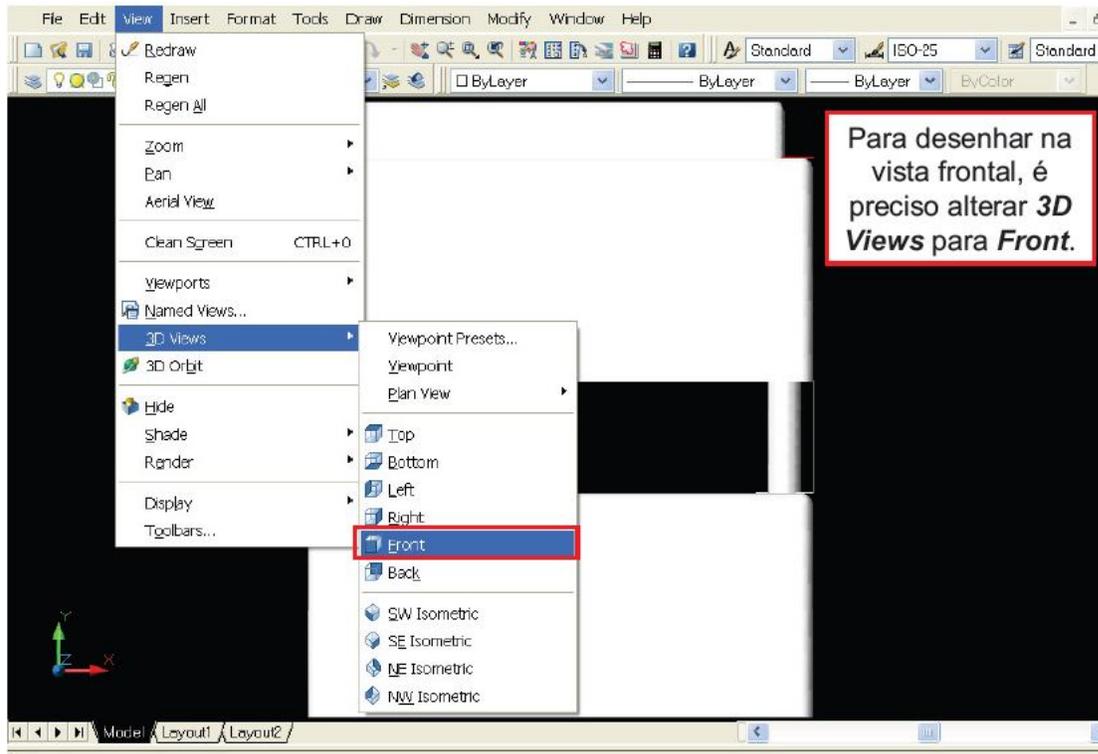
Etapa 26:



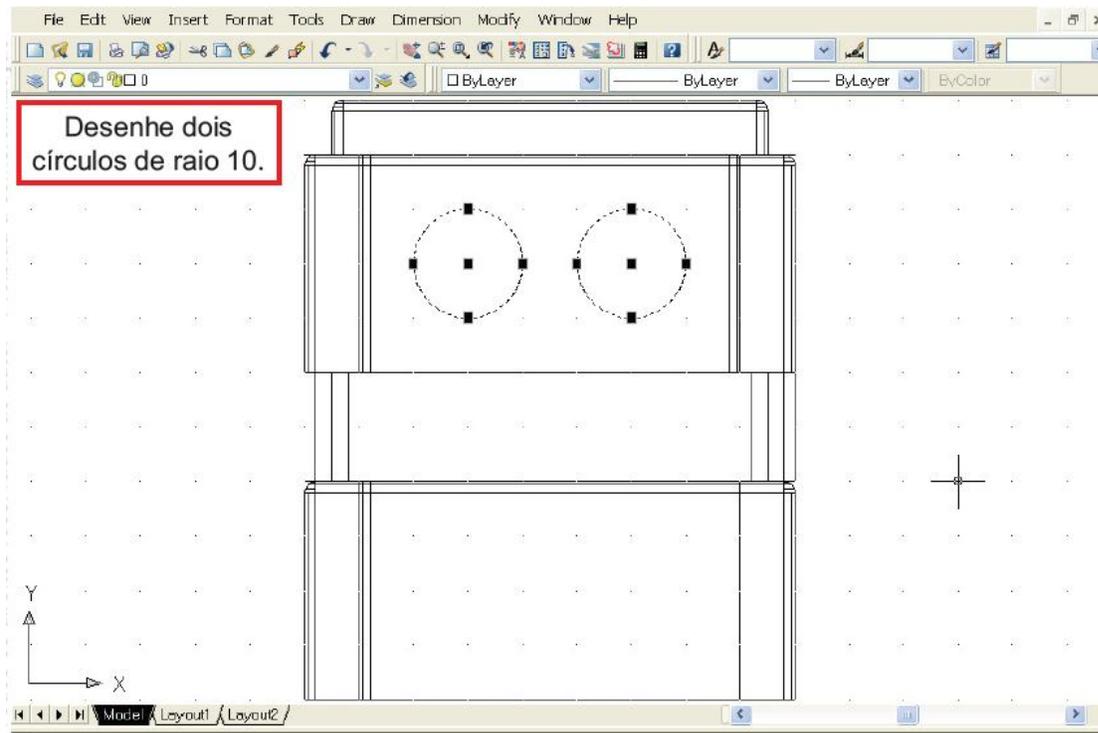
Etapa 27:



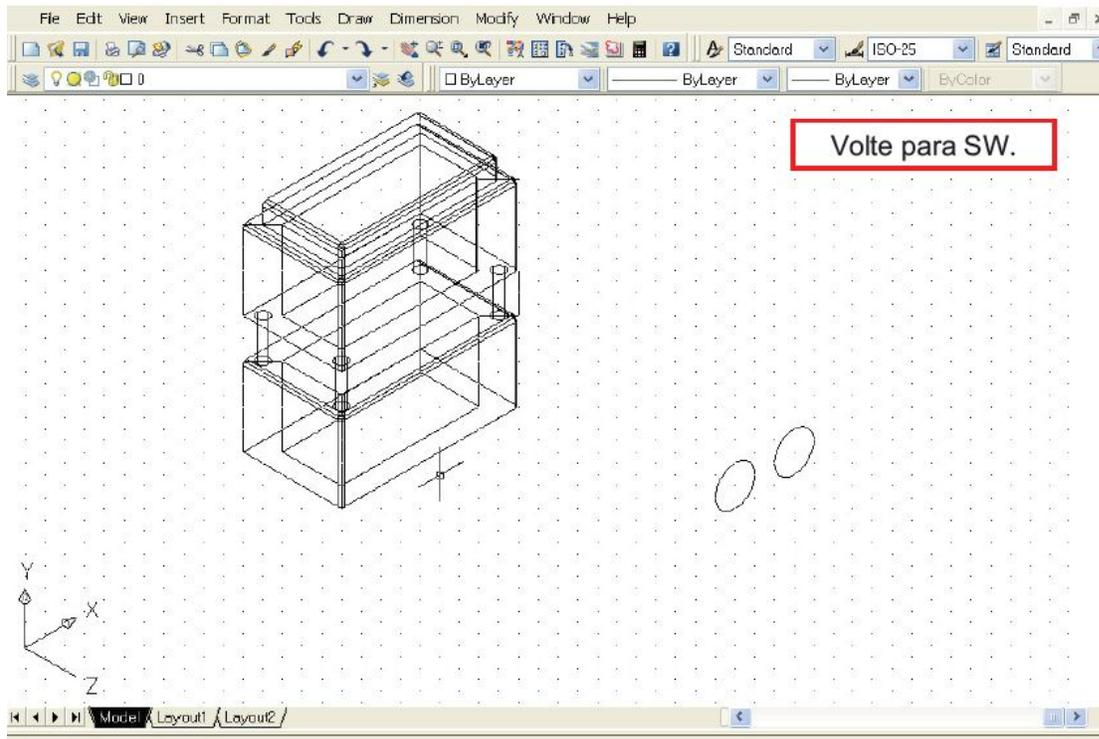
Etapa 27:



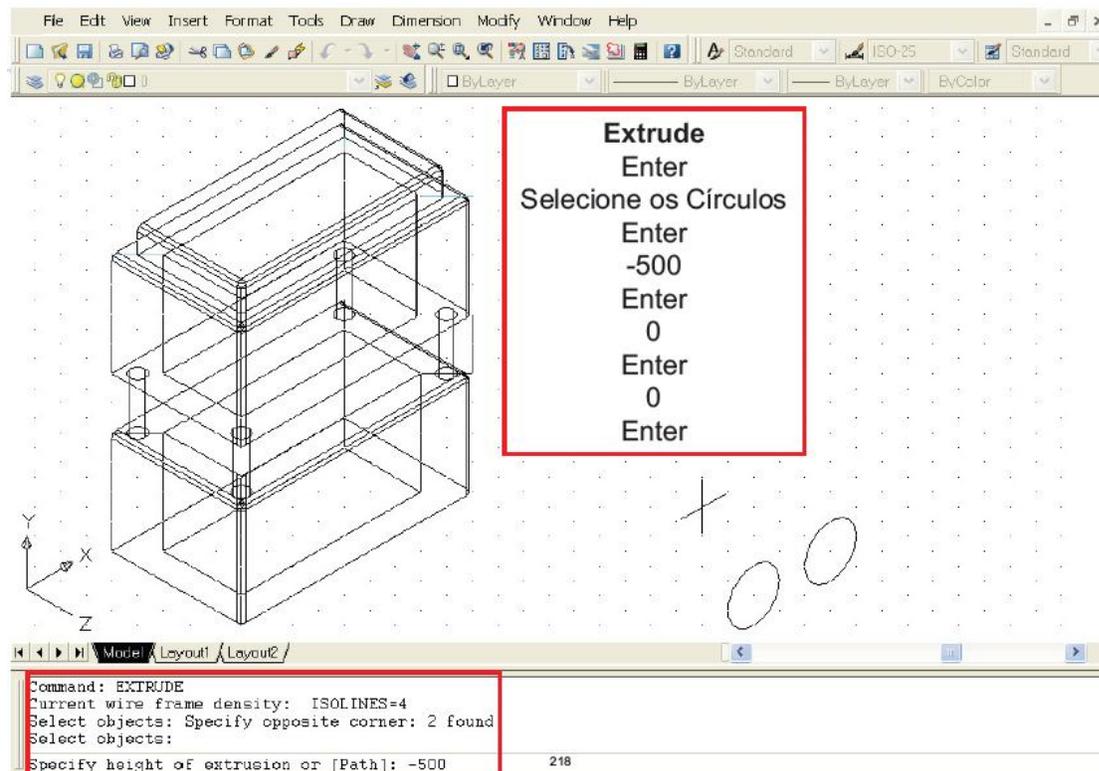
Etapa 28:



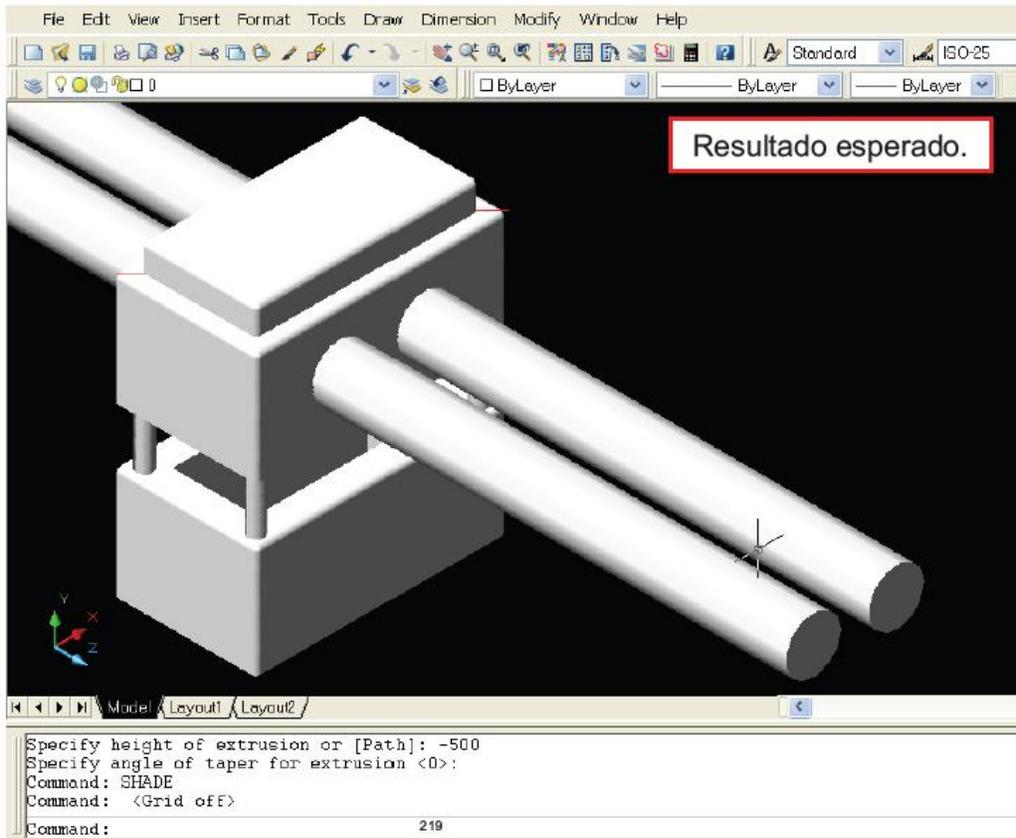
Etapa 29:



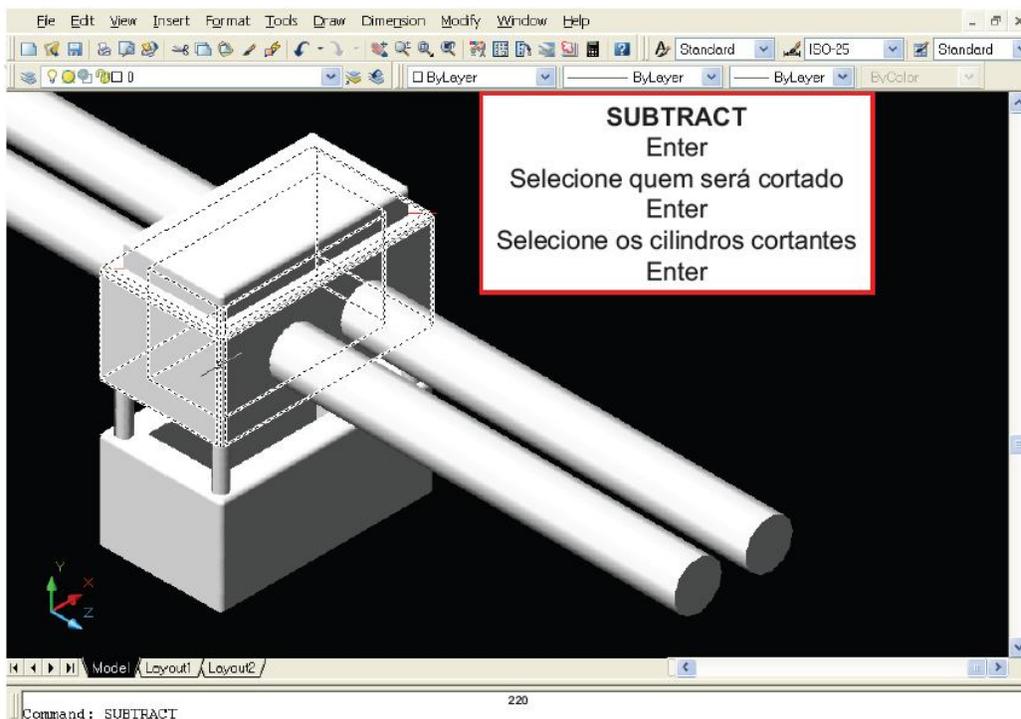
Etapa 30:



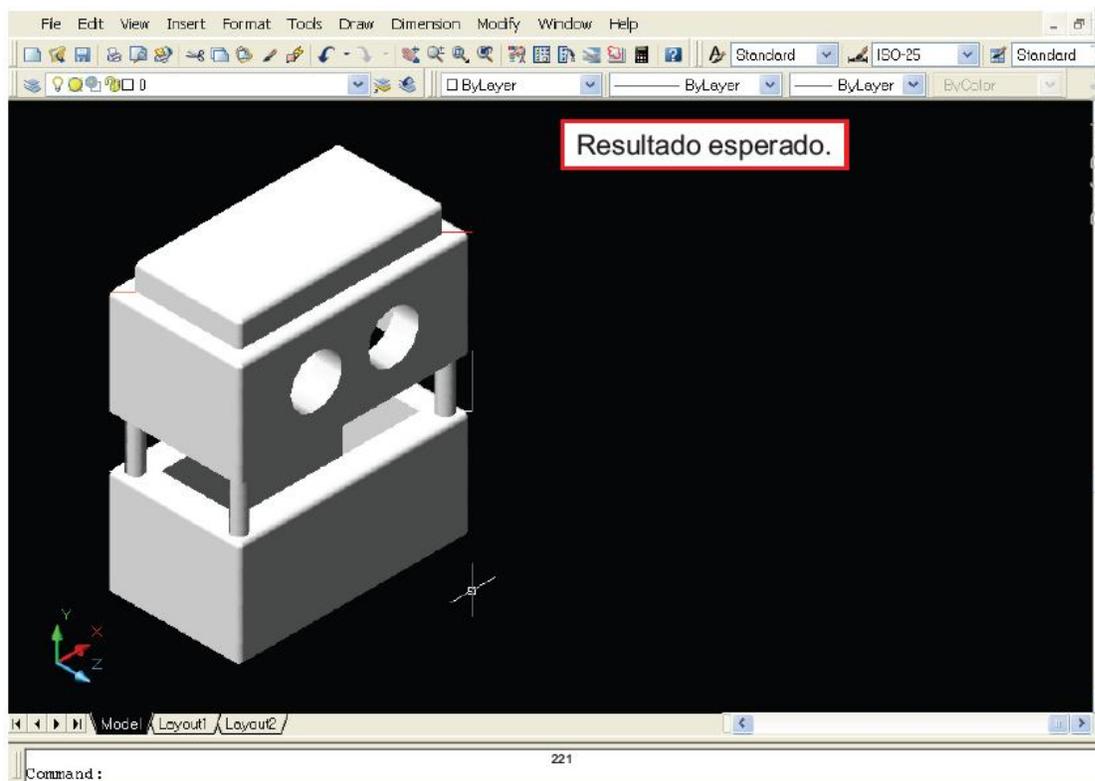
Etapa 31:



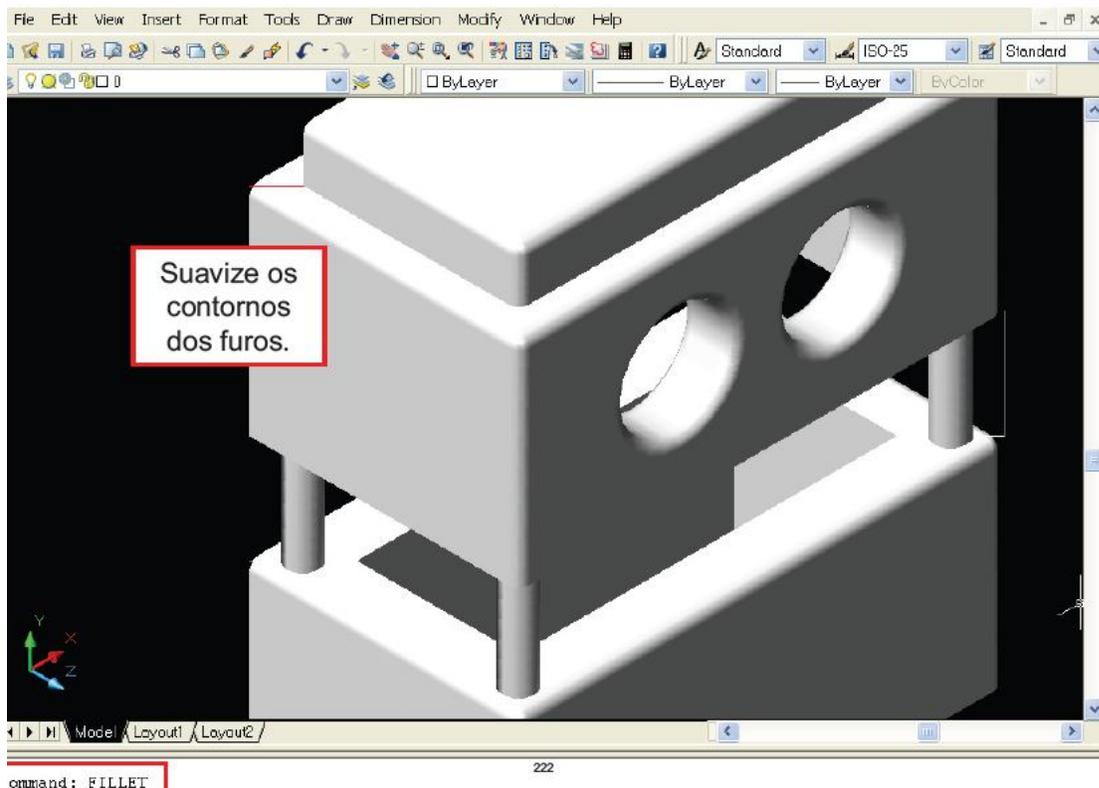
Etapa 32:



Etapa 33:



Etapa 34:

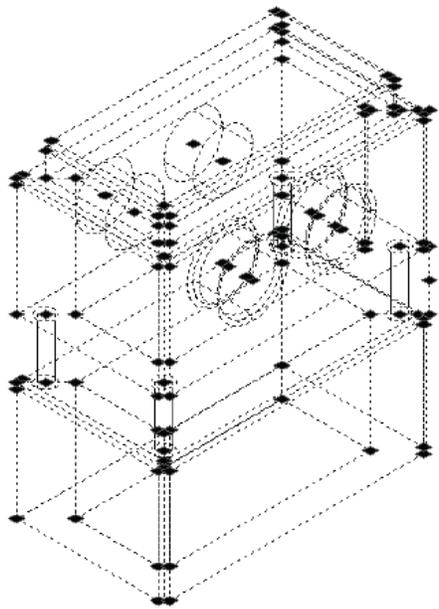
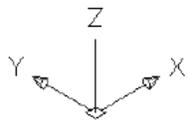
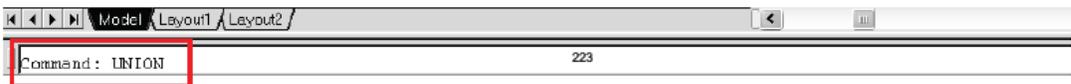


Etapa 35:

File Edit View Insert Format Tools Draw Dimension Modify Window Help

Una todas as partes do modelo.

UNION
Enter
Selecione tudo
Enter

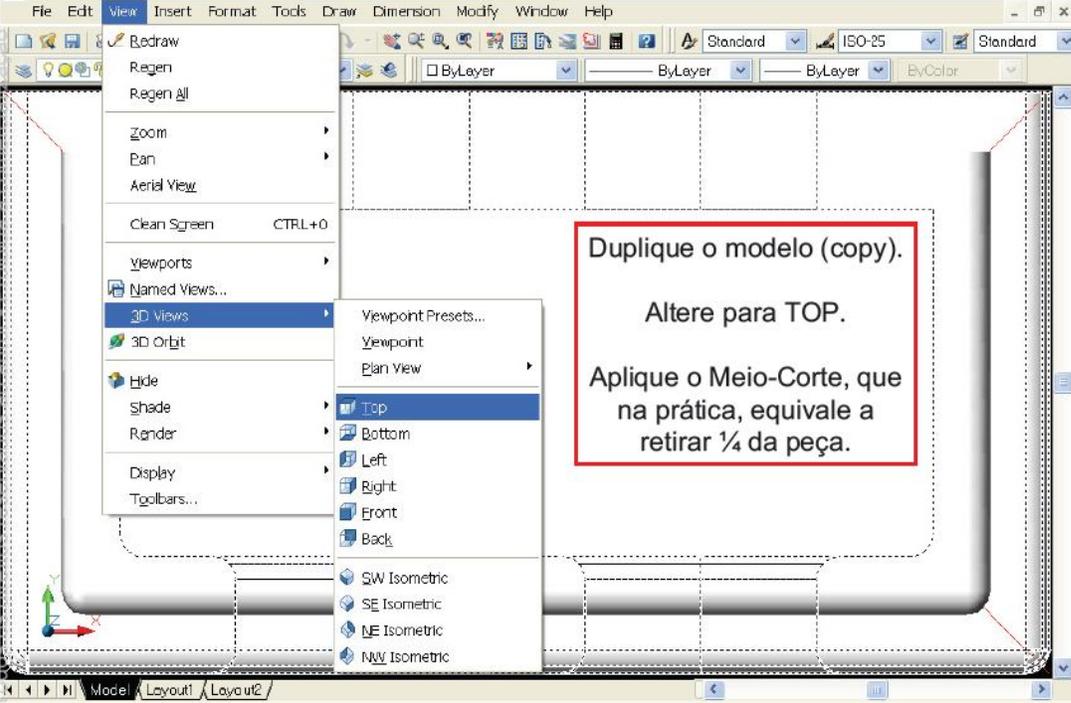
Etapa 36:

File Edit View Insert Format Tools Draw Dimension Modify Window Help

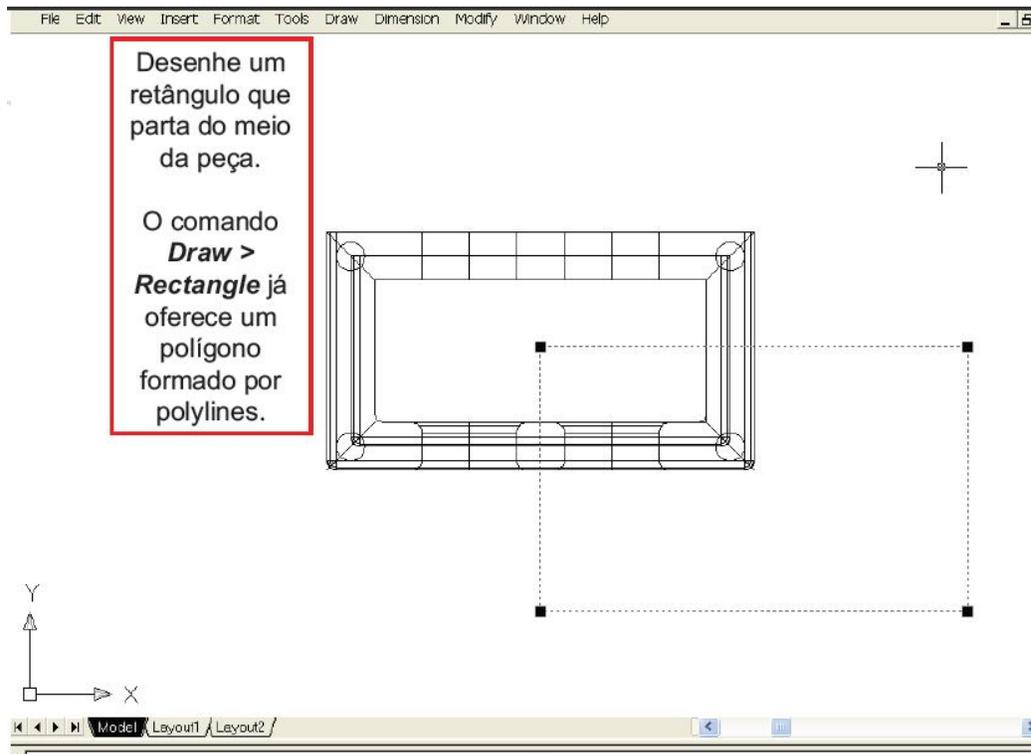
Redraw Regen Regen All Zoom Pan Aerial View Clean Screen CTRL+0 Viewports Named Views... 3D Views 3D Orbit Hide Shade Render Display Toolbars...

Viewpoint Presets... Viewpoint Plan View Top Bottom Left Right Front Back SW Isometric SE Isometric NE Isometric NW Isometric

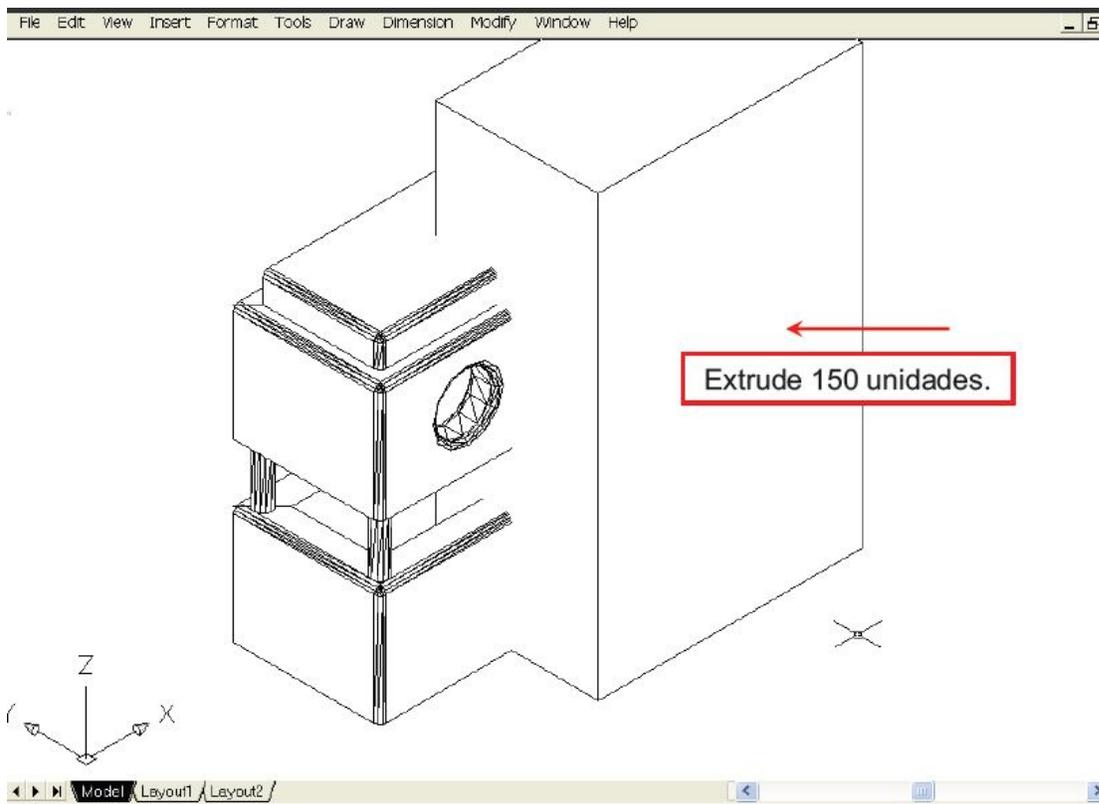
Duplique o modelo (copy).
Altere para TOP.
Aplique o Meio-Corte, que na prática, equivale a retirar 1/4 da peça.



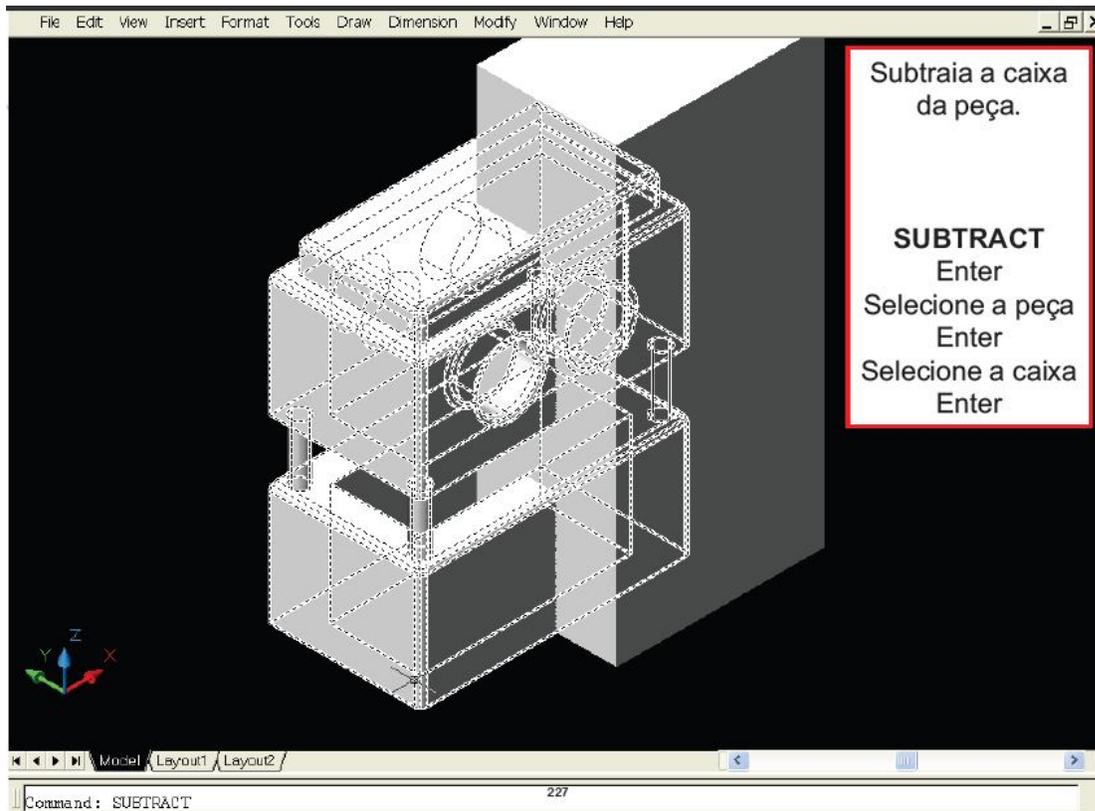
Etapa 37:



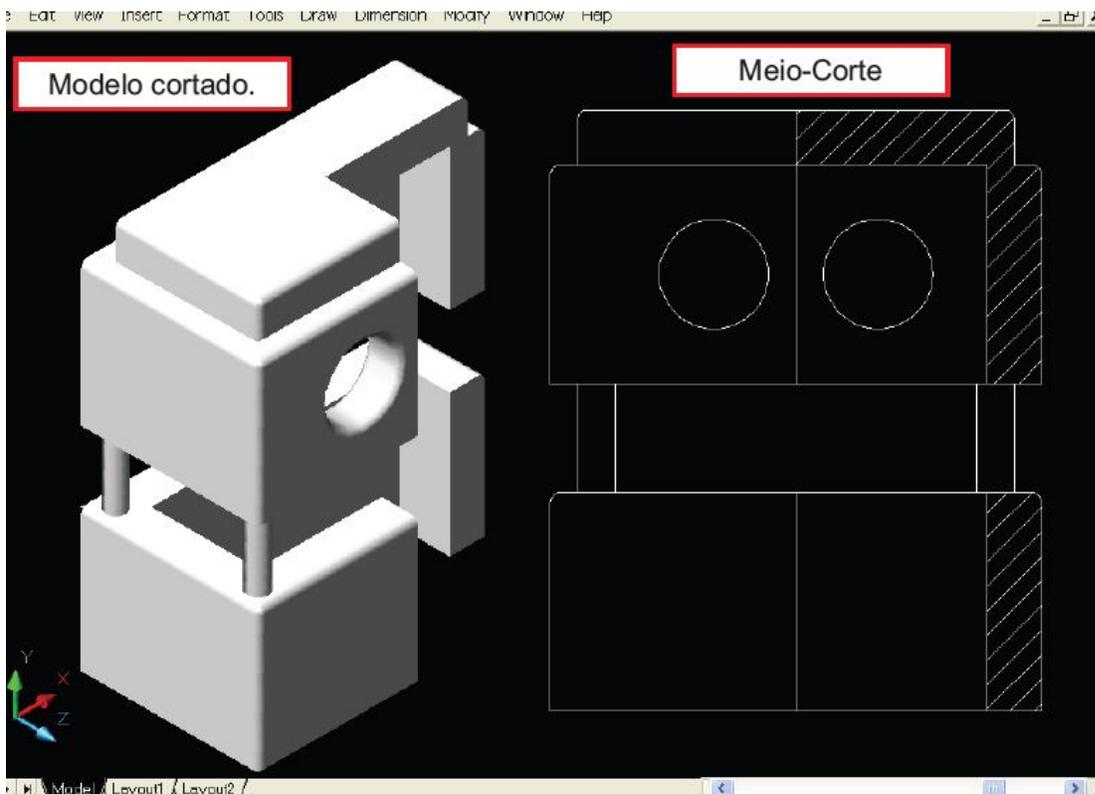
Etapa 38:



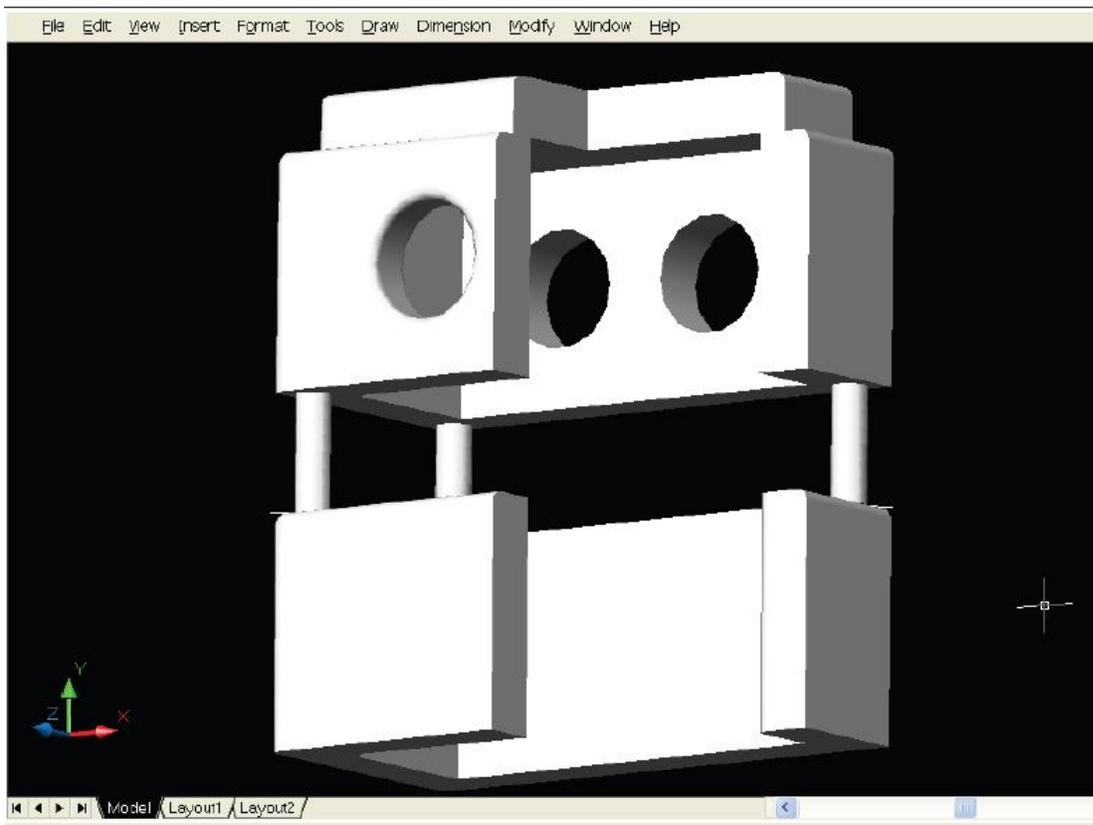
Etapa 39:



Etapa 40:



Etapa 41:

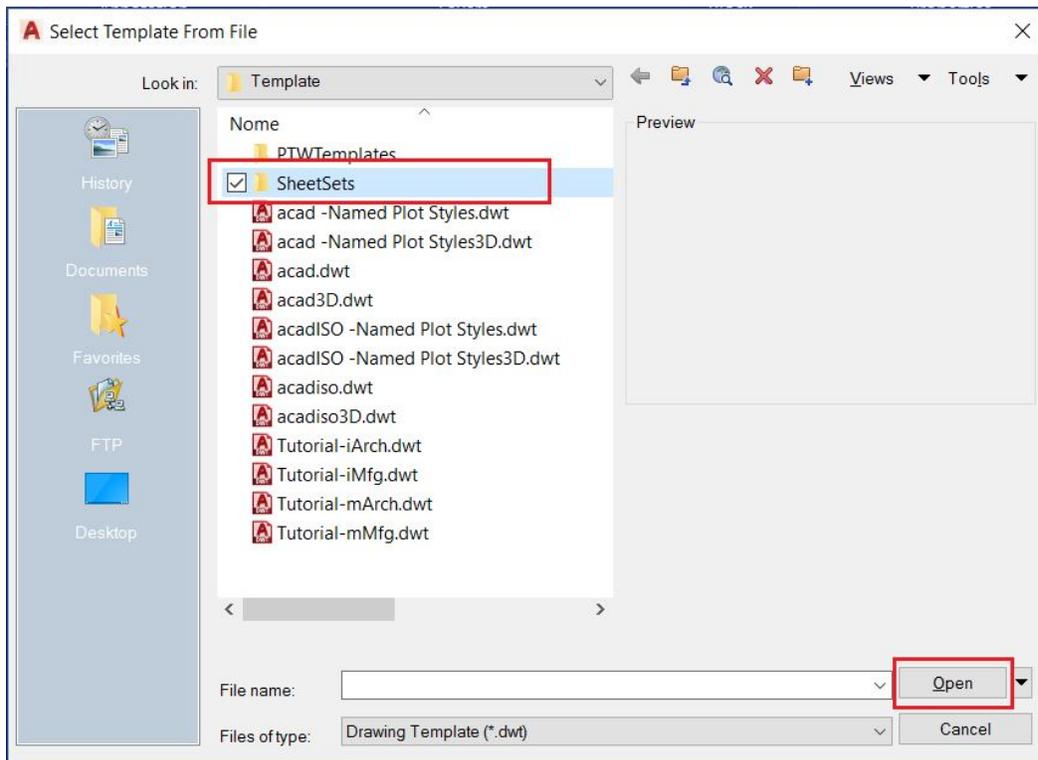


Etapa 42:

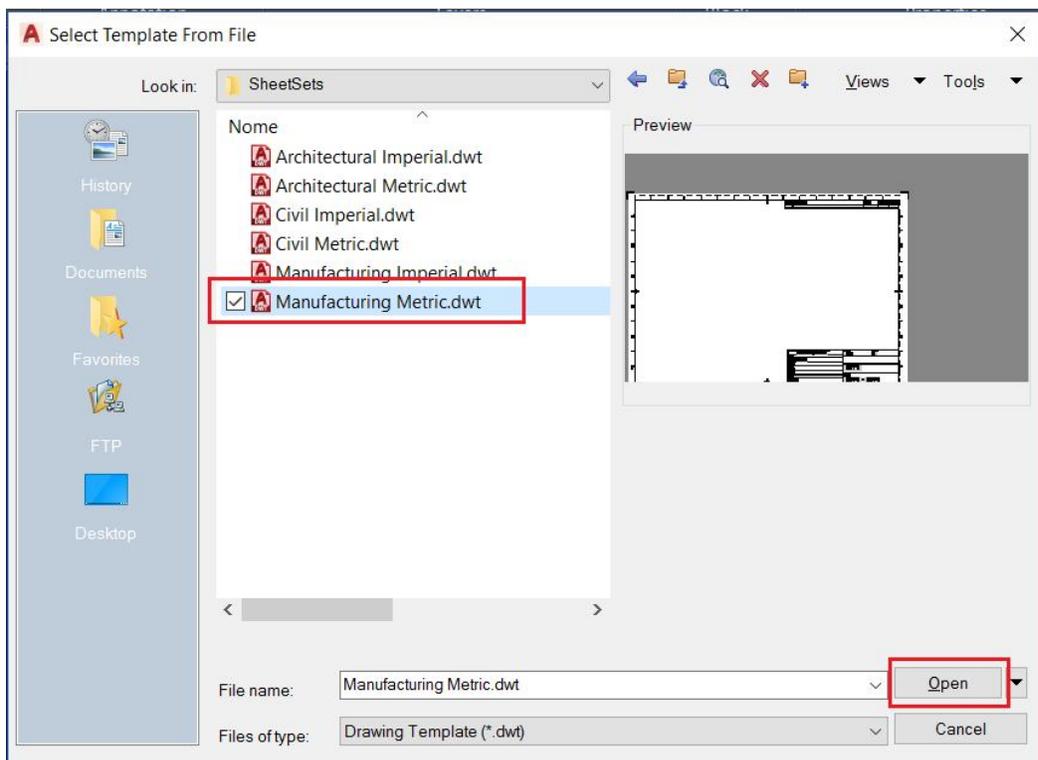
Inserir formato:

- Posicionar o ponteiro do mouse em cima da aba " Model"
- Clicar com o botão direito do mouse
- Selecionar a opção "From Template"

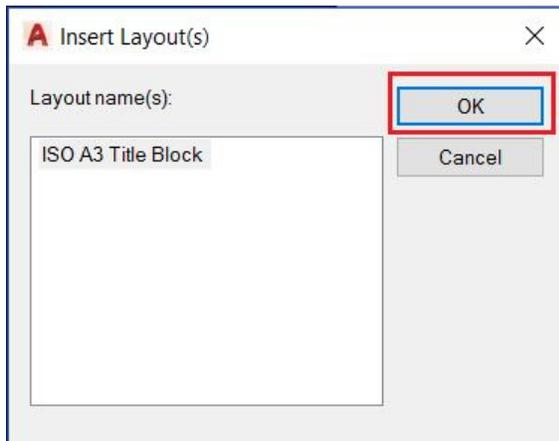
Etapa 43:



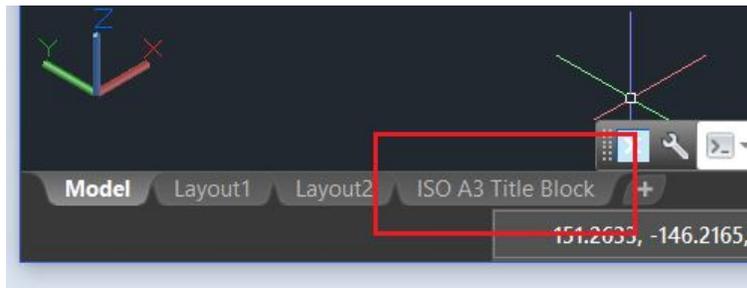
Etapa 44:



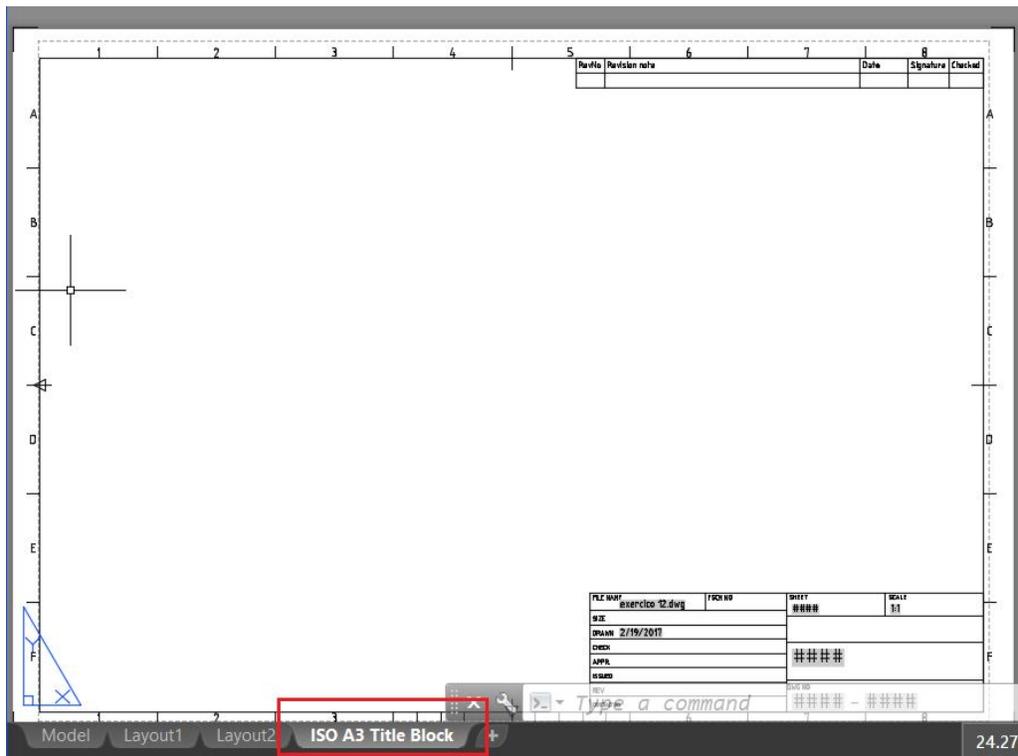
Etapa 45:



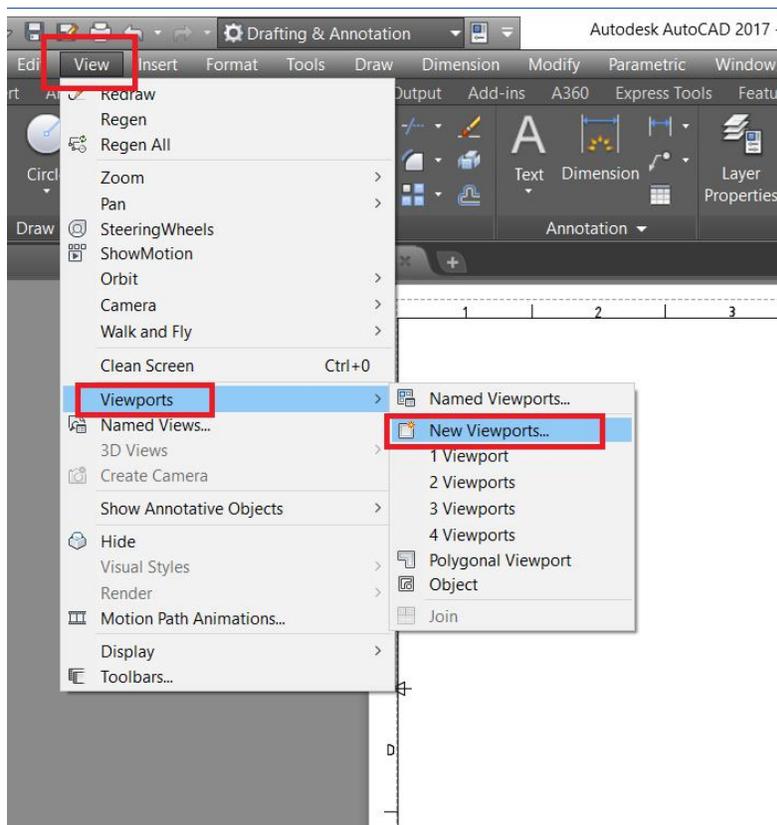
Etapa 46:



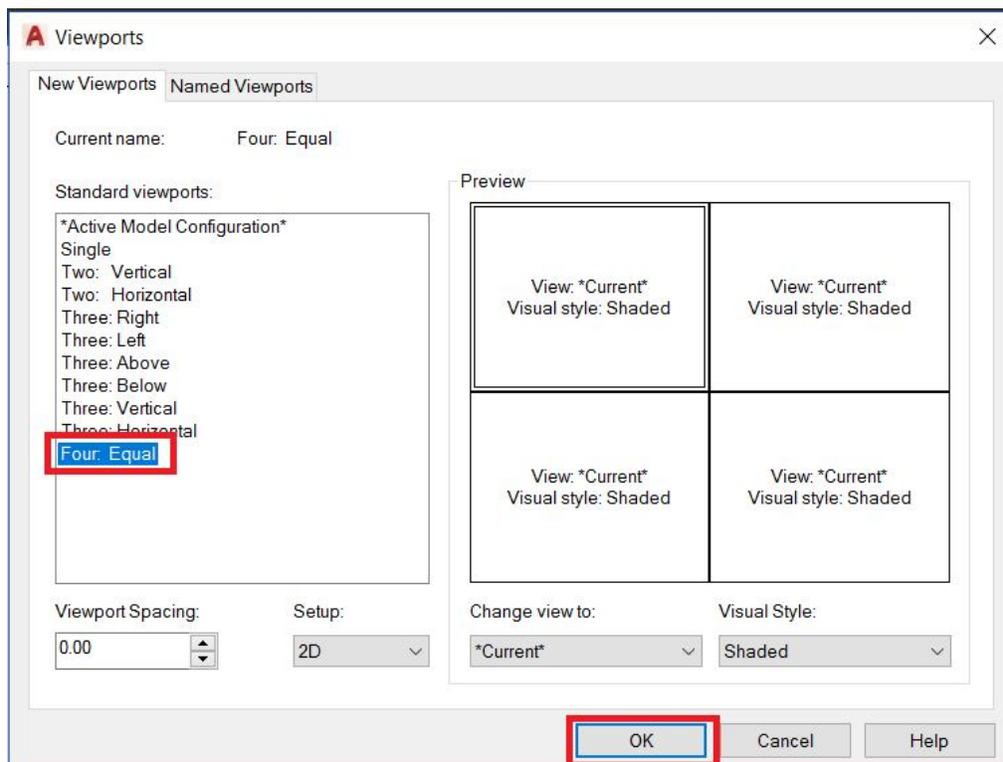
Etapa 47:



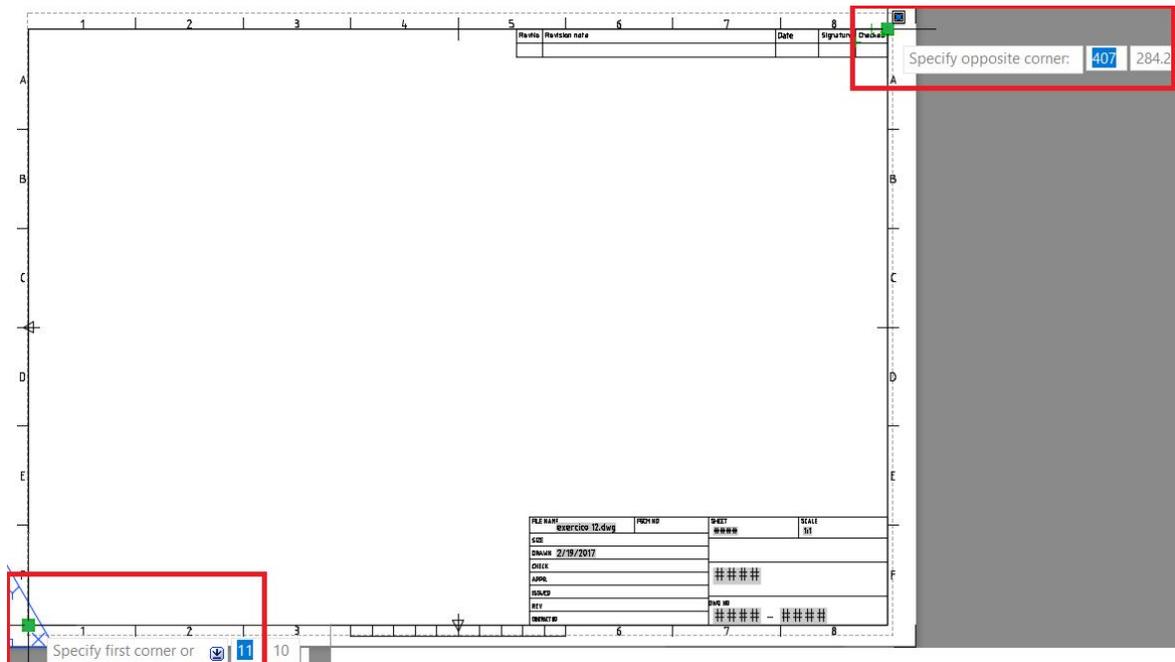
Etapa 48:



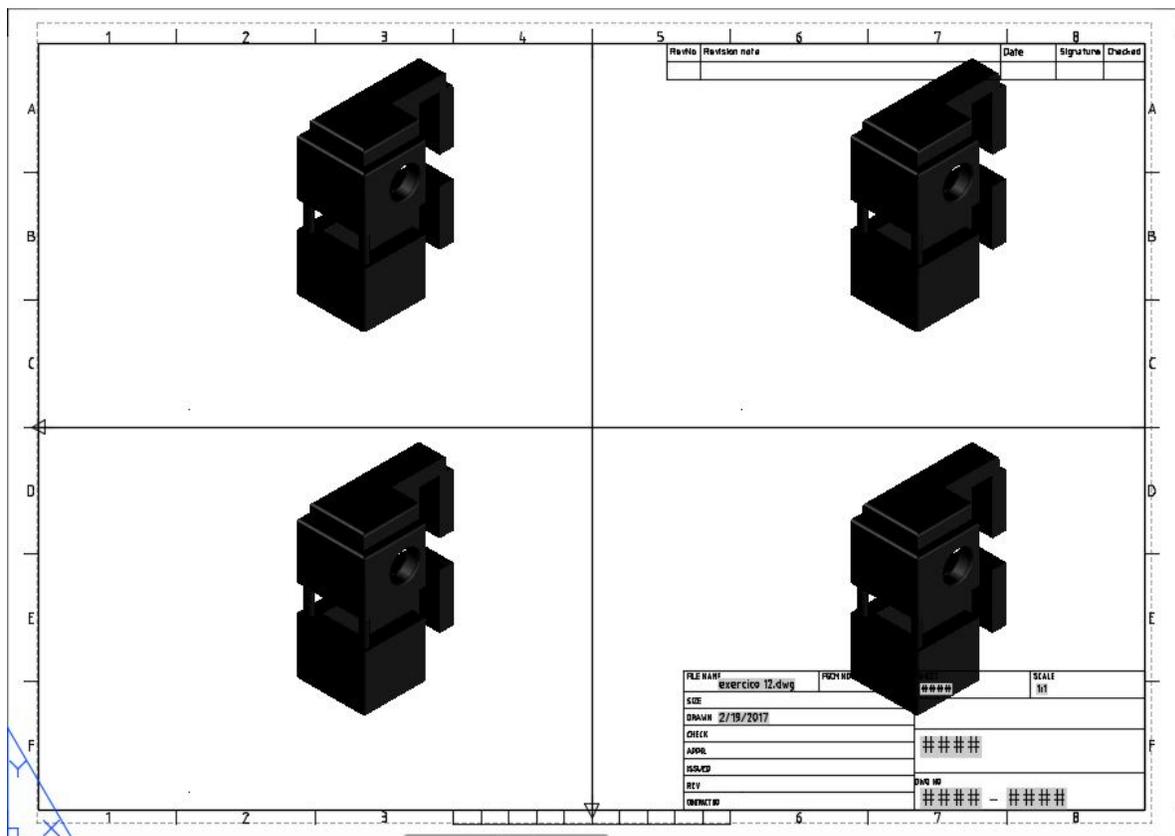
Etapa 49:



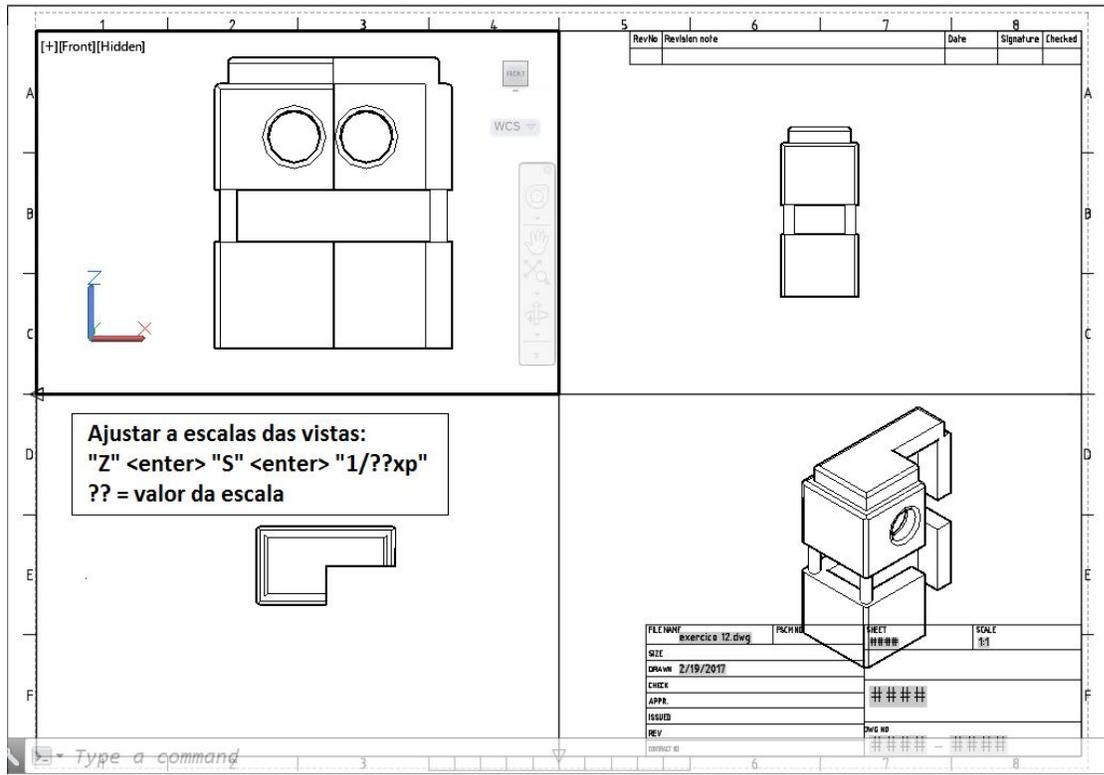
Etapa 50:



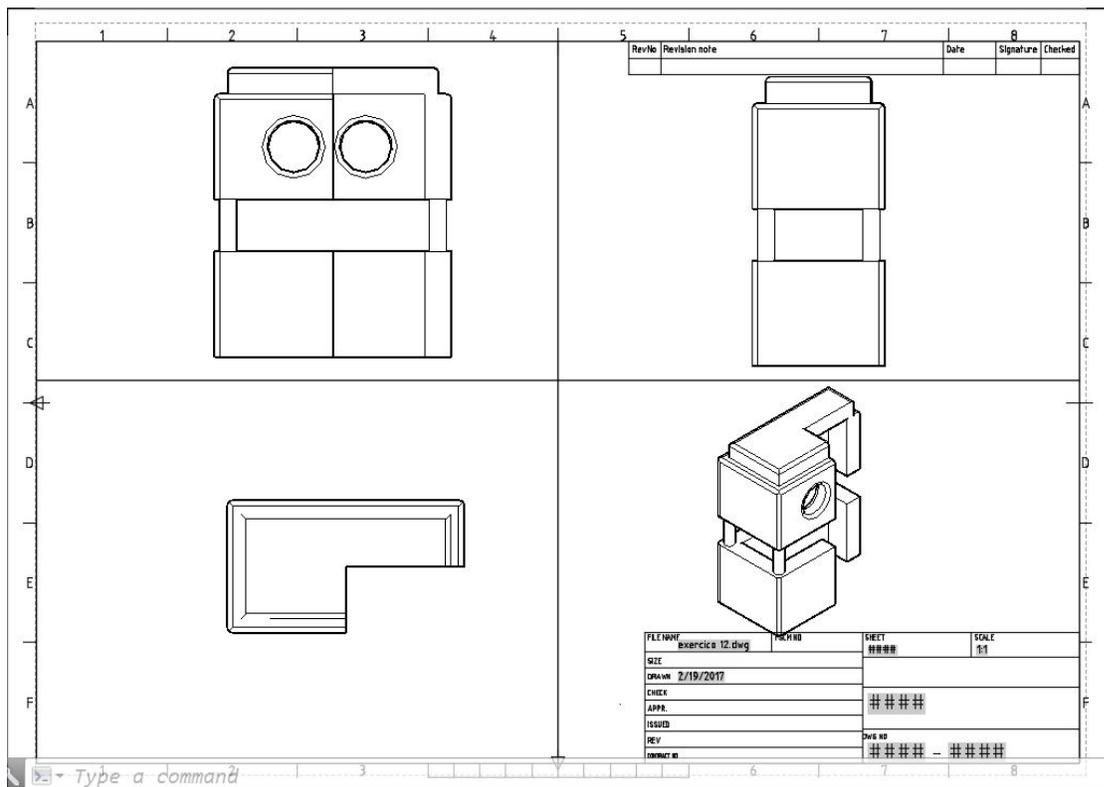
Etapa 51:



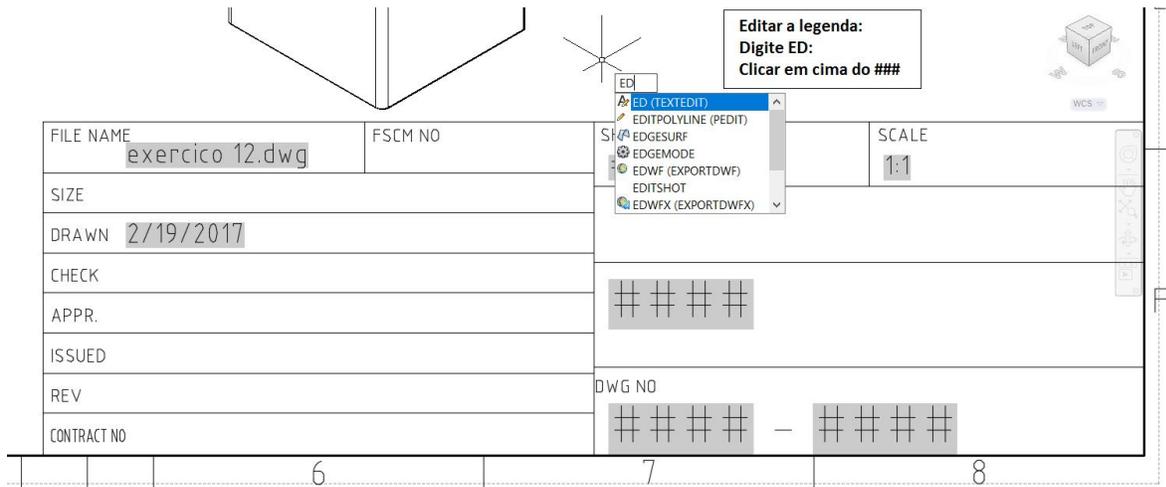
Etapa 54:



Etapa 55:

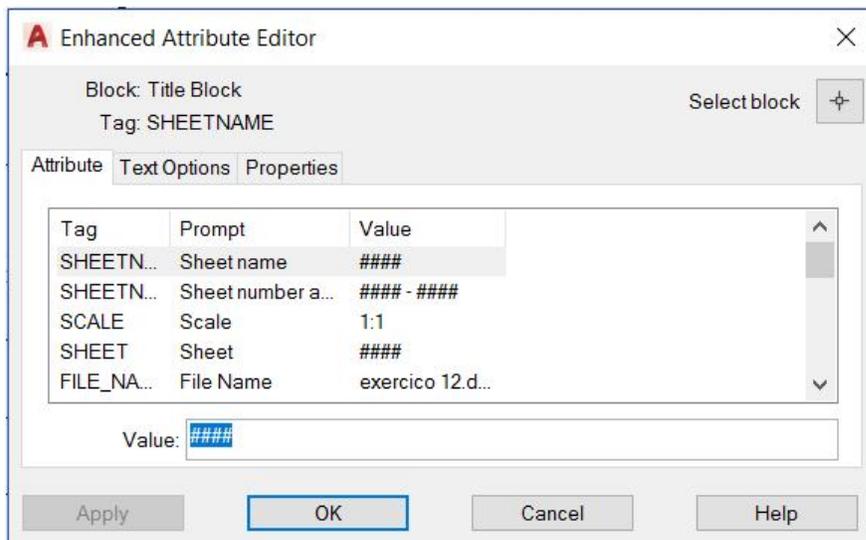


Etapa 56:

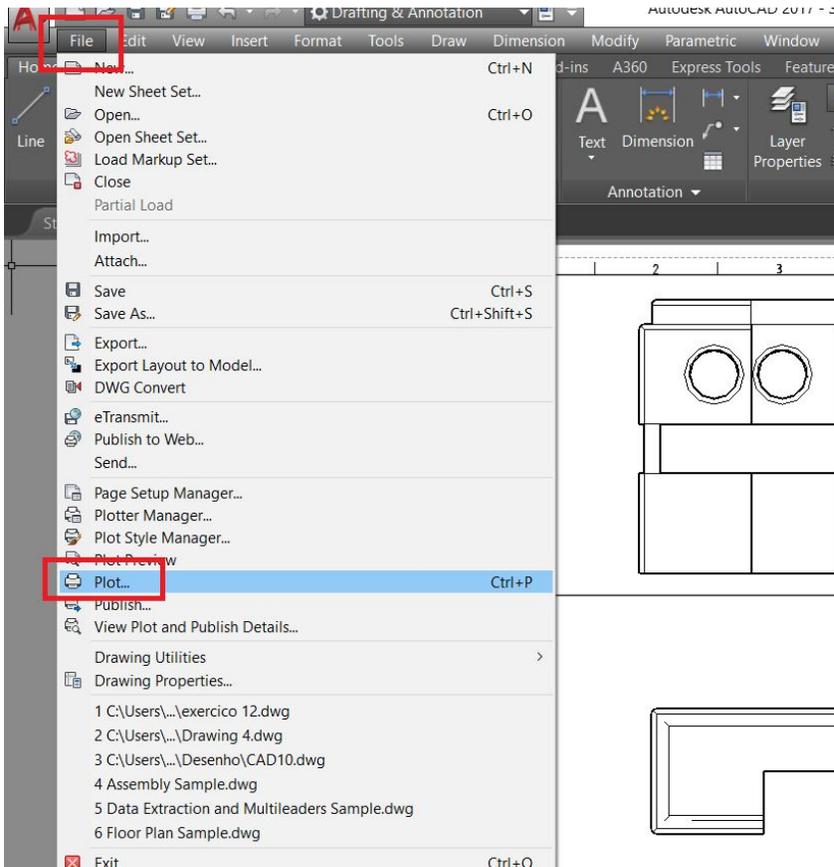


Etapa 57:

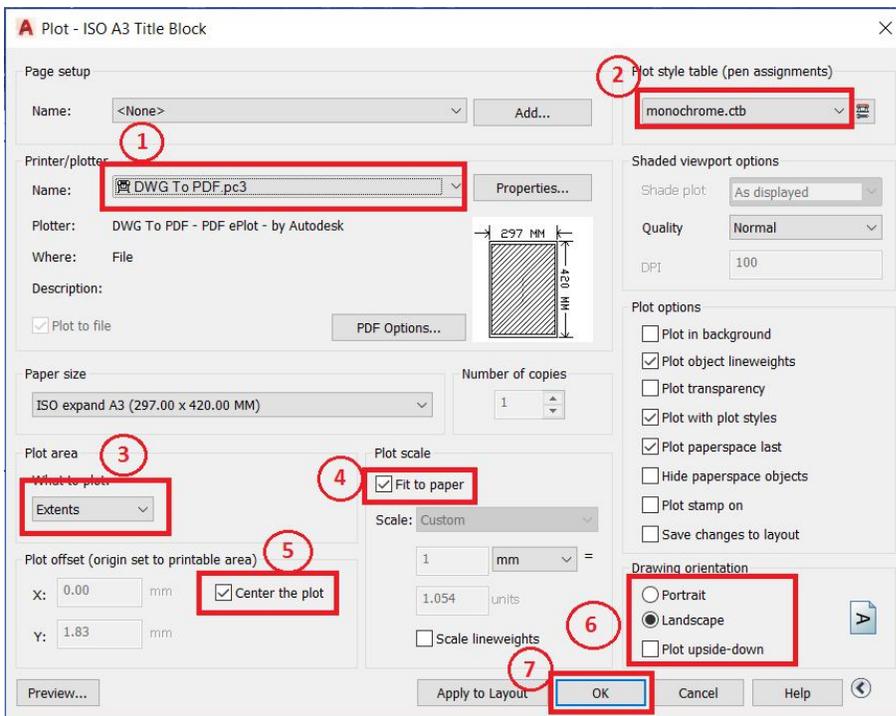
Preencher os campos com o valor desejado, "enter" pula para a próxima linha e "esc" finaliza o comando.



Etapa 58:



Etapa 59:



Etapa 60:

