

Modelação Geométrica e Generativa

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MGG
2

*Mestrado Integrado em Arquitectura
Ano Lectivo 2025-2026 1º Semestre
Docente - Nuno Alão 2º Ano*

Modelação Geométrica e Generativa

1. Apresentação do conteúdo programático a desenvolver durante o semestre;
2. Trabalhos a realizar durante as aulas;
3. Método de Avaliação;
4. Apresentação e instalação do programa Rhino.

Coordenadas absolutas e relativas

Existem coordenadas Absolutas e Relativas

Exercicio de Aula- Construção de um Pentagono

Escrever na Barra de comando-

1. Poly

2. Enter

3. Coordenada Absoluta:

20,10

4. Coordenadas Relativas:

@9<72;

@9<144

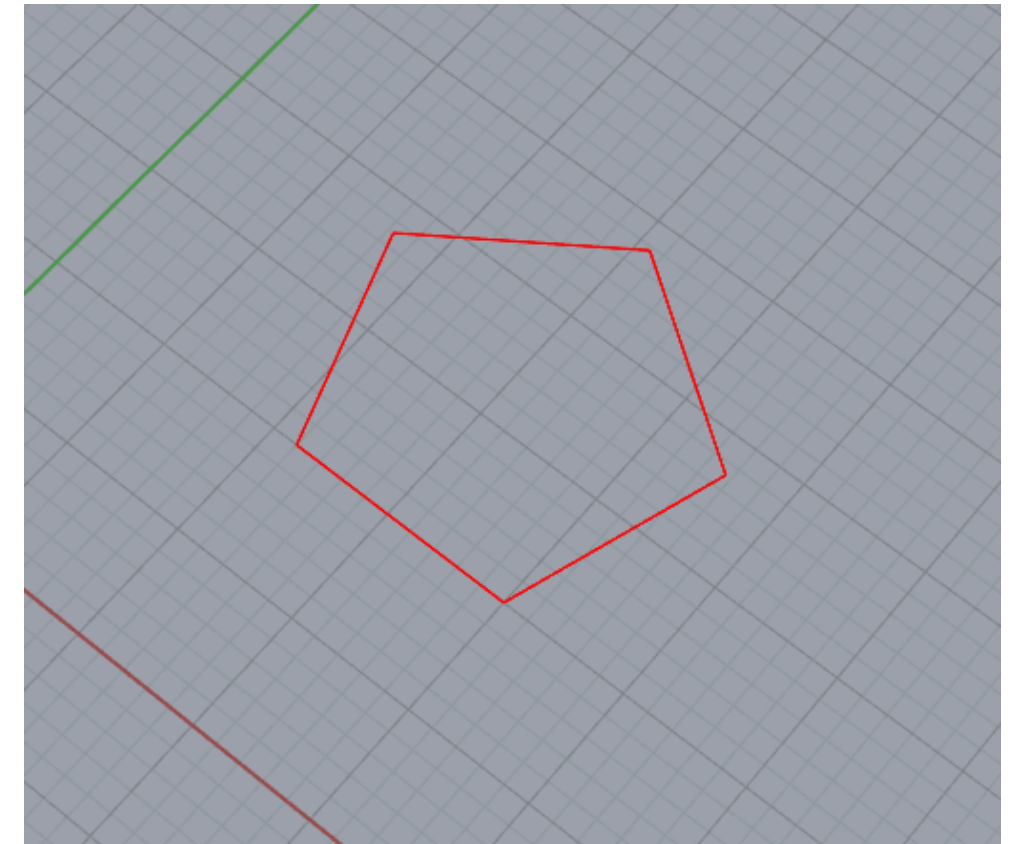
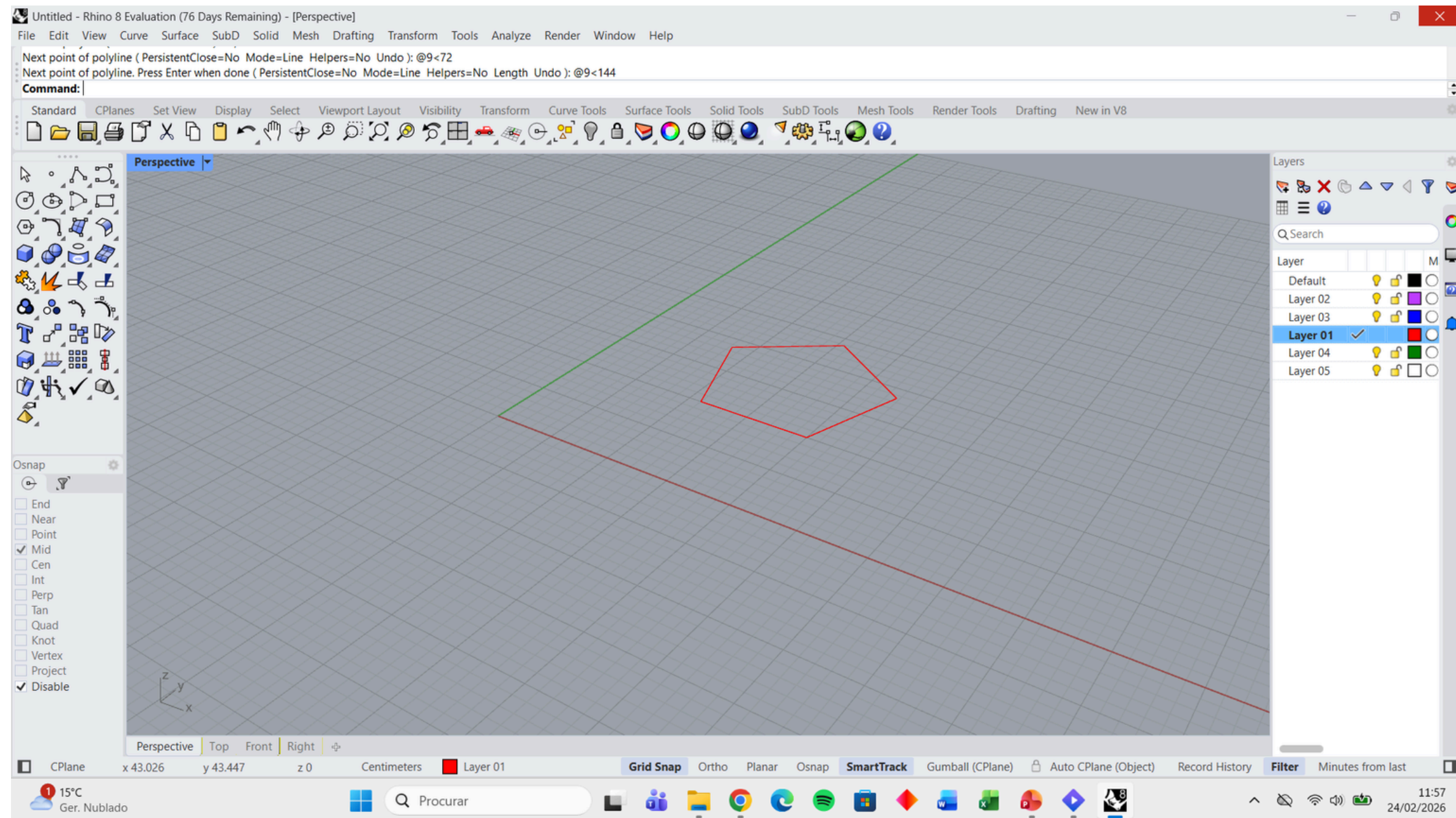
@9<216

@9<288

@9<360

(Colocar Enter entre todas as ações)

5. Enter



Next point of polyline (PersistentClose=No Mode=Line Helpers=No Undo): @9<72

Next point of polyline. Press Enter when done (PersistentClose=No Mode=Line Helpers=No Length Undo): @9<144

Aula. 2 – RHINO

Comandos

Quando queremos ativar o Ortho On quando desenhamos uma linha carregar no shift

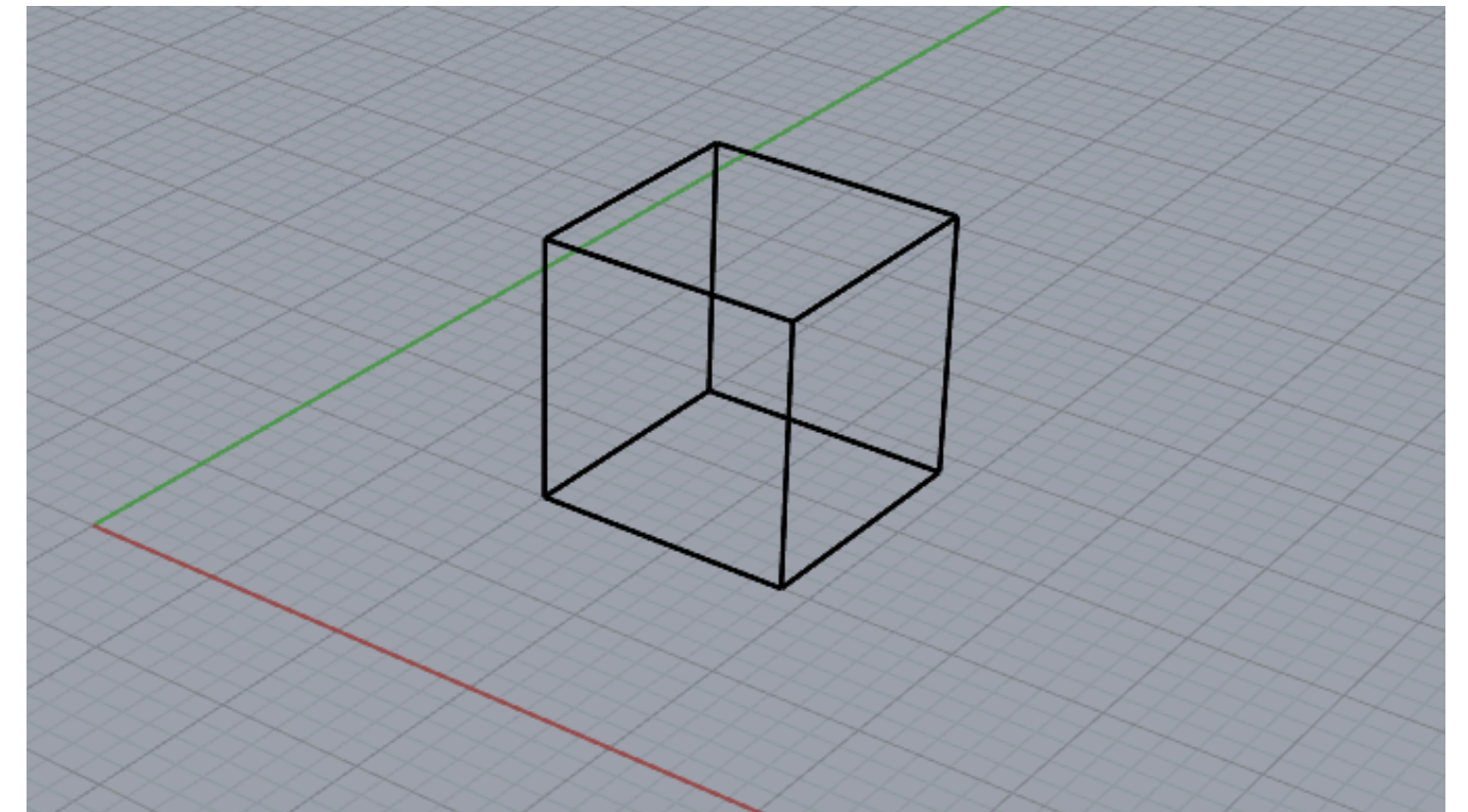
Para Usar Undo- U

Para Polyline- Poly

Exercício 2- Fazer um cubo

Primeiro com o método box e depois com extrude

Box



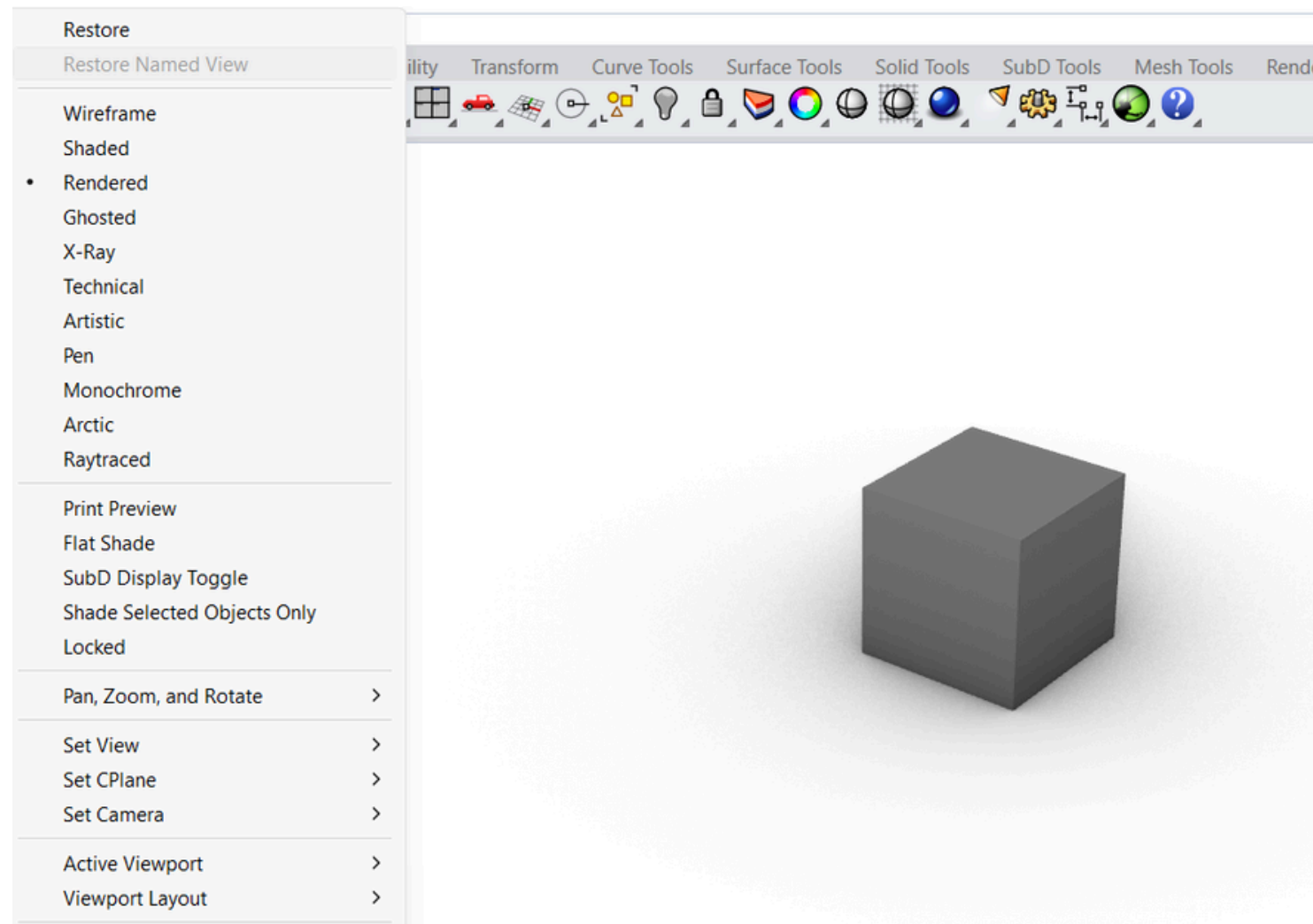
Coordenadas:

9,9

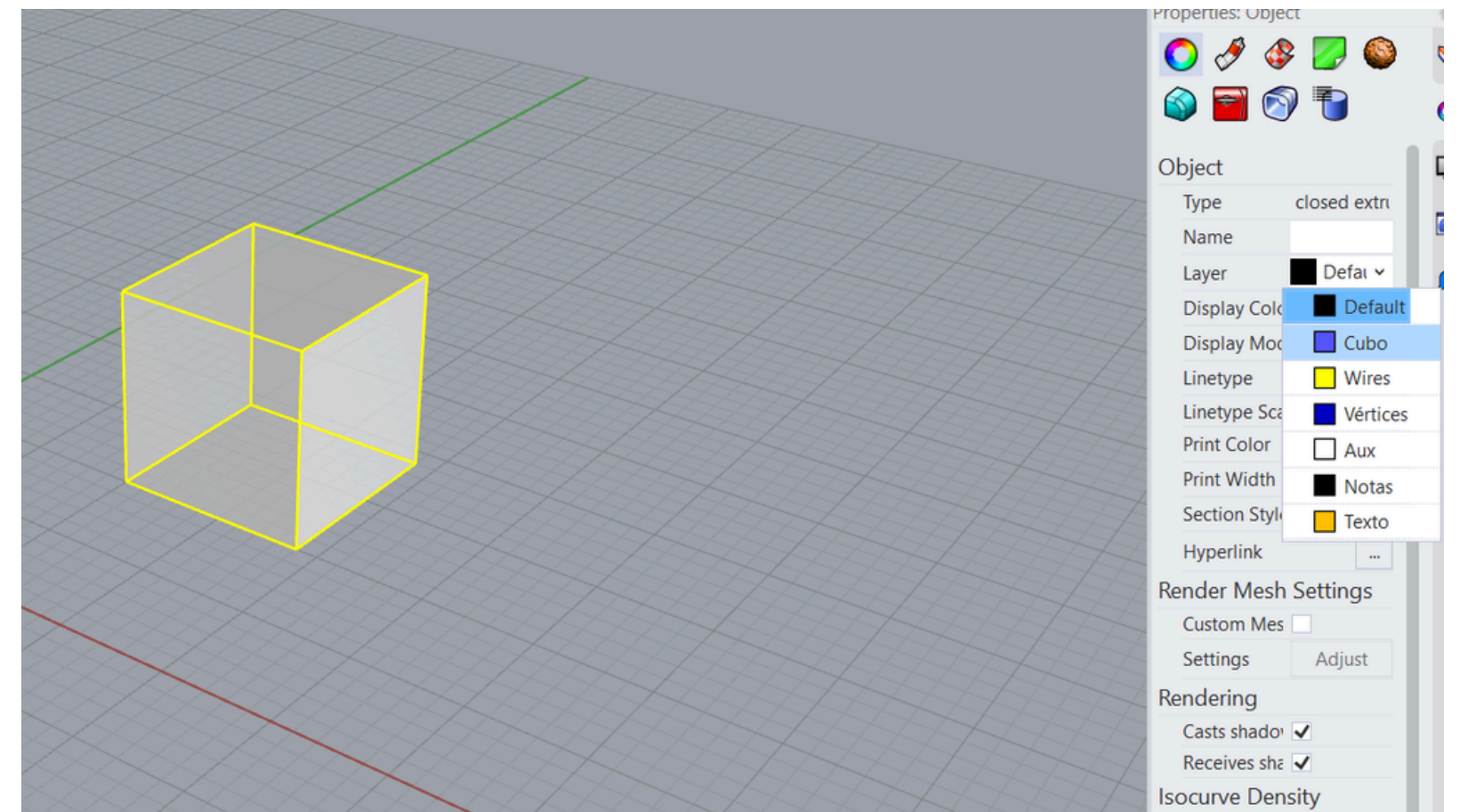
@9,9

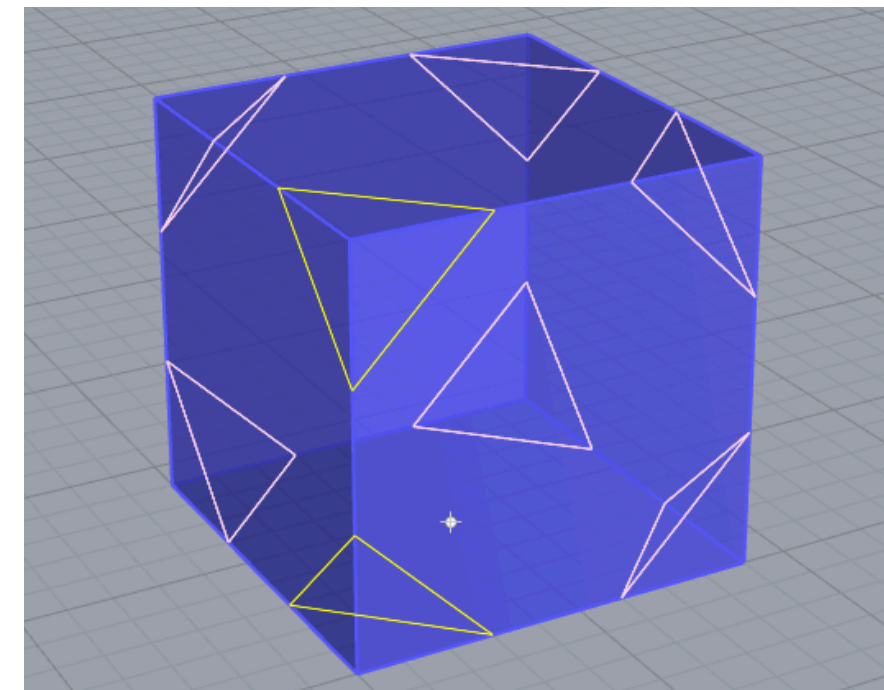
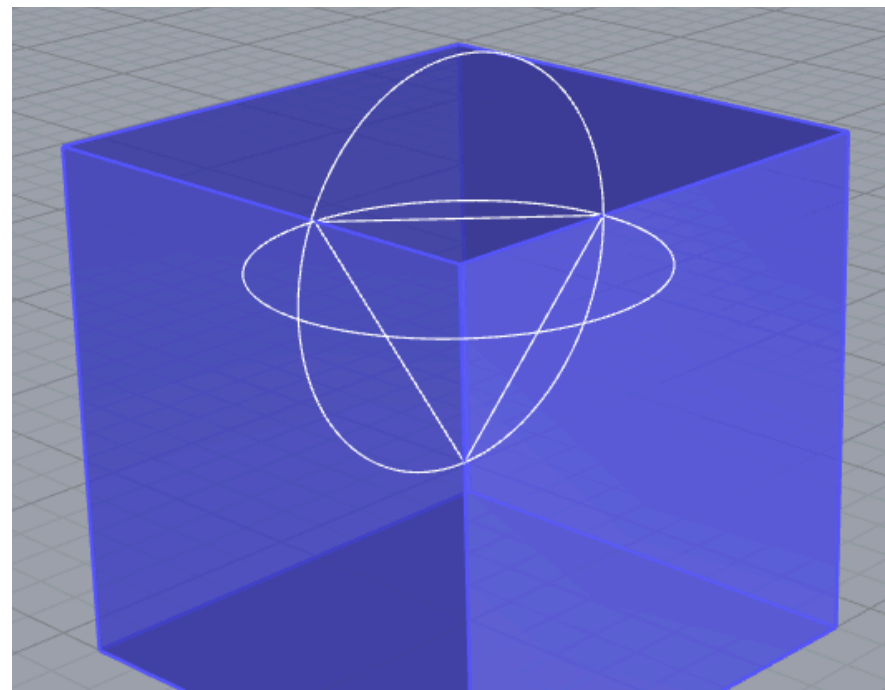
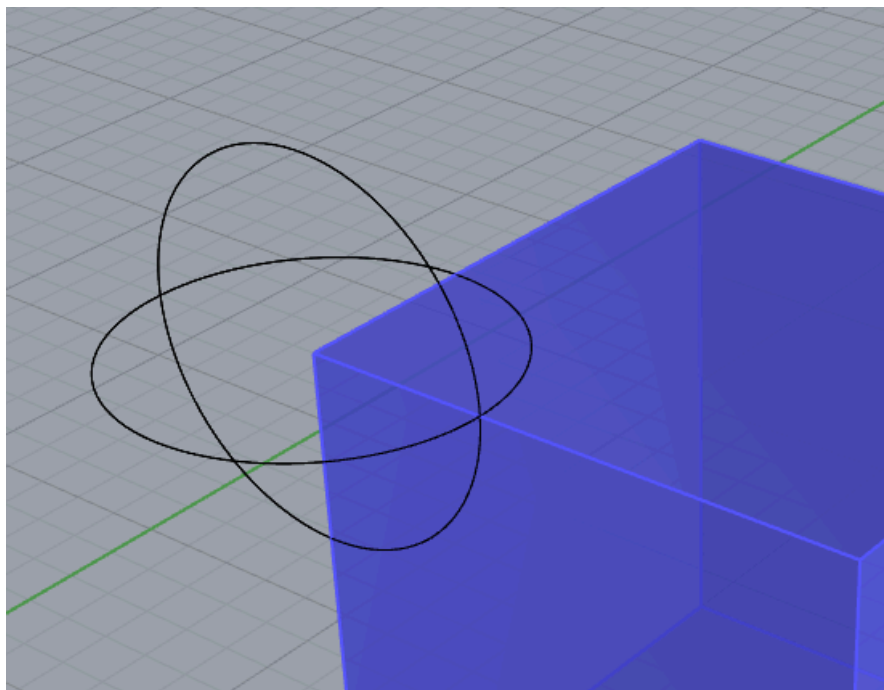
9- Extrude do Cubo

Opções de Visualização

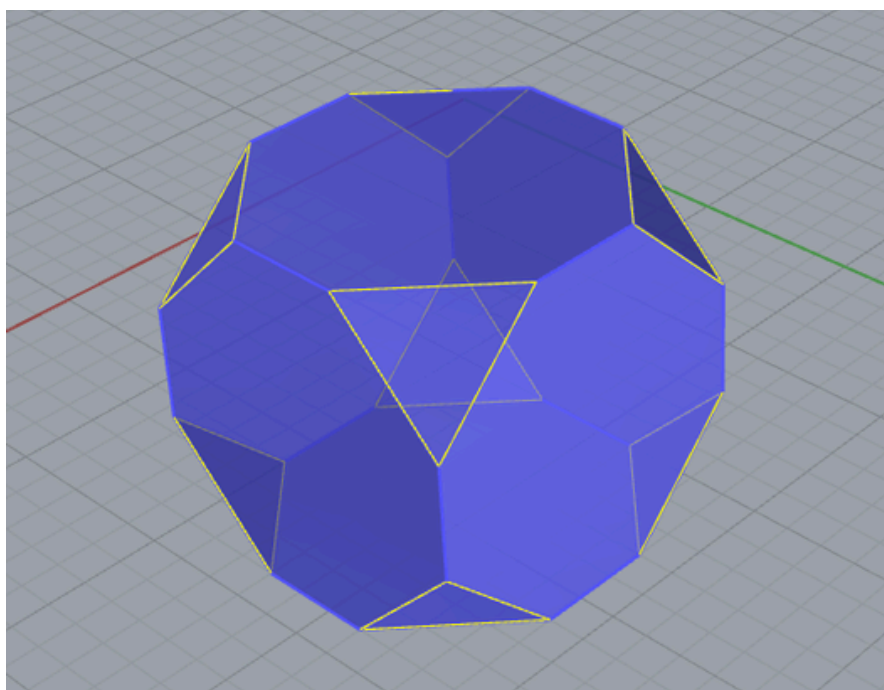


Mudar de Layer Selecionar antes o Cubo

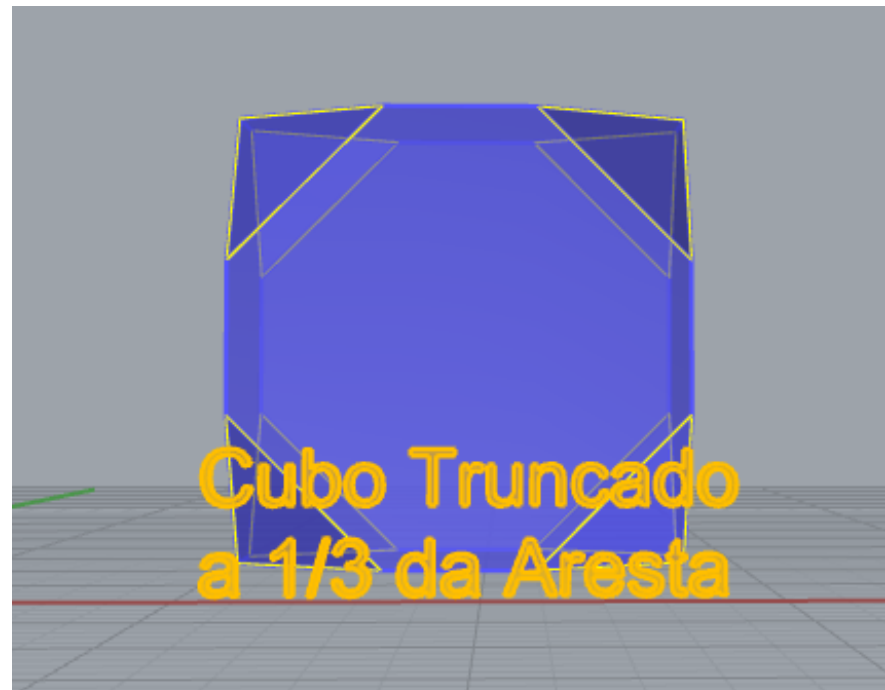




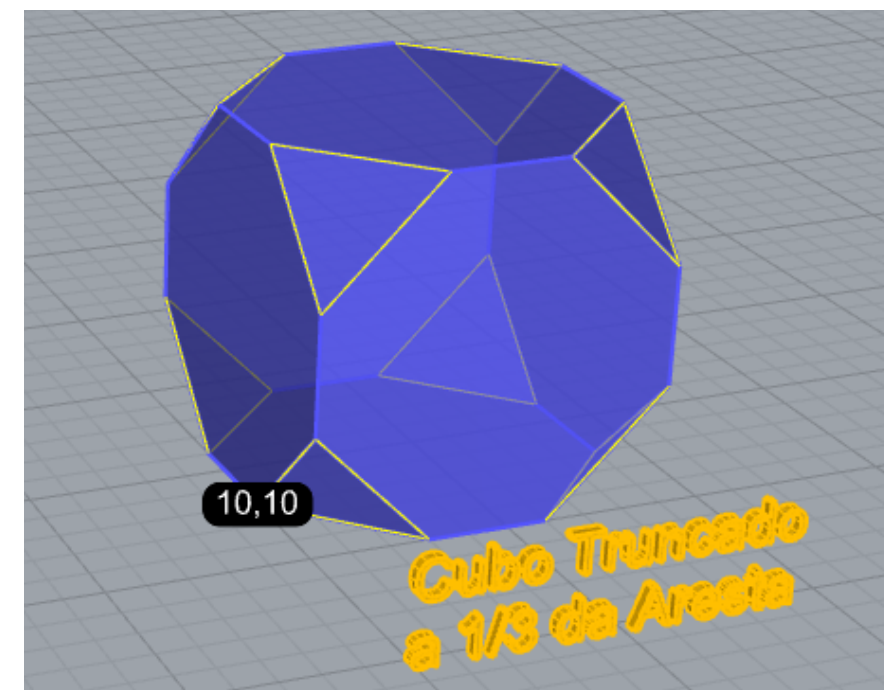
Mirror e ArrayPolar



WireCut

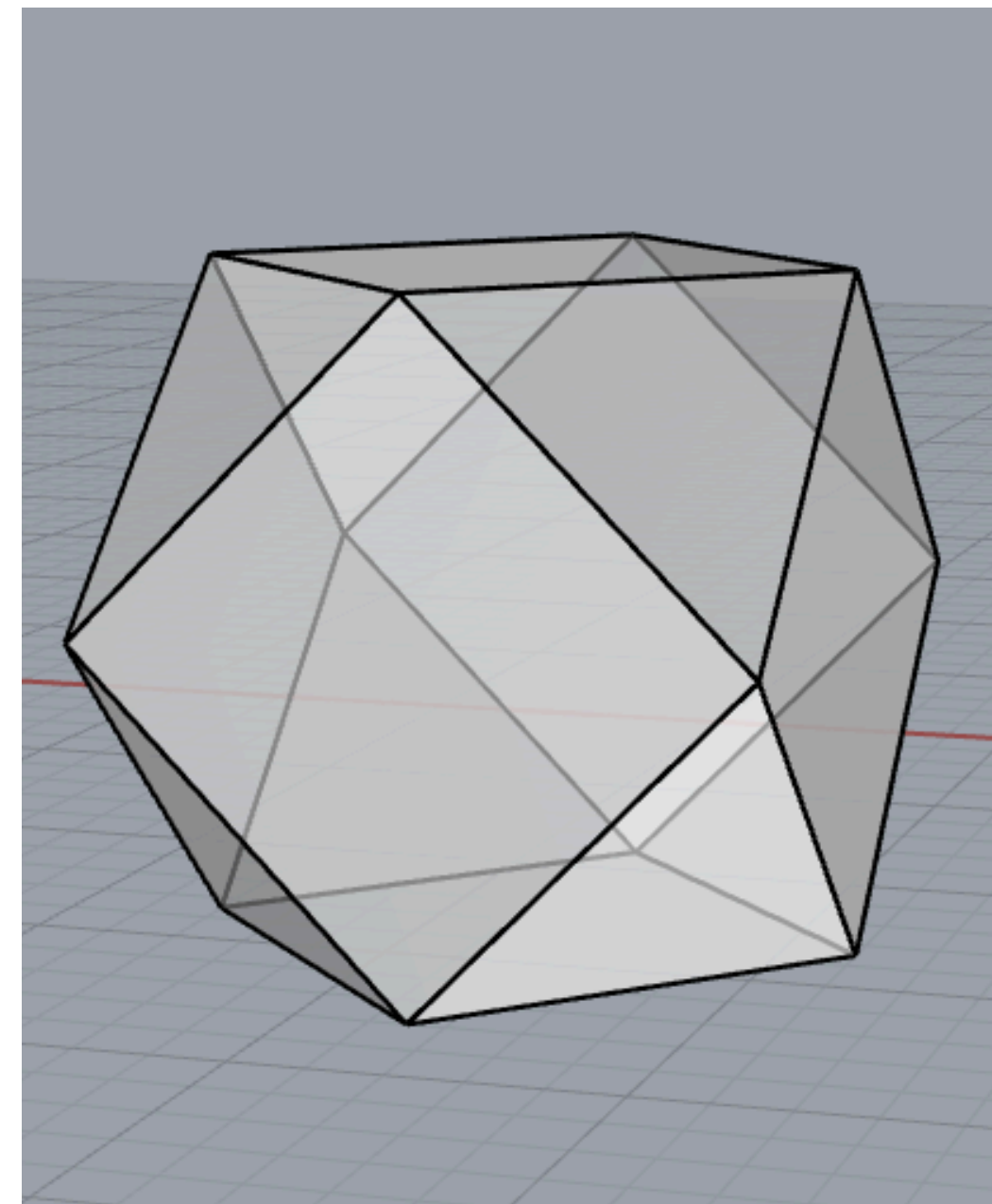
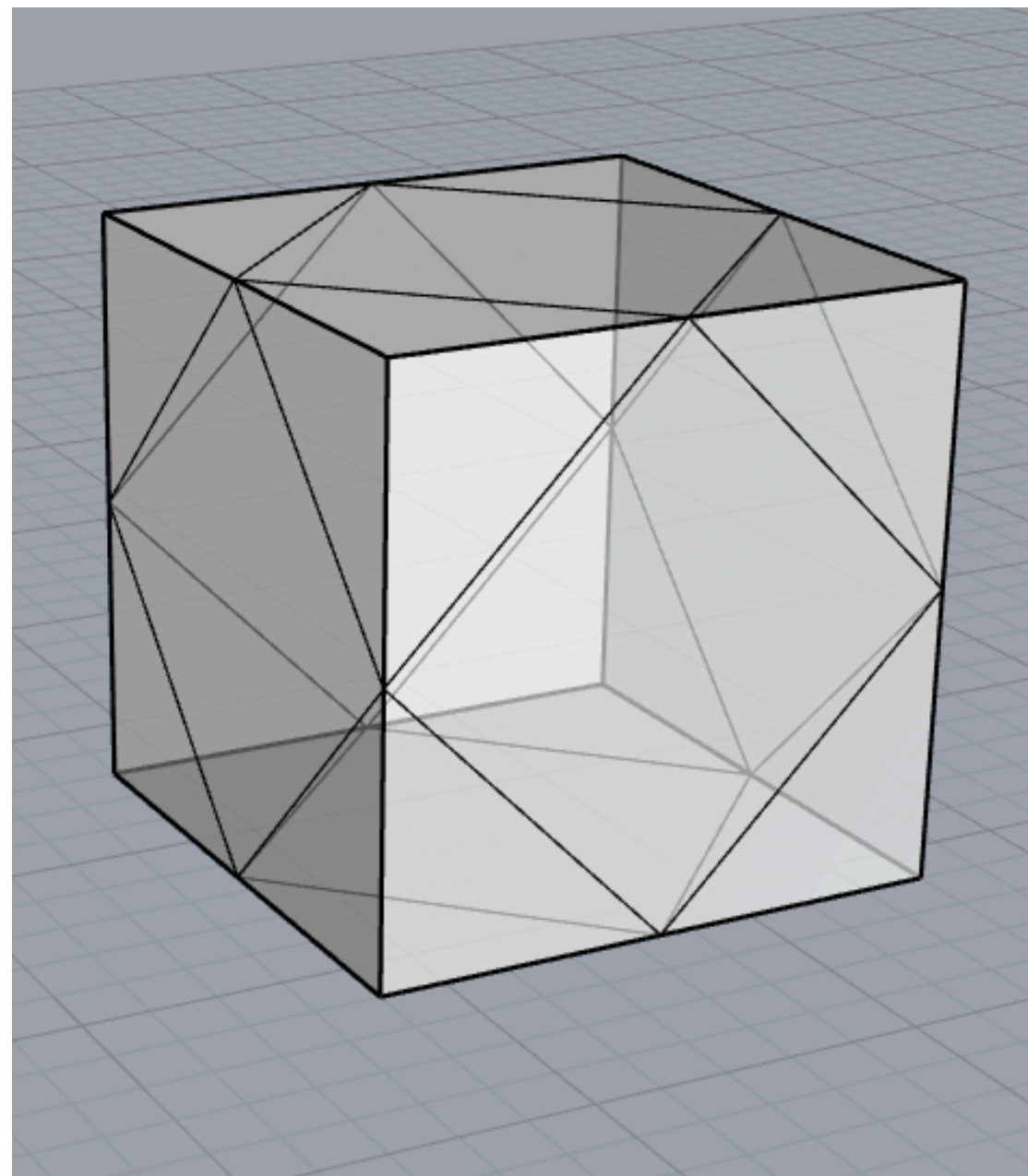
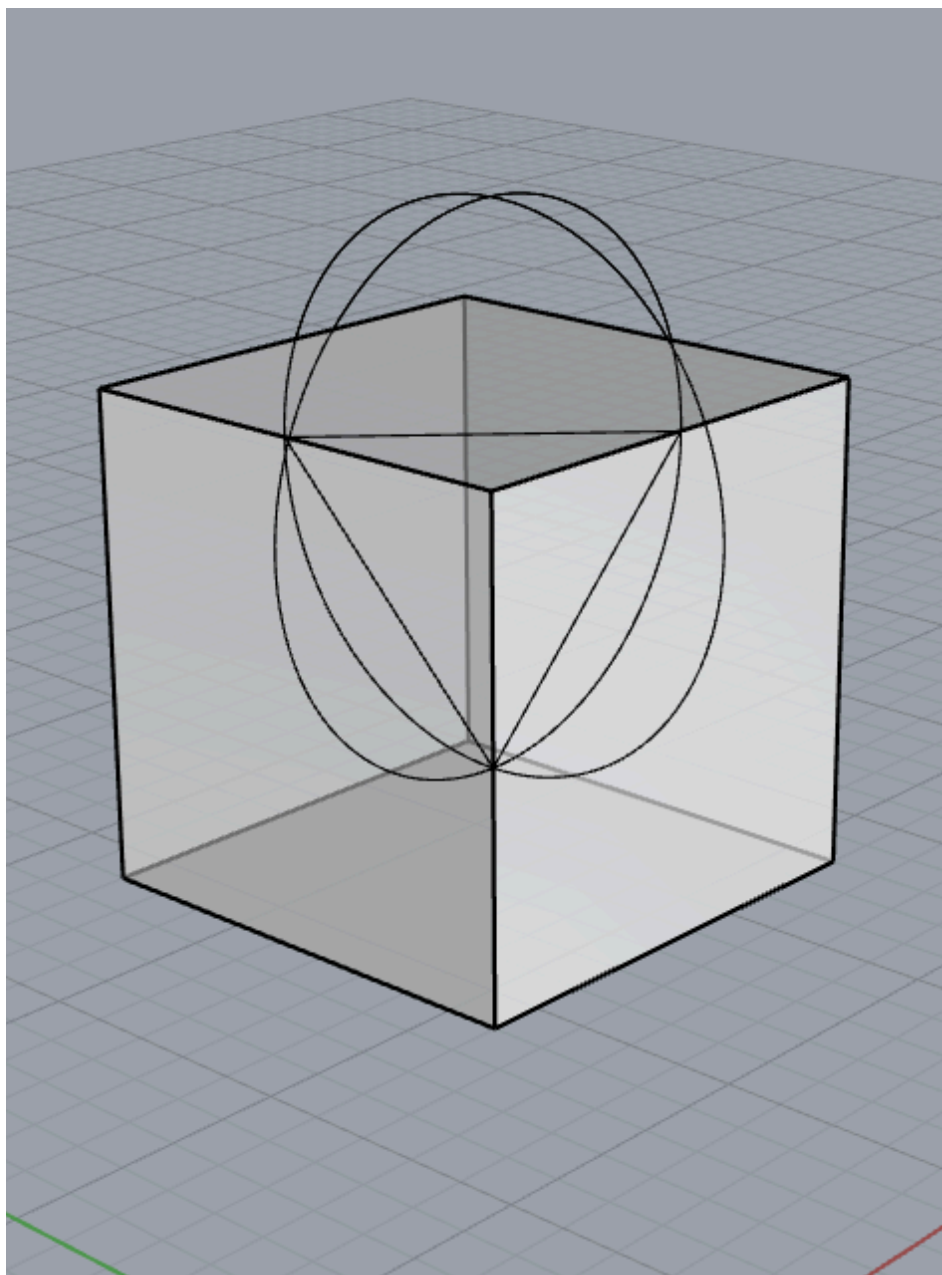


Cubo Truncado
a 1/3 da Aresta



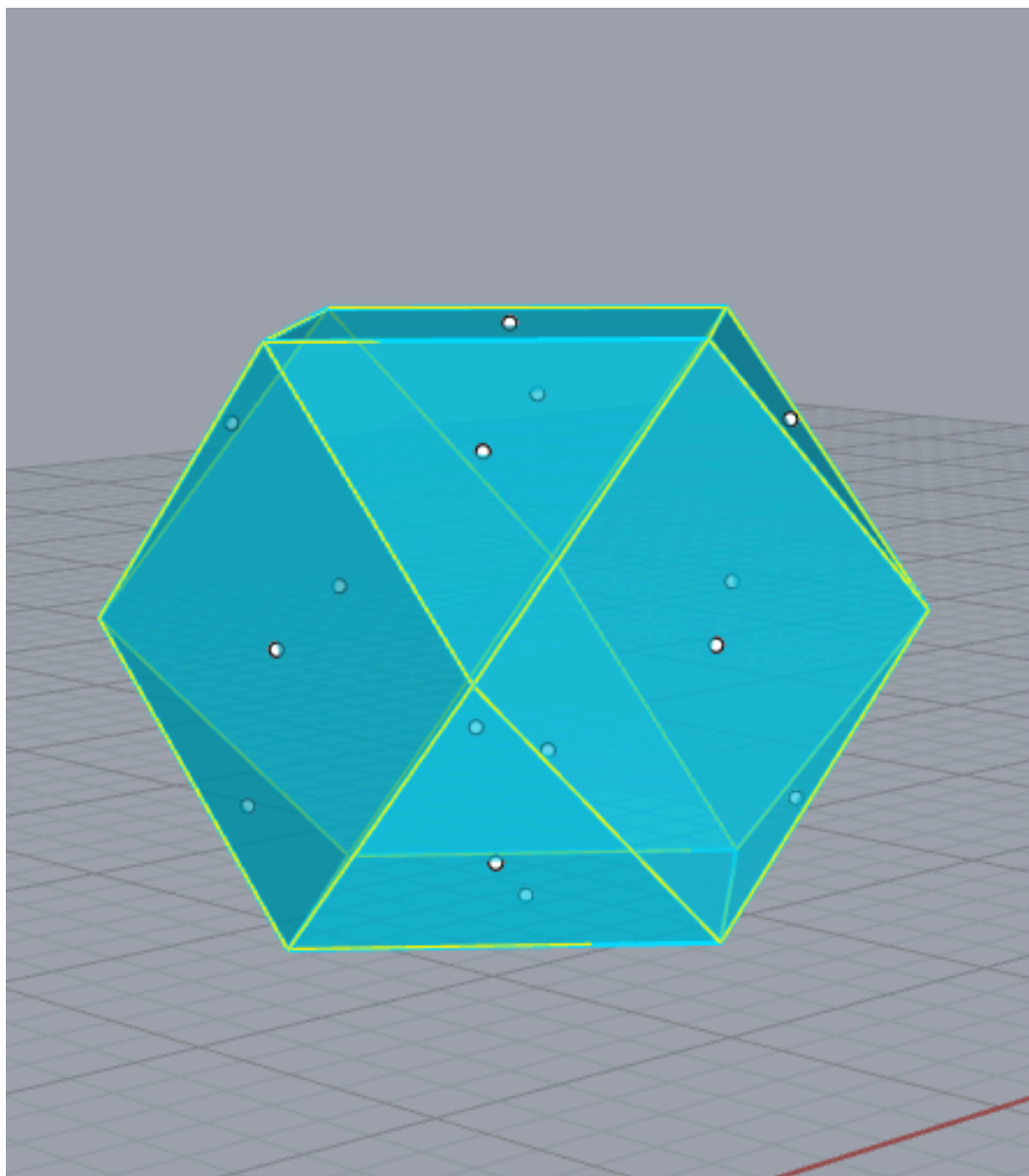
10,10

Cubo Truncado
a 1/3 da Aresta

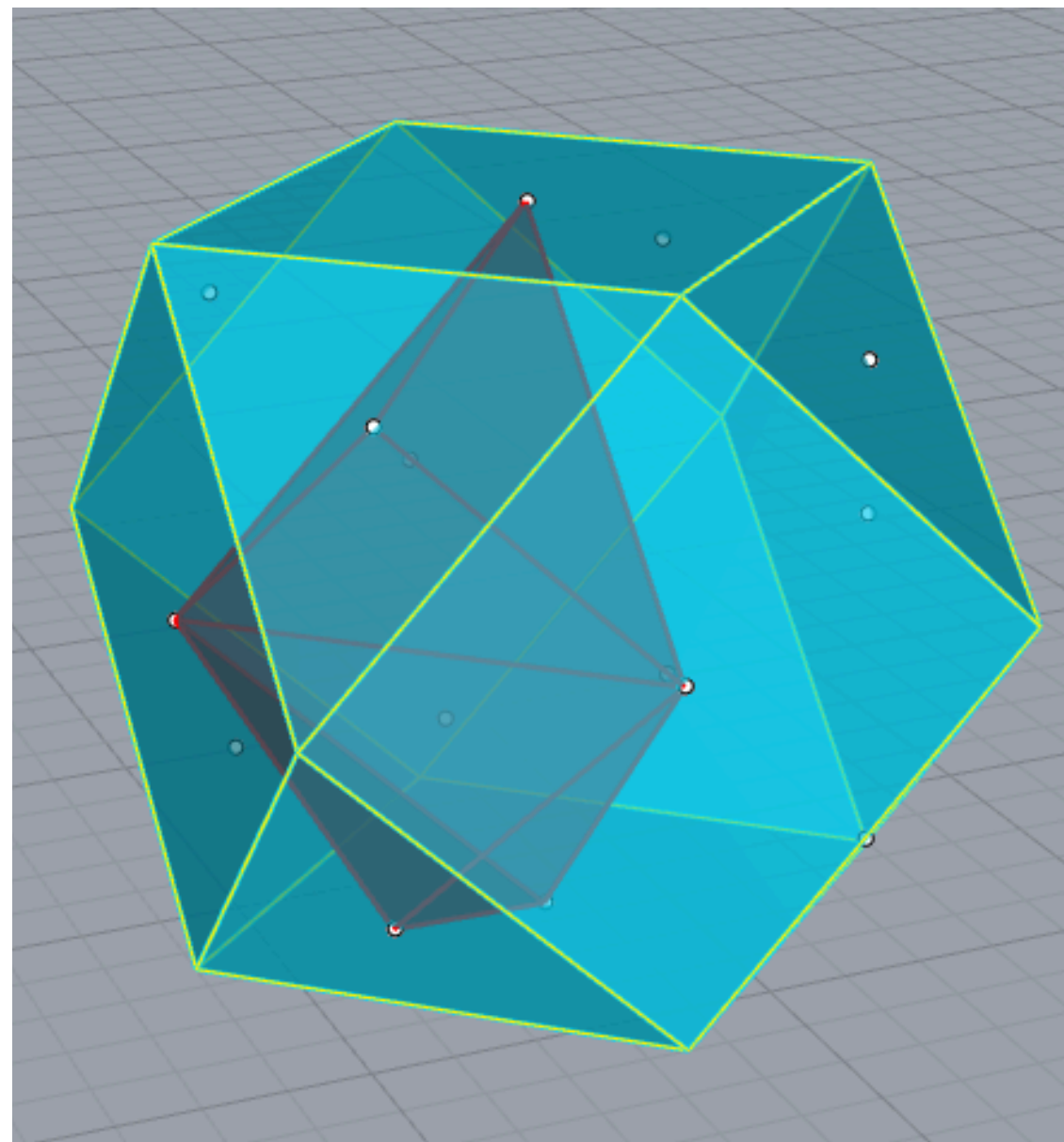


Cubo Troncado a metade

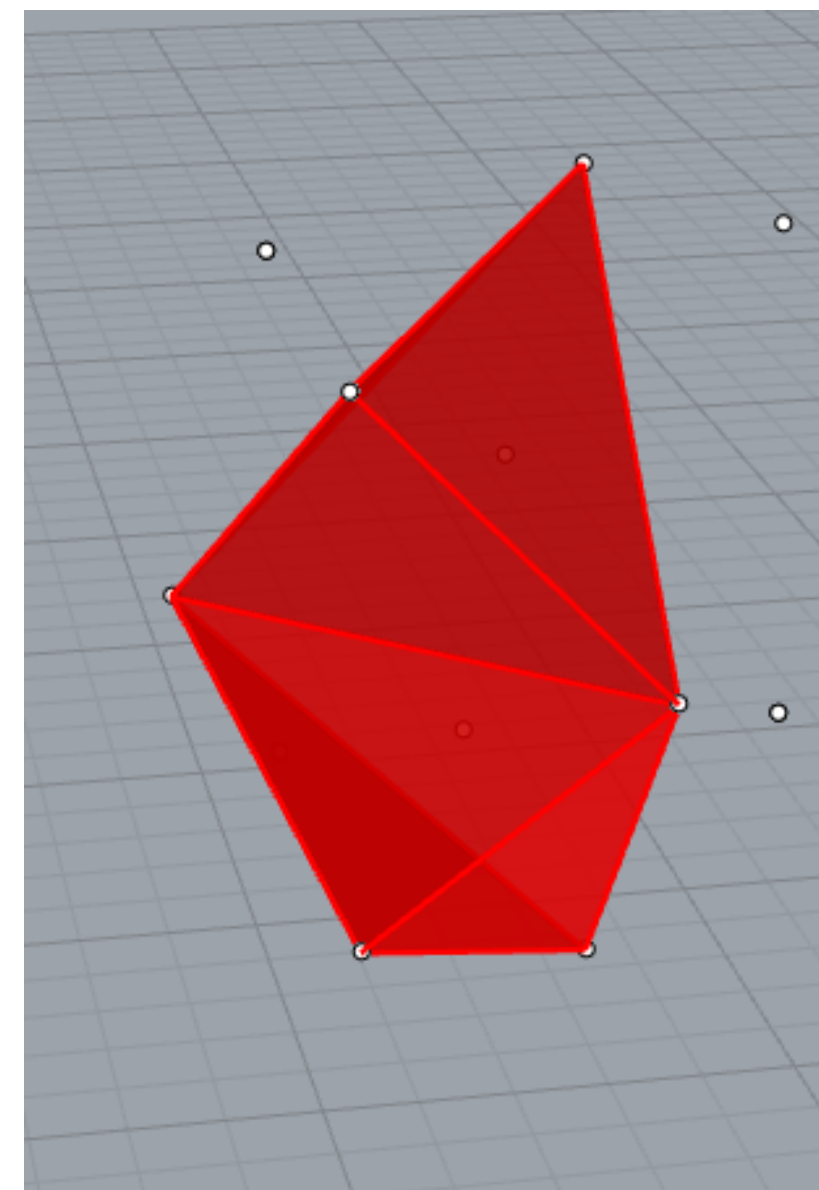
Trabalho_Casa



colocar pontos em todas as faces

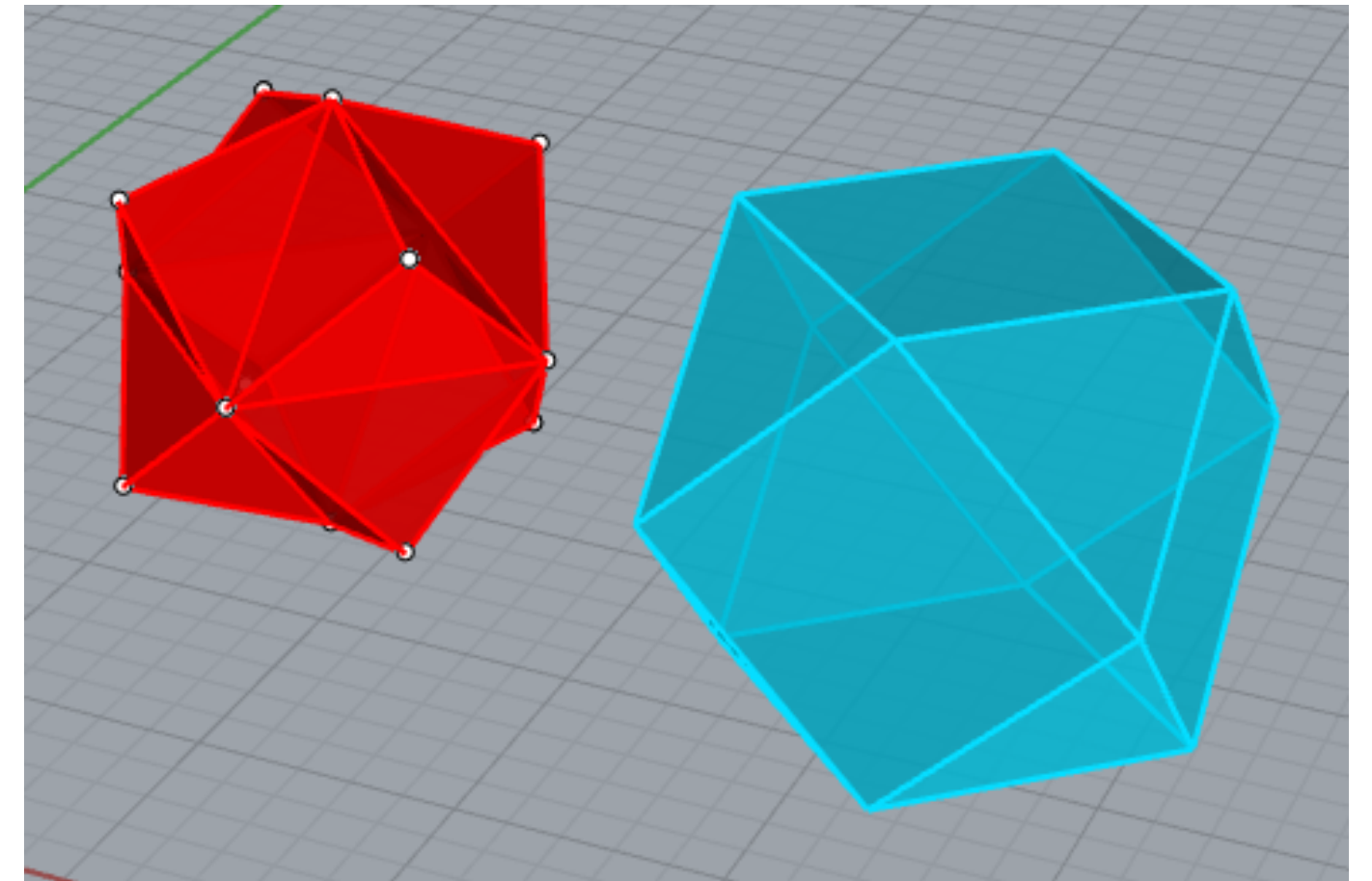
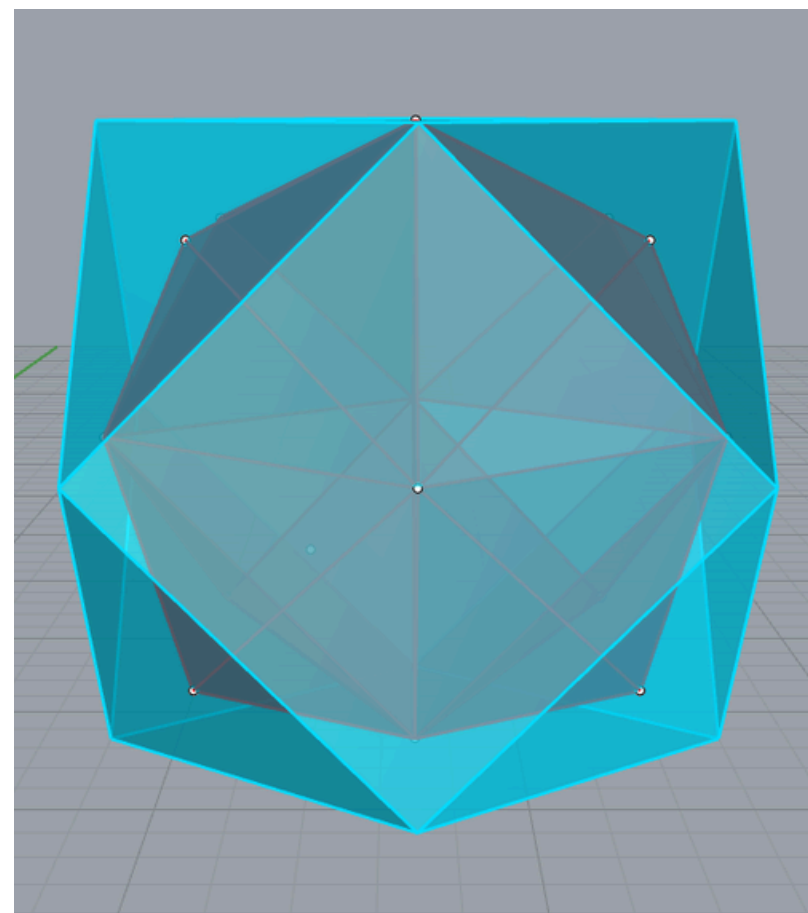
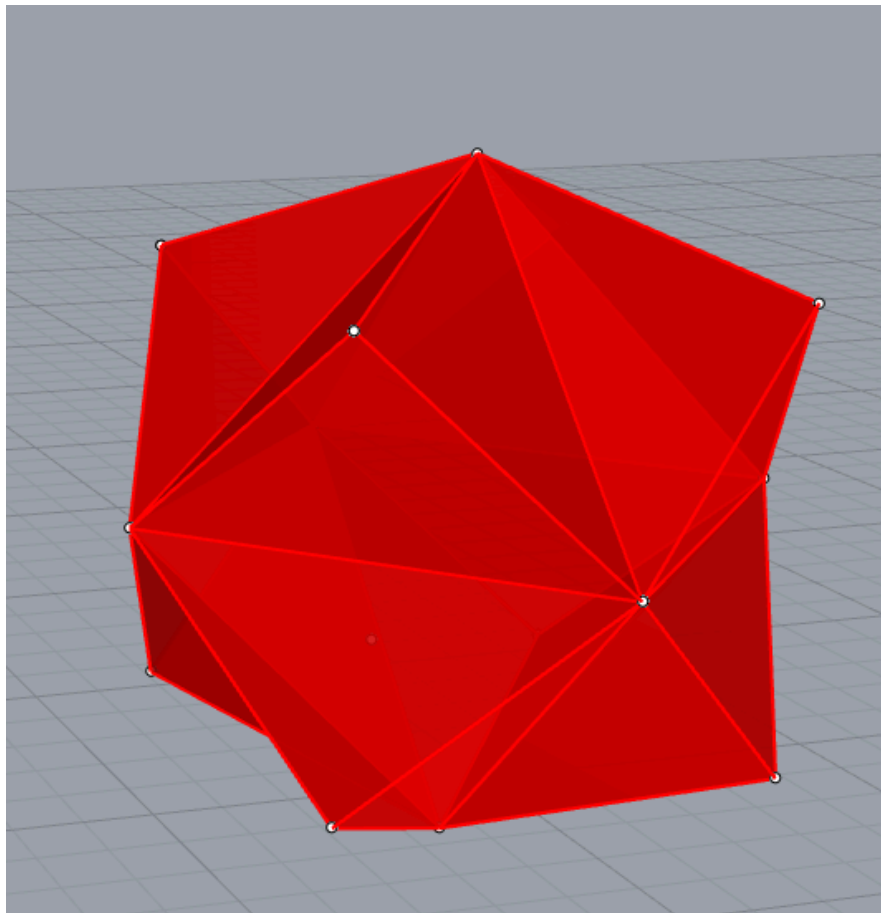


Unir Linhas e Usar comando surface

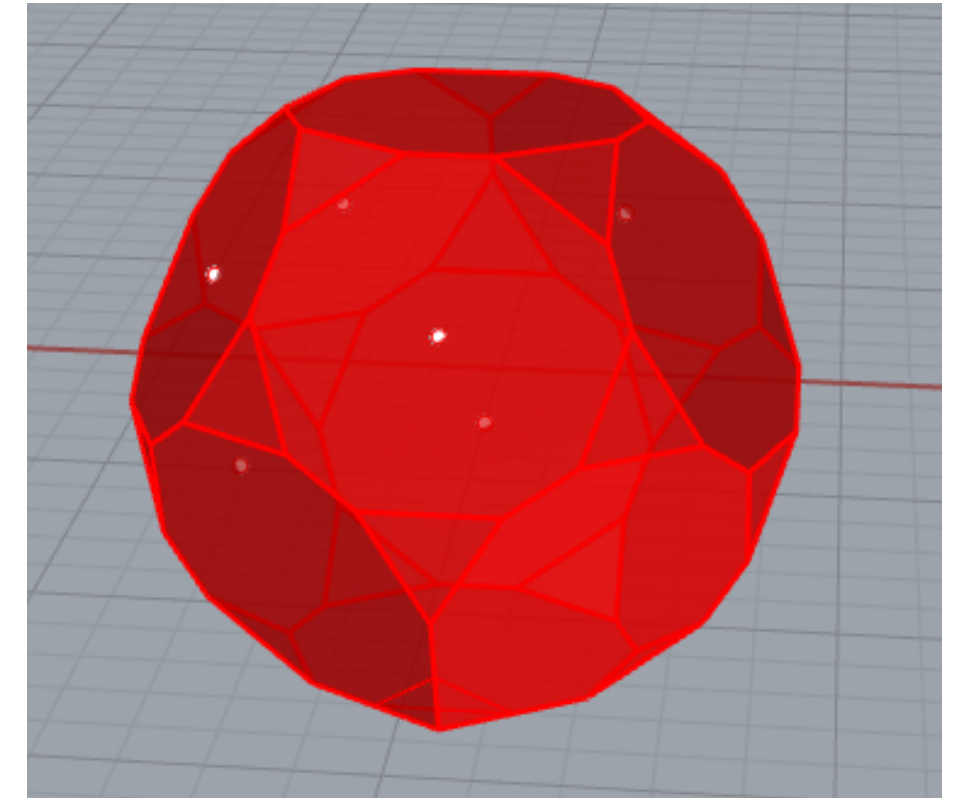
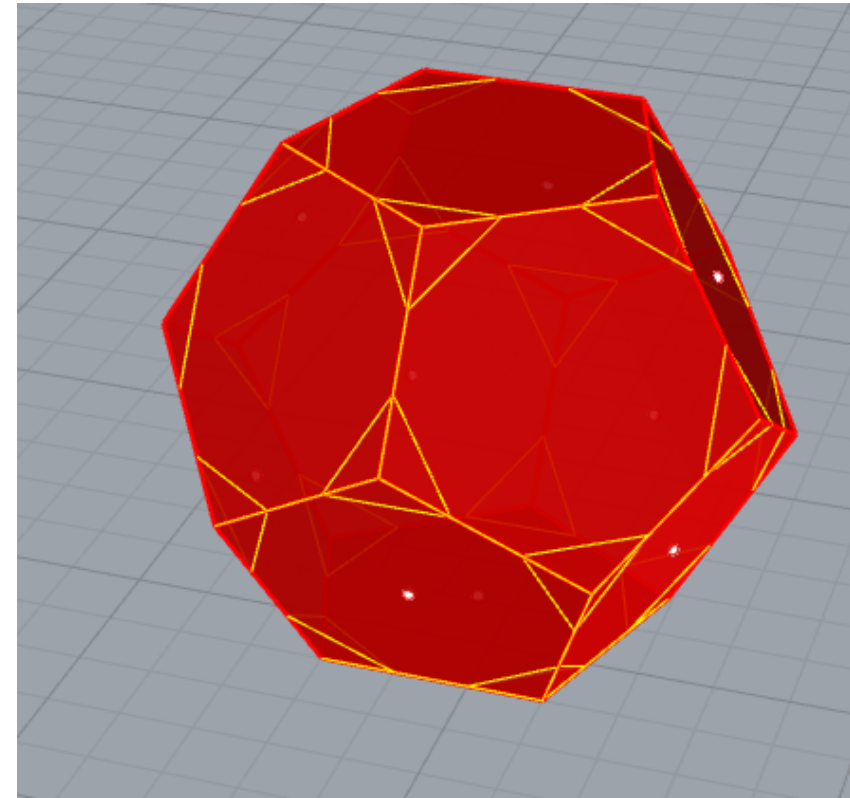
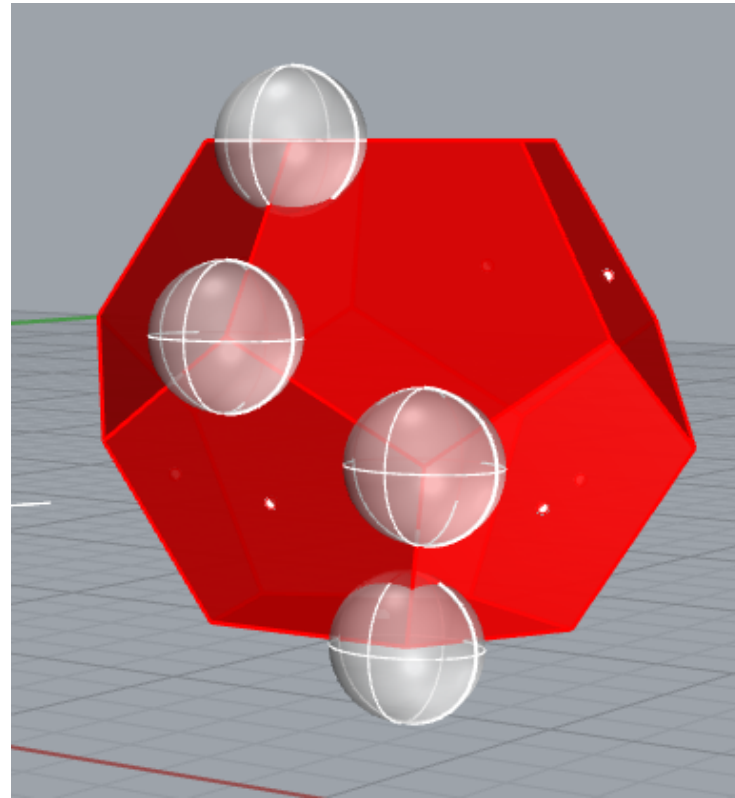
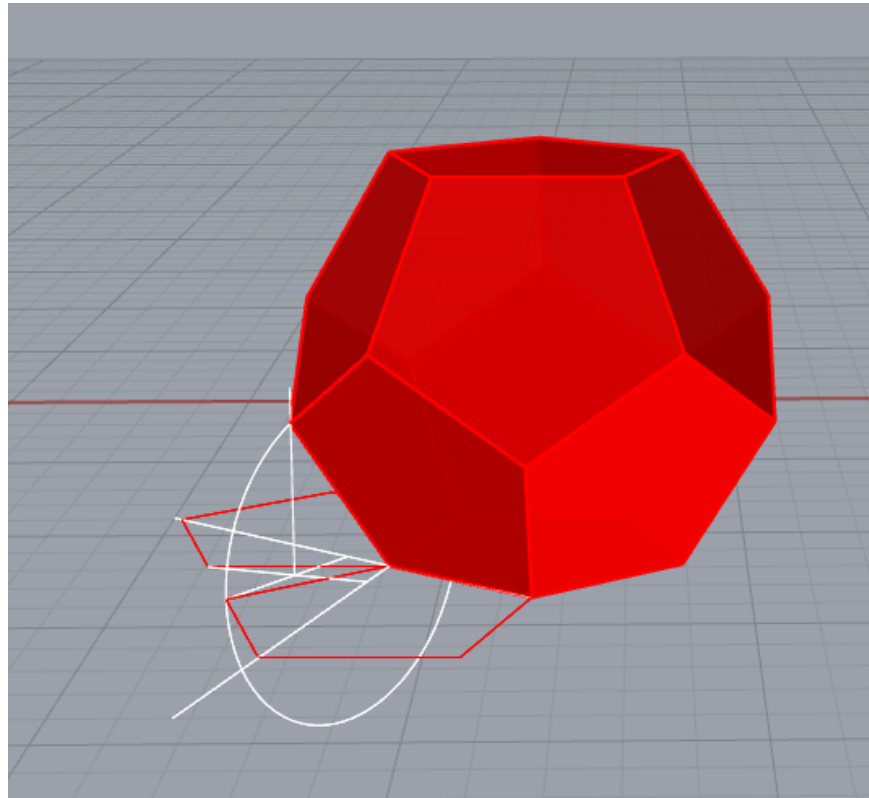


Aula. 3 – RHINO

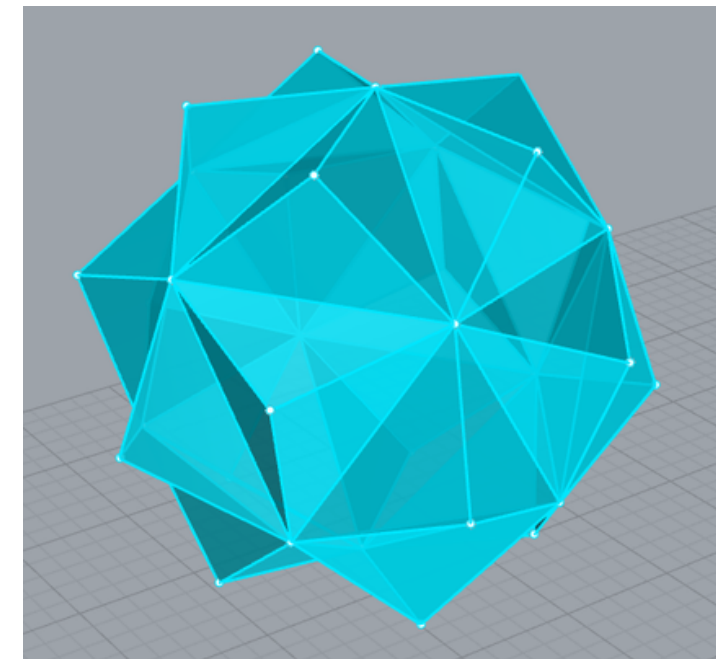
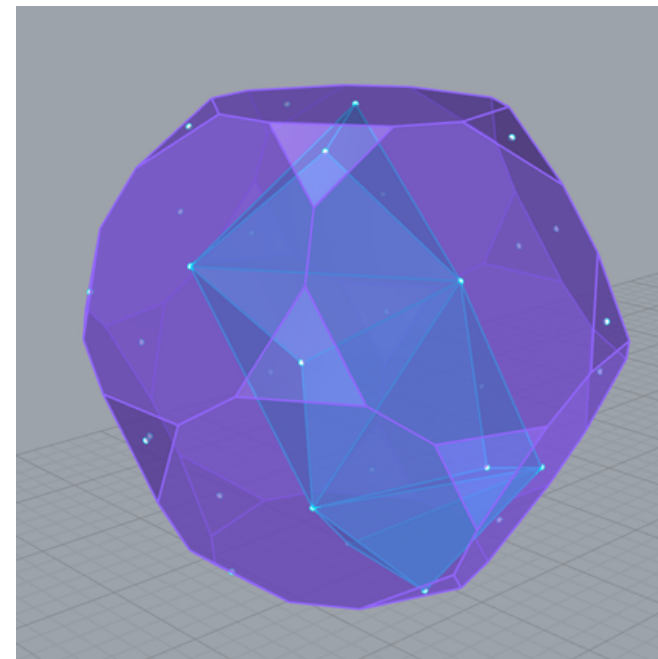
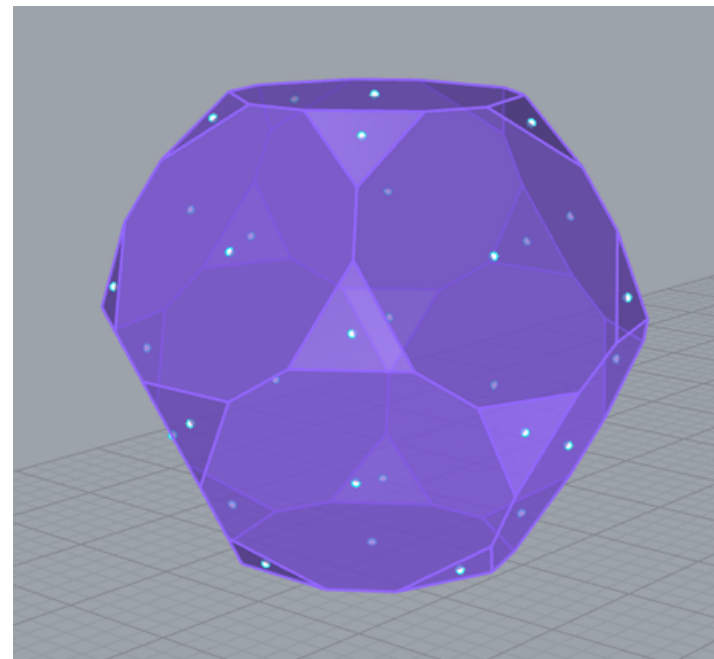
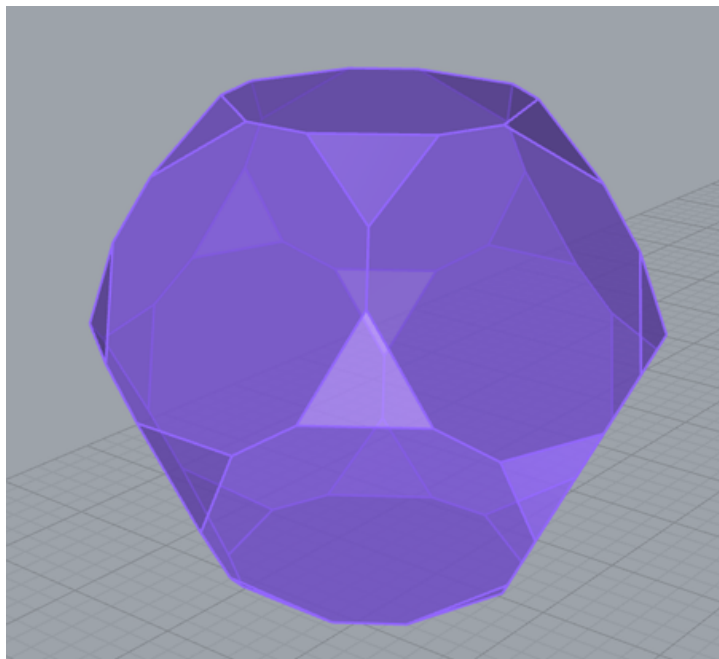
Fazer ArrayPolar



Dodecaedro e Dodecaedro Troncado

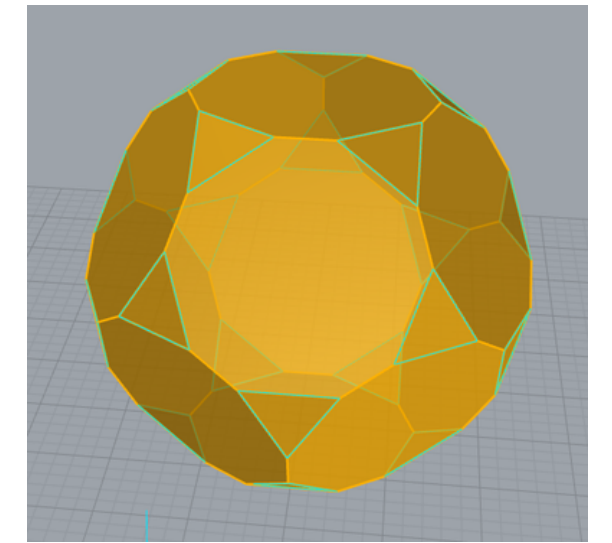
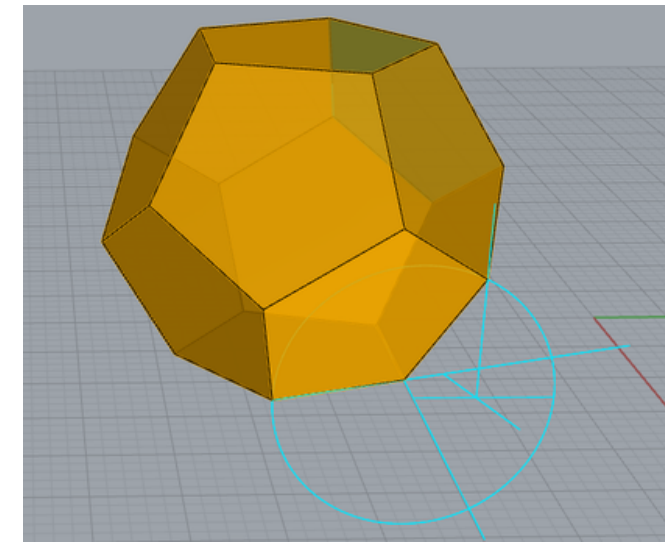
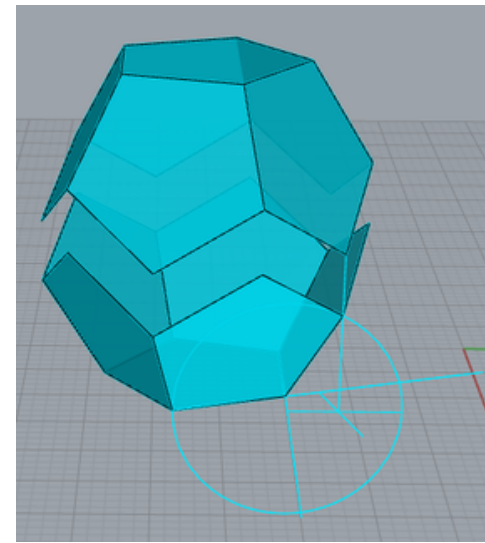
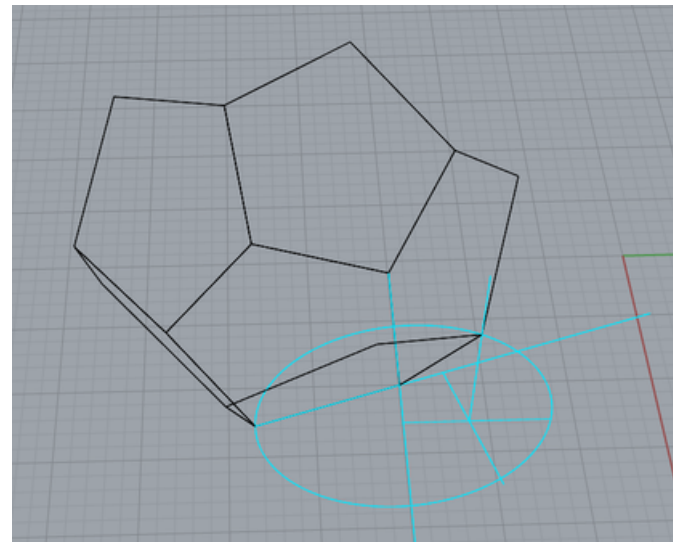
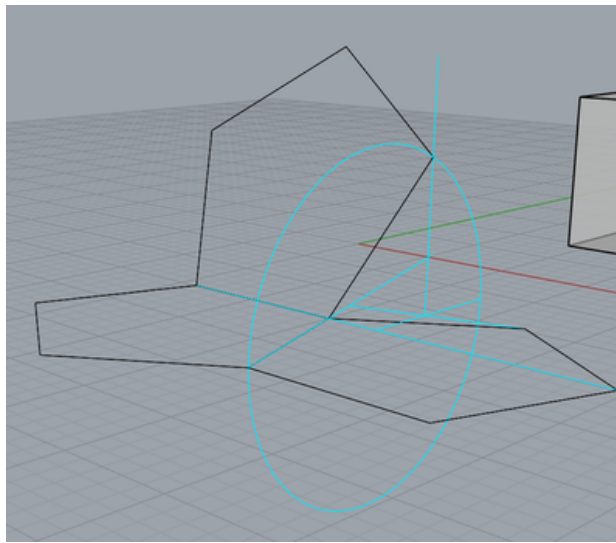


Dual Dodecaedro



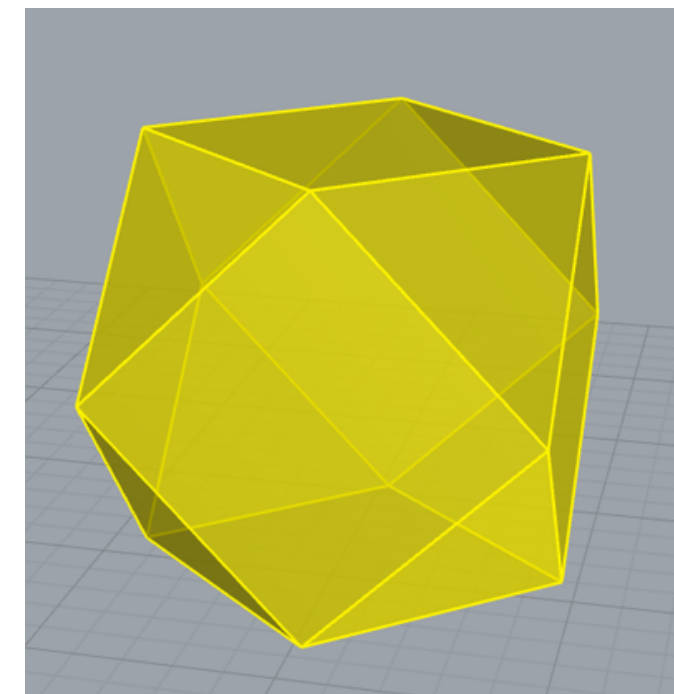
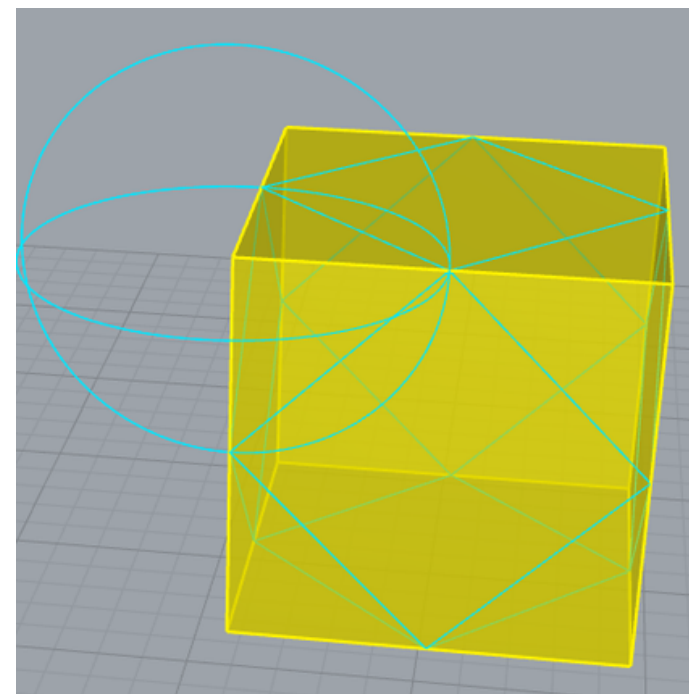
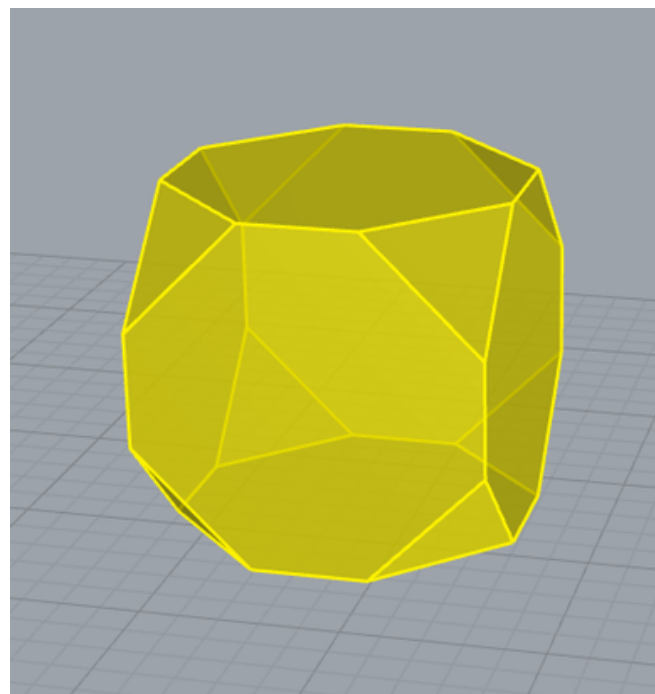
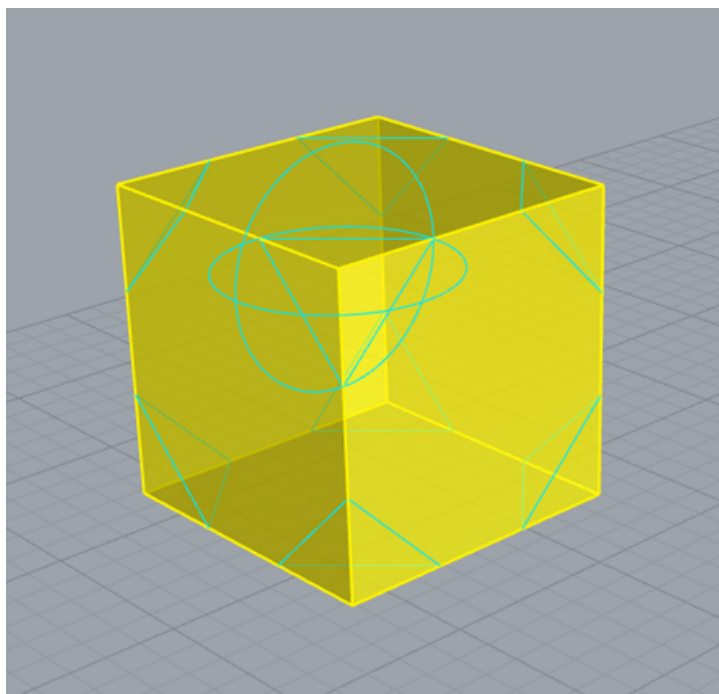
Trabalho 1 Desenvolvimento – RHINO

Repetição Dodecaedro e Dodecaedro Troncado

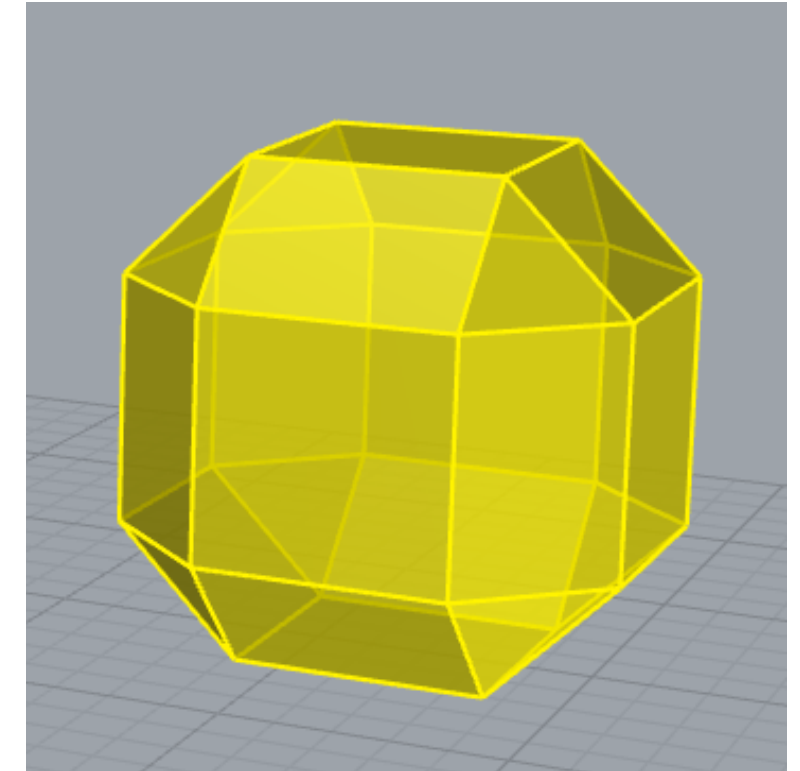
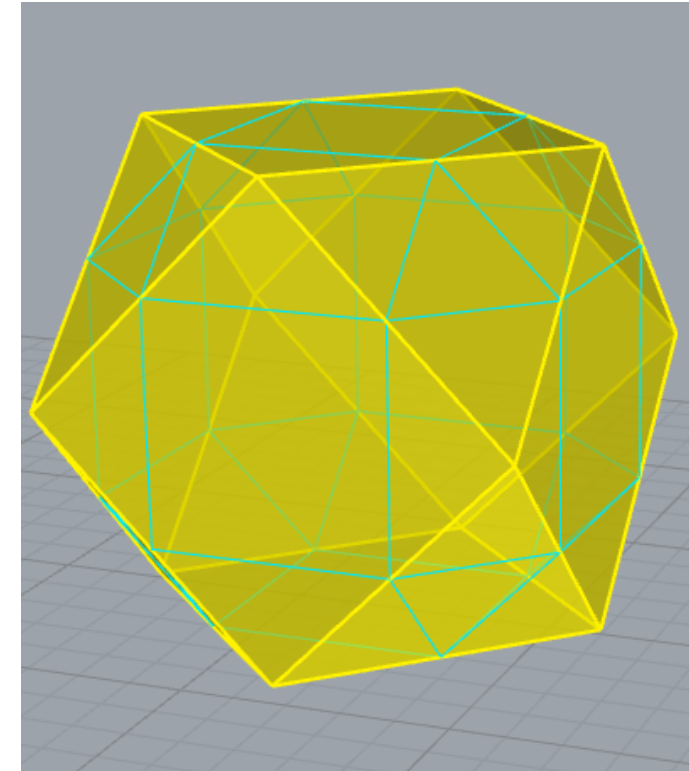
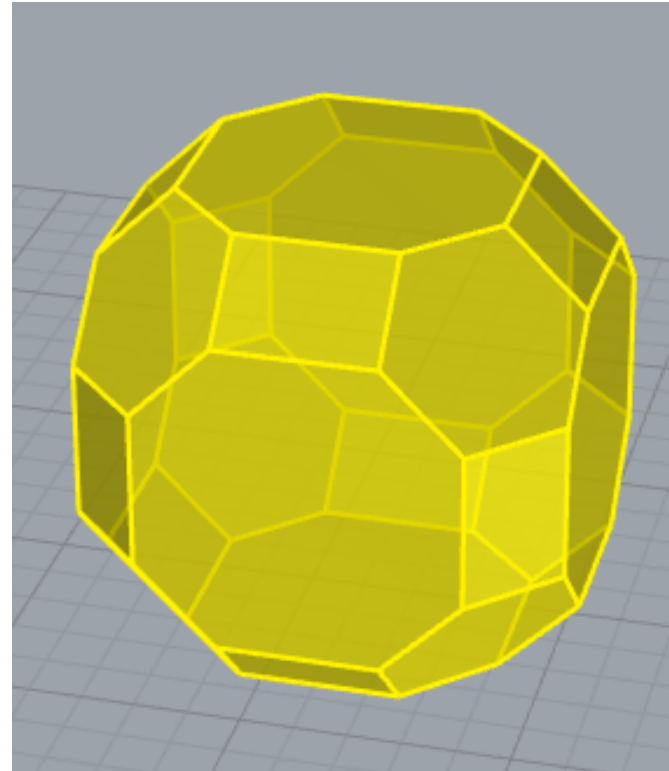
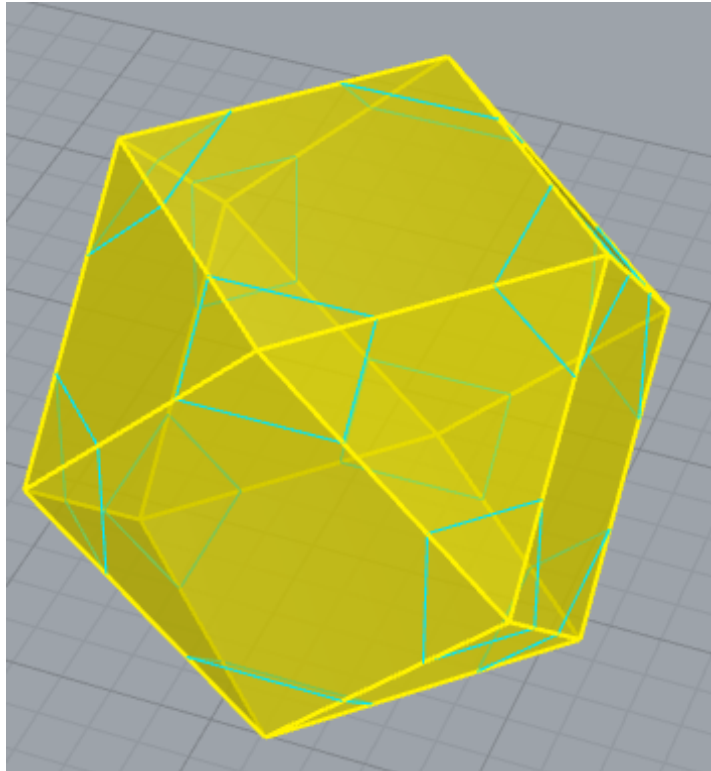


Trabalho 1 Desenvolvimento – RHINO

Cubo e Cubo Troncado a $\frac{1}{2}$ e metade

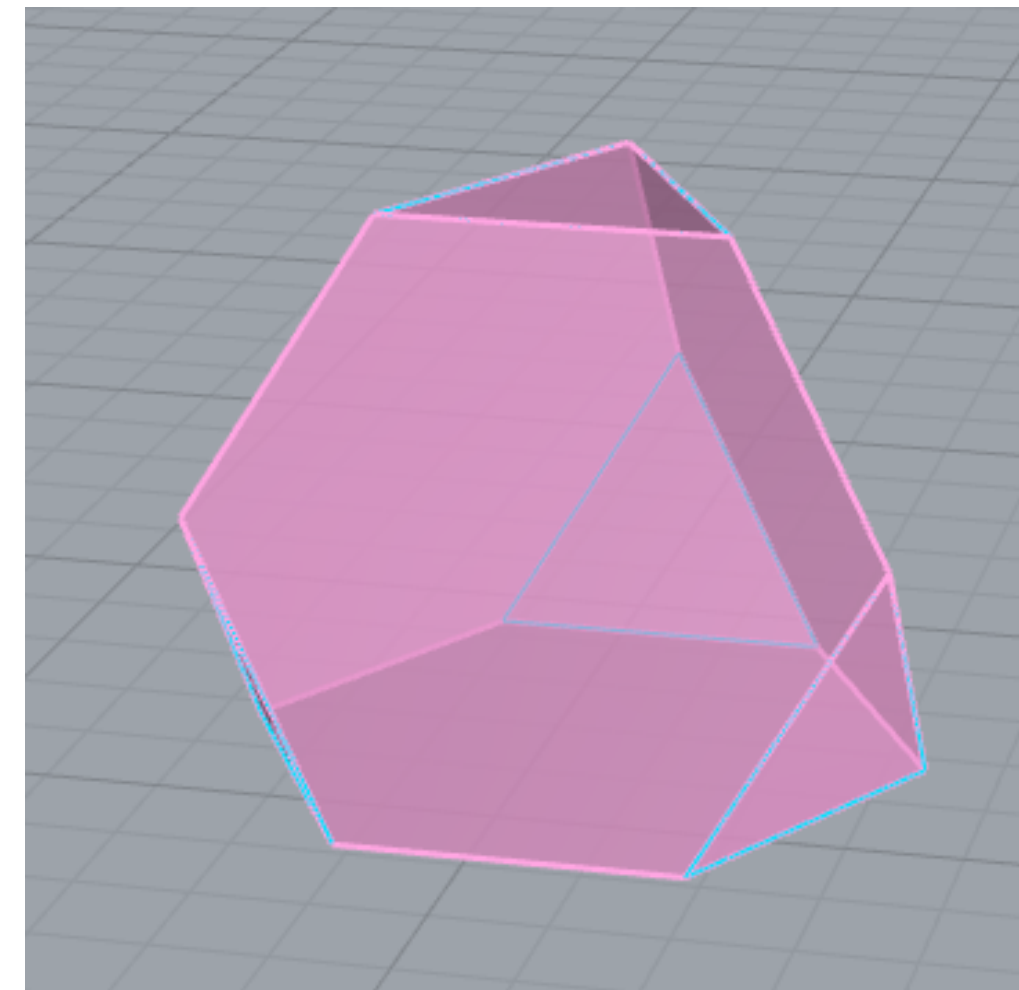
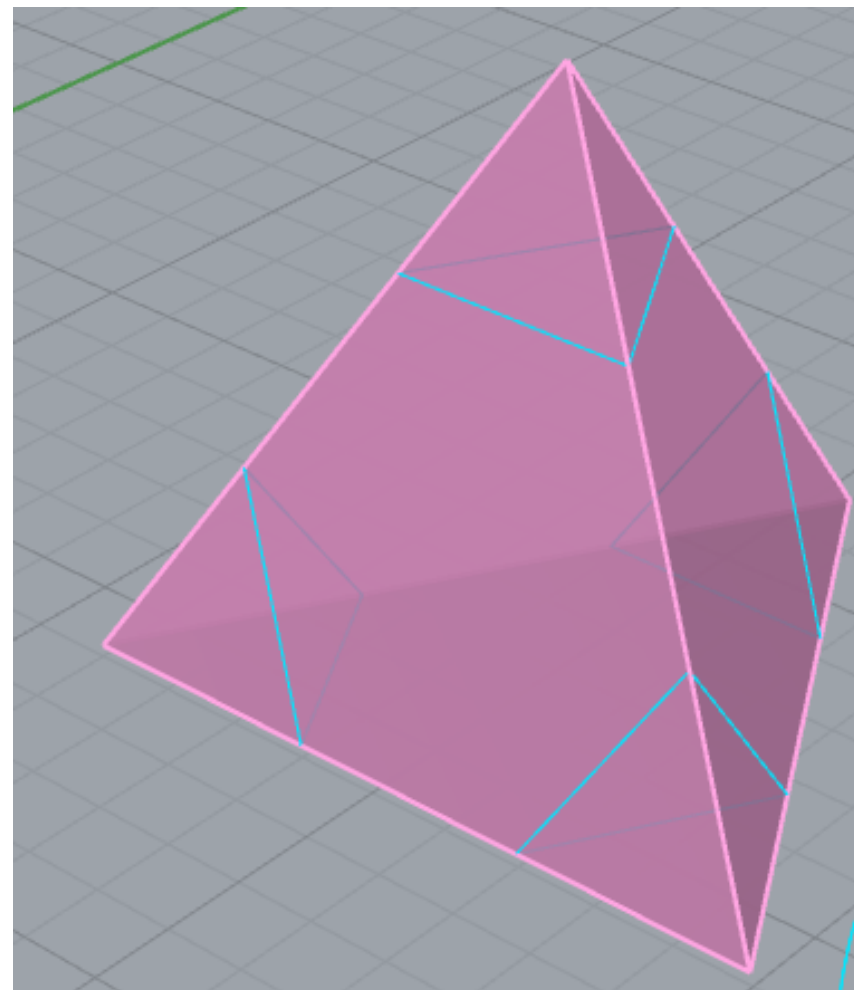
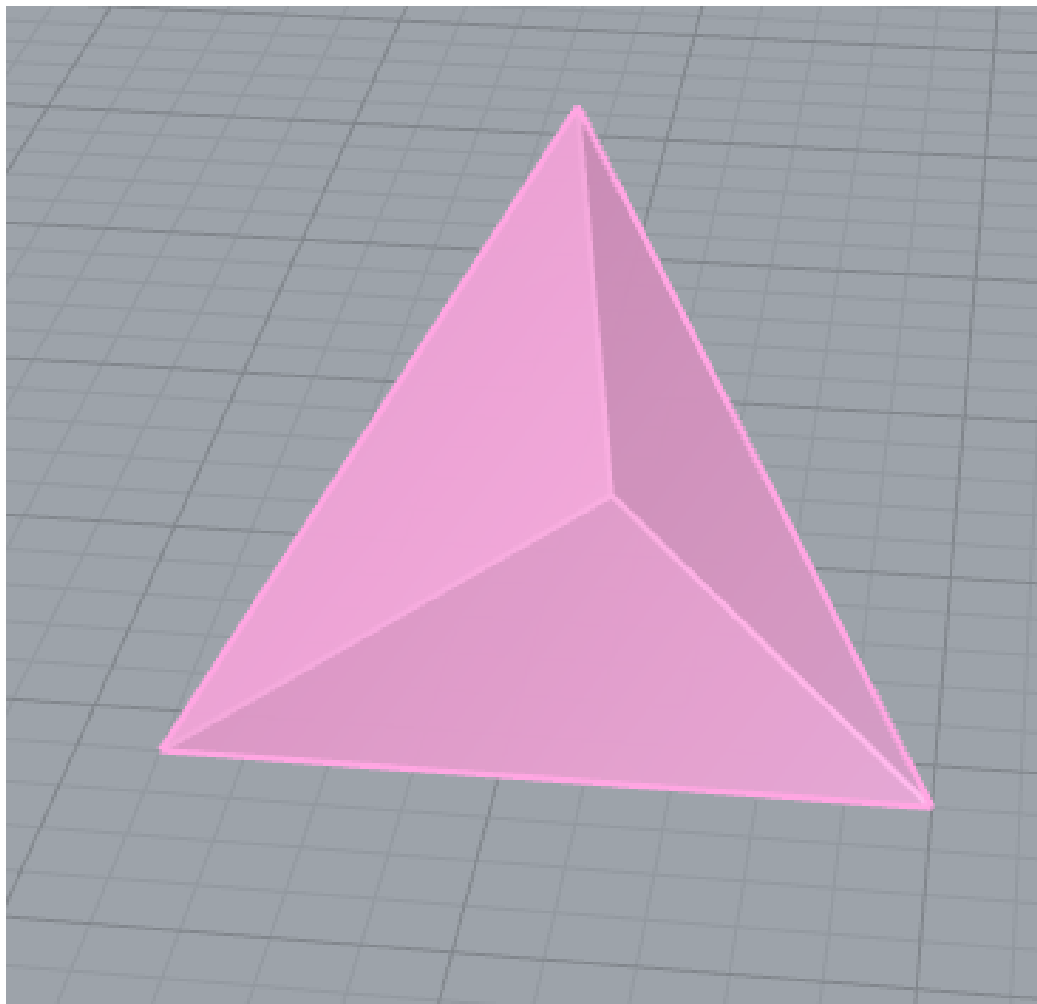


Trabalho 1 Desenvolvimento – RHINO



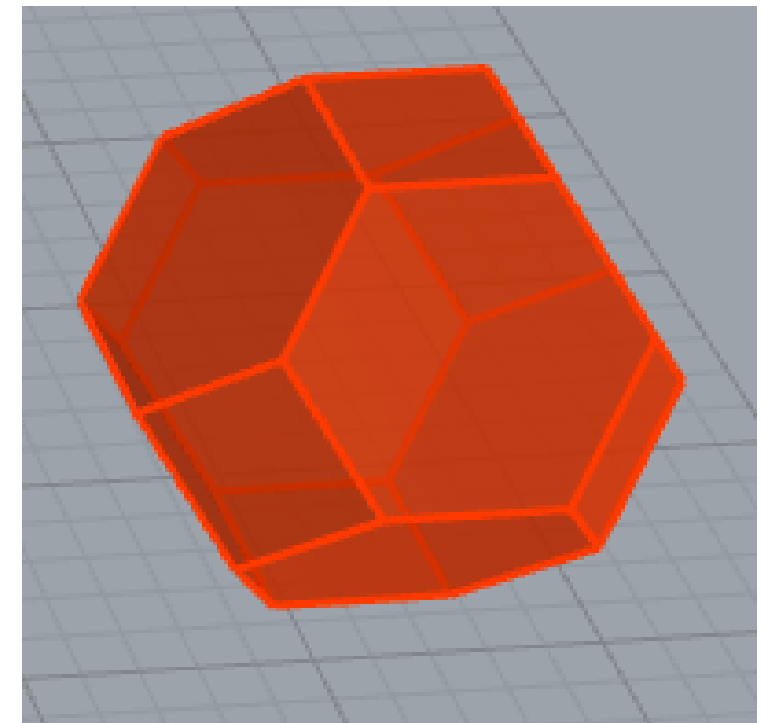
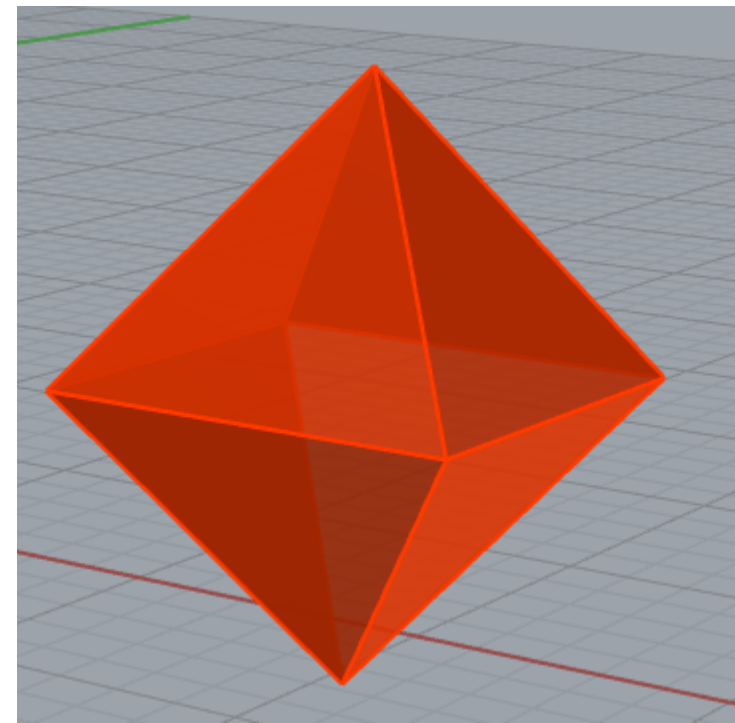
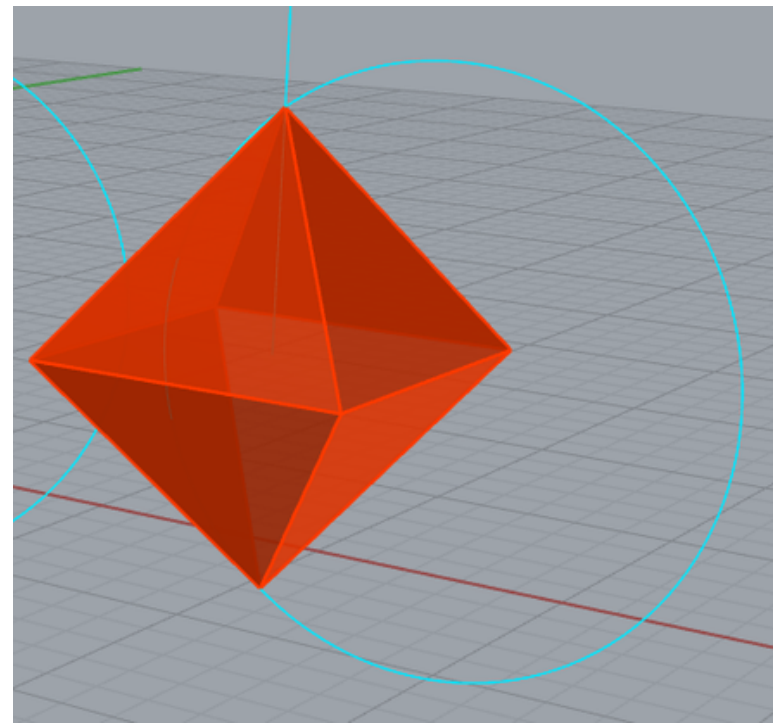
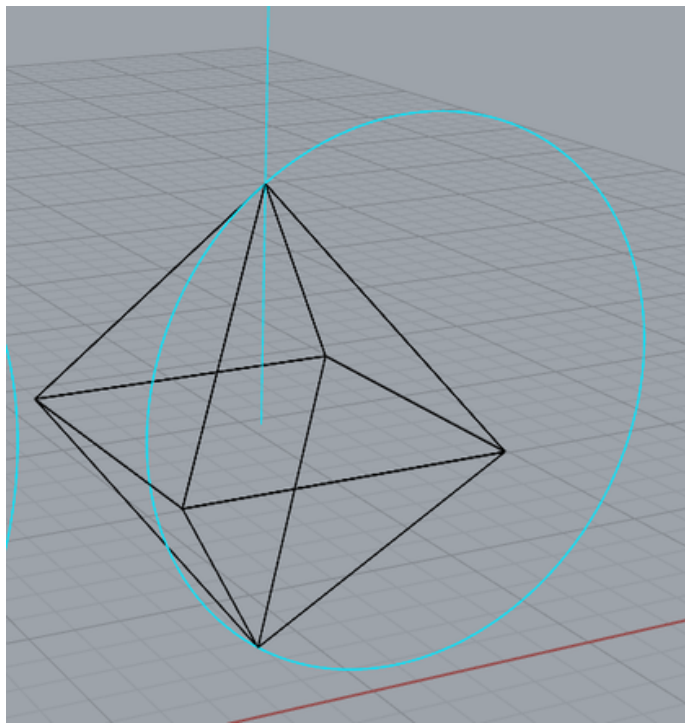
Trabalho 1 Desenvolvimento – RHINO

Triângulo e Triângulo Troncado



Trabalho 1 Desenvolvimento – RHINO

Octaedro e Octaedro Troncado

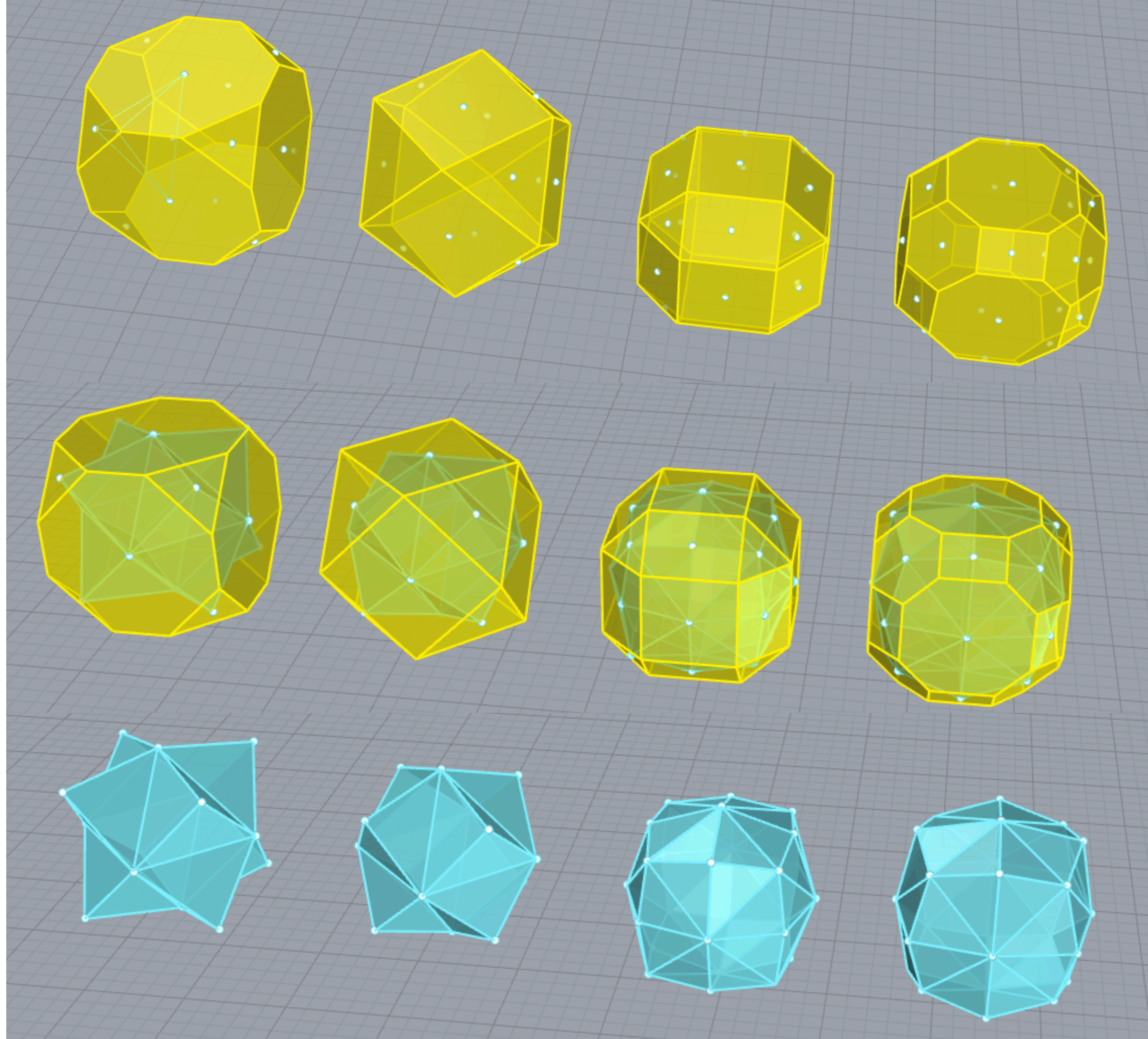


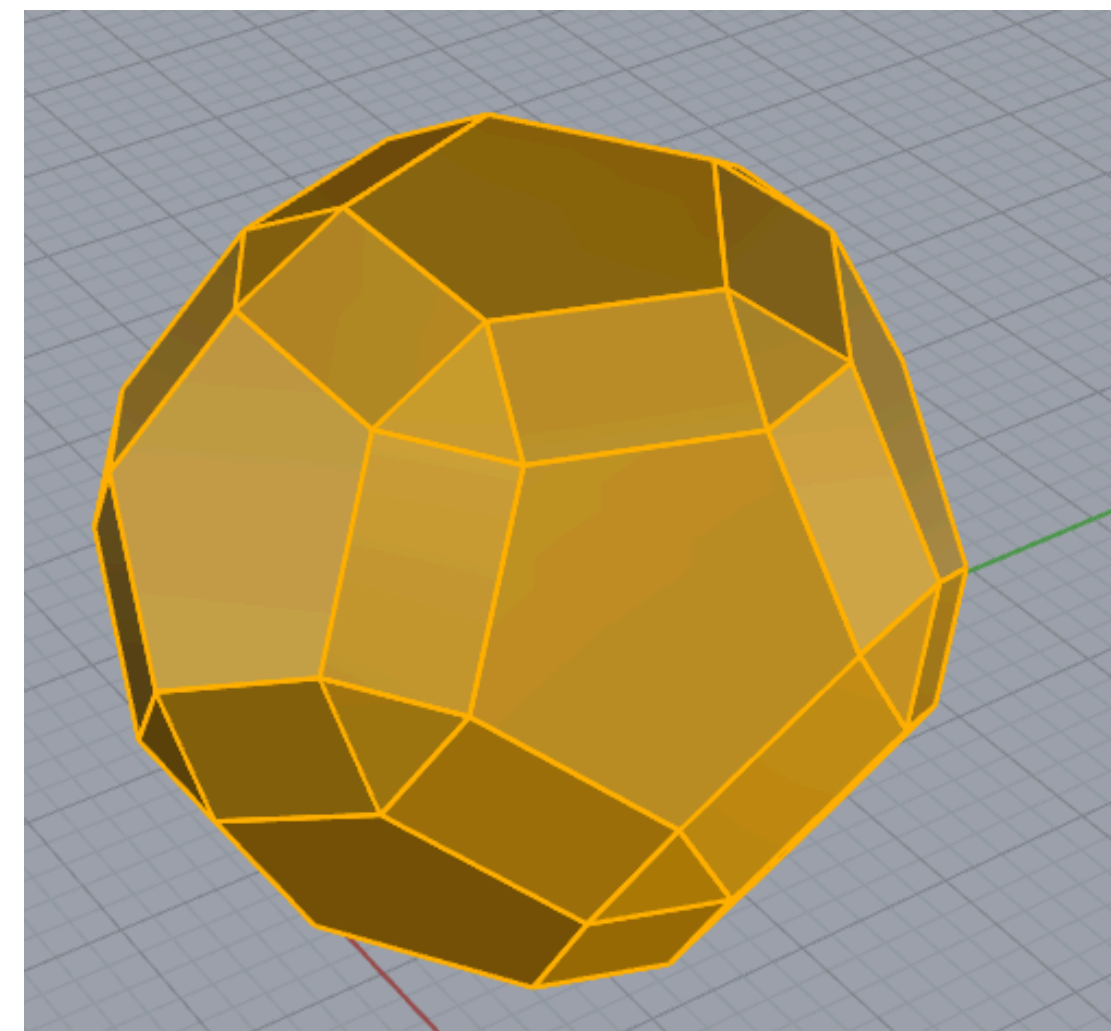
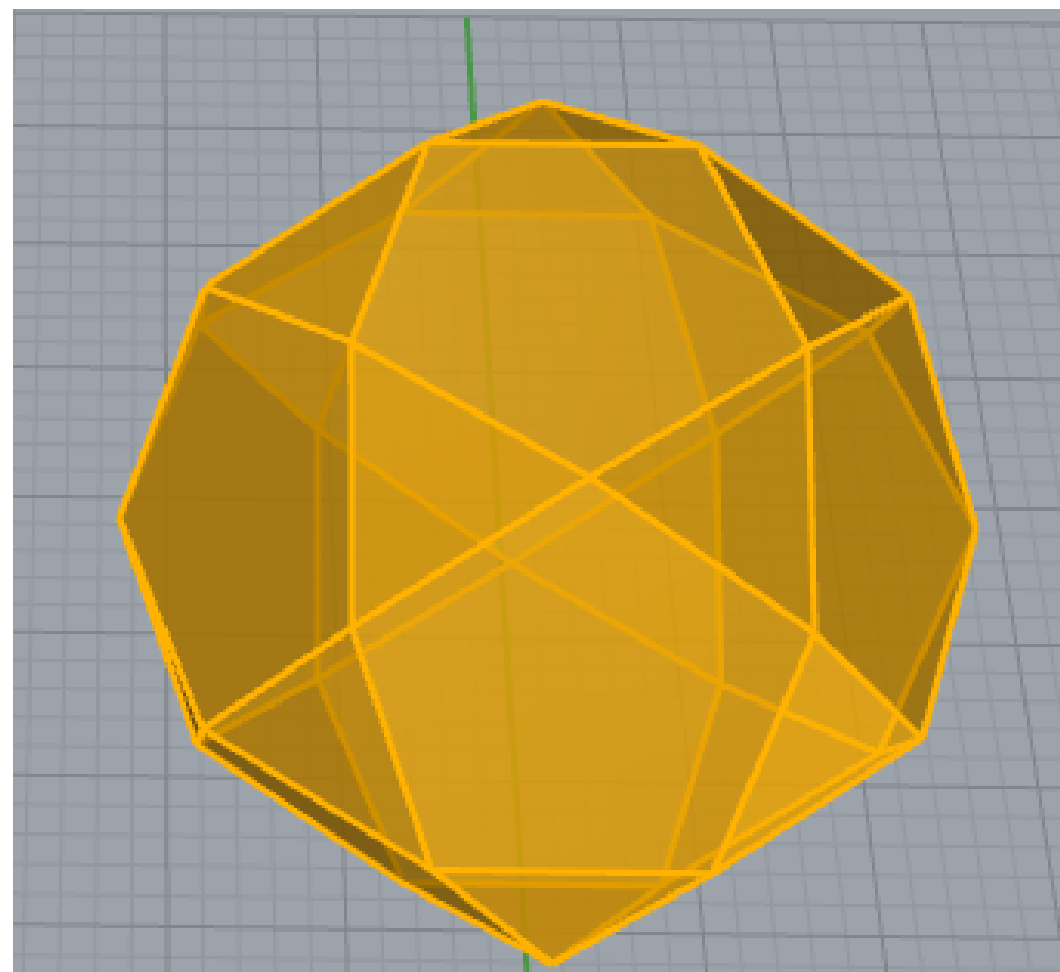
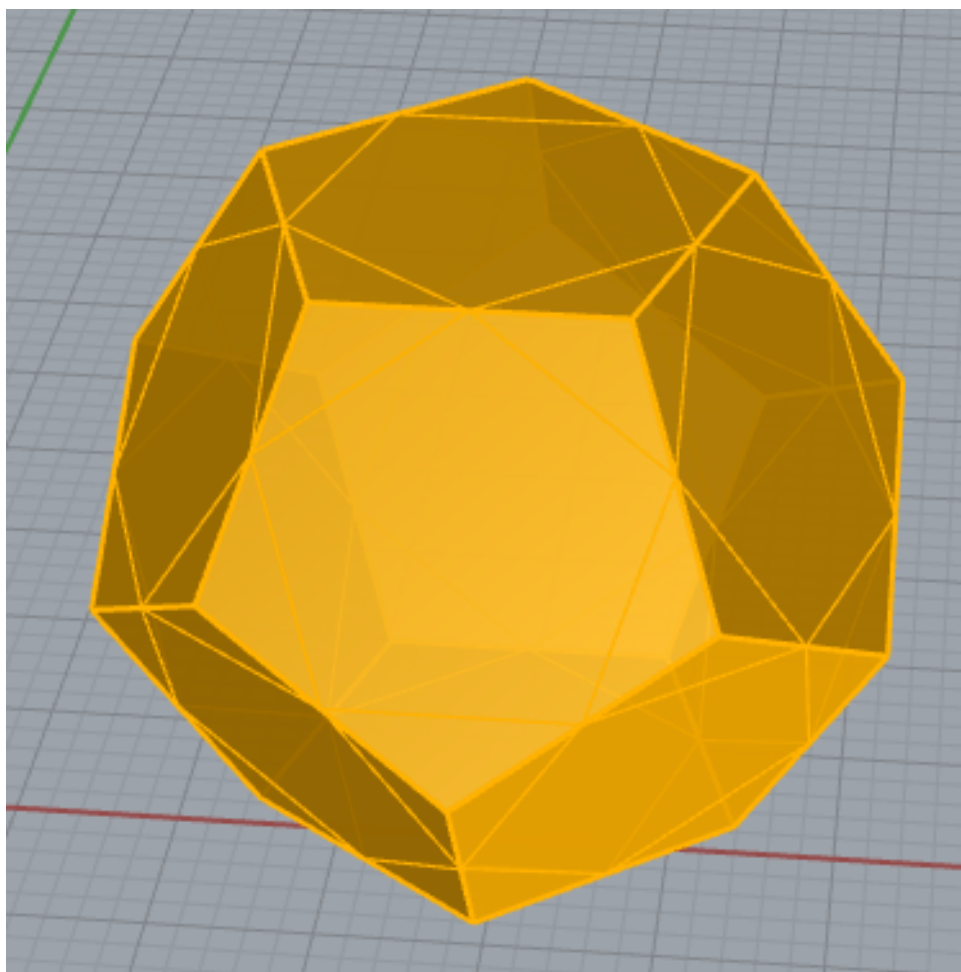
Trabalho 1 Desenvolvimento – RHINO

Duais

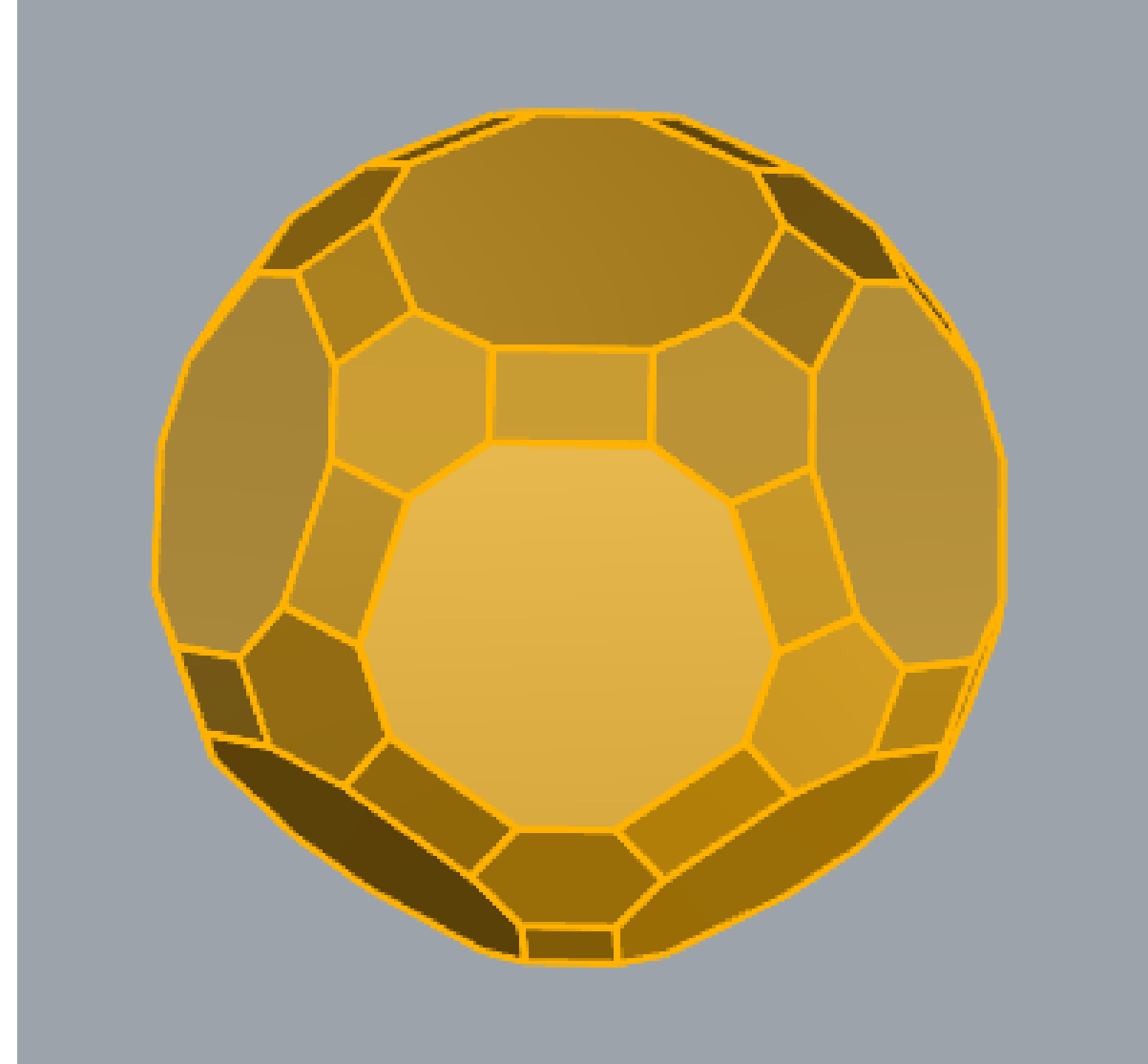
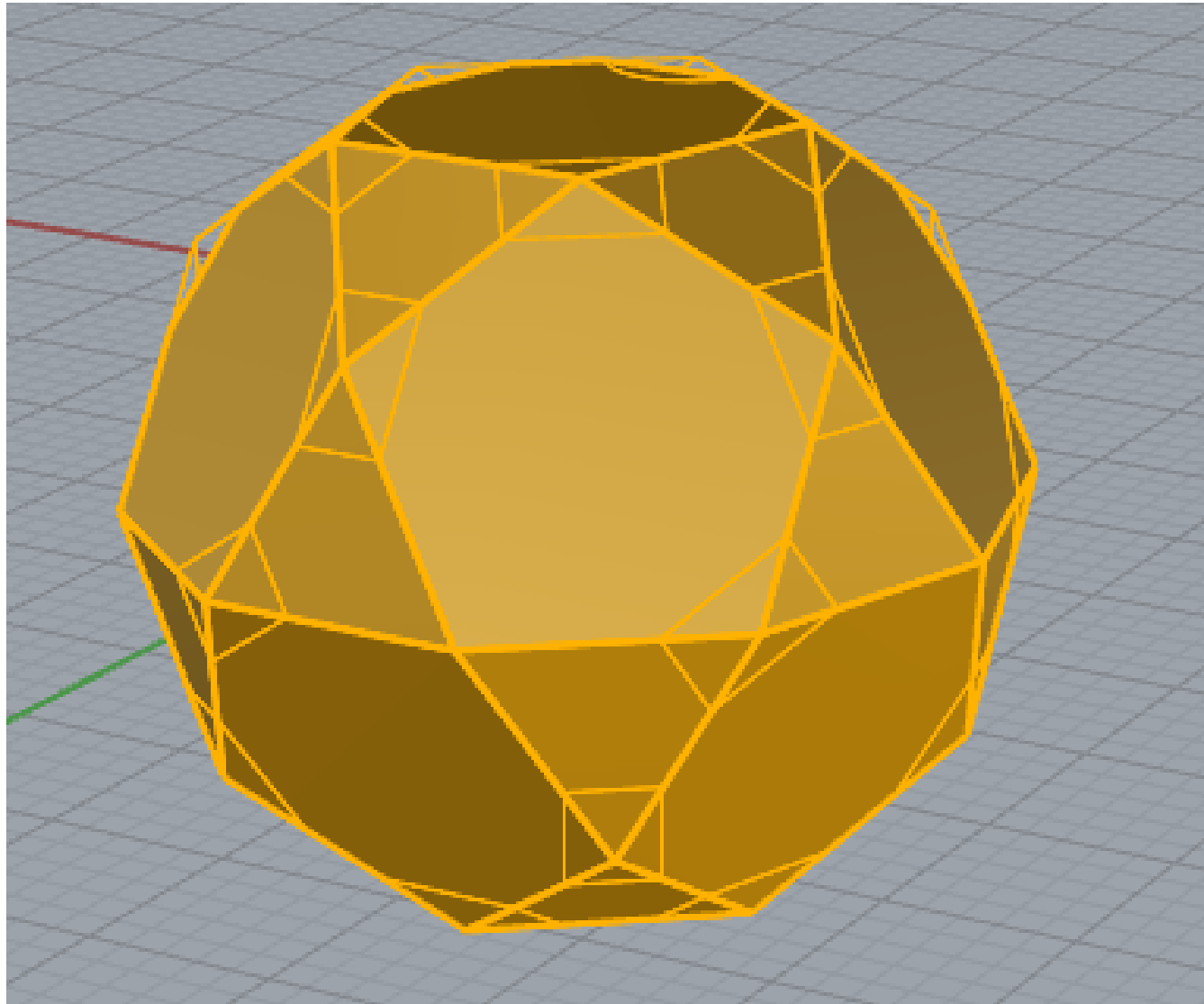
Trabalho 1

Desenvolvimento – RHINO

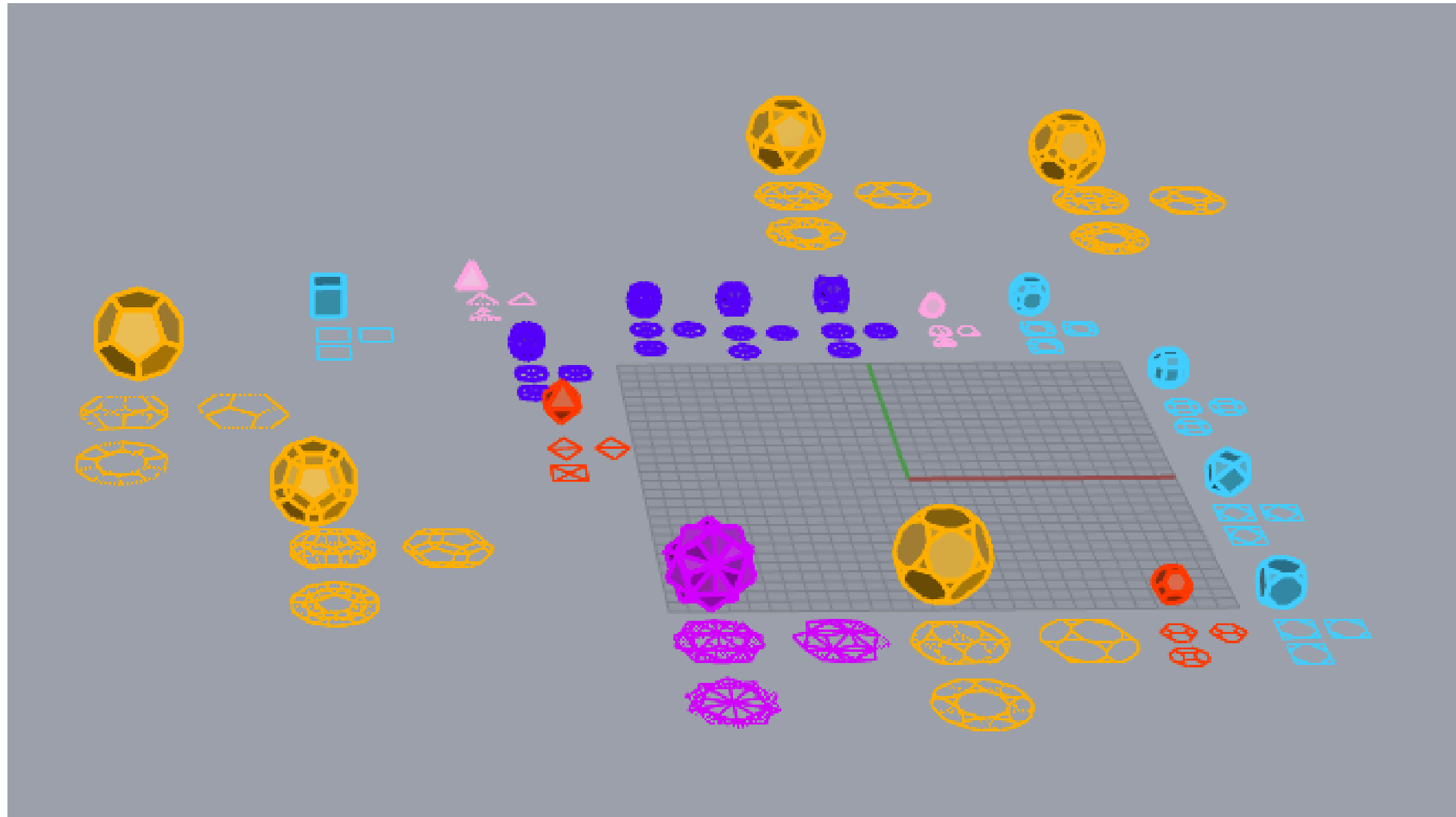




Trabalho 1 Desenvolvimento – RHINO



Trabalho 1 Desenvolvimento – RHINO



Trabalho 1 Desenvolvimento – RHINO

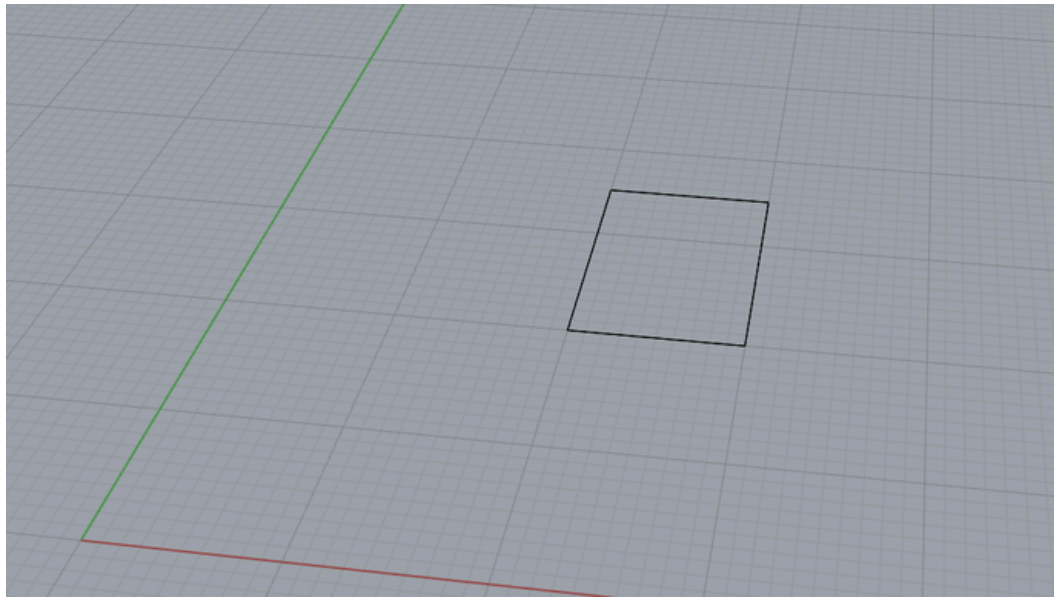
Sumário

1- Abrir ficheio Rhino- Large Objects Meters

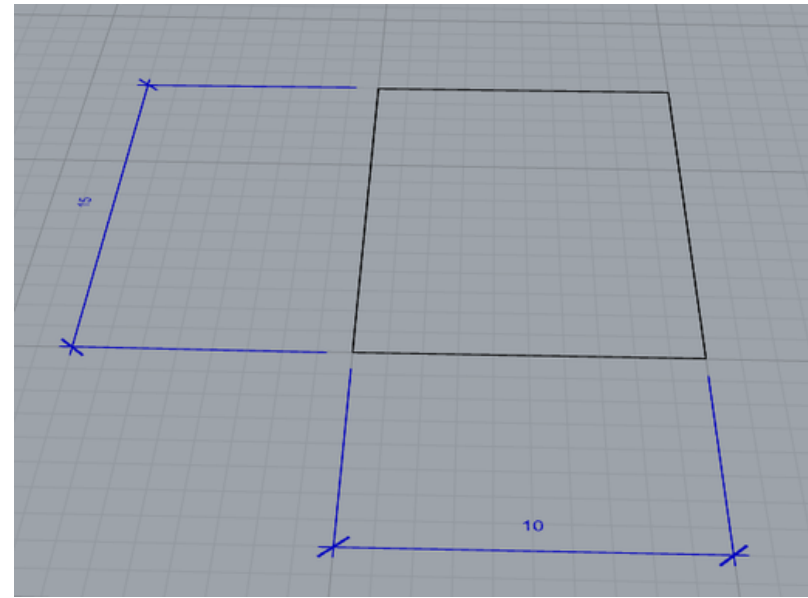
2-Modelar Vaults (Abóbadas)

- De berço
- De Cisterna
- De Ogiva
- De Abatida

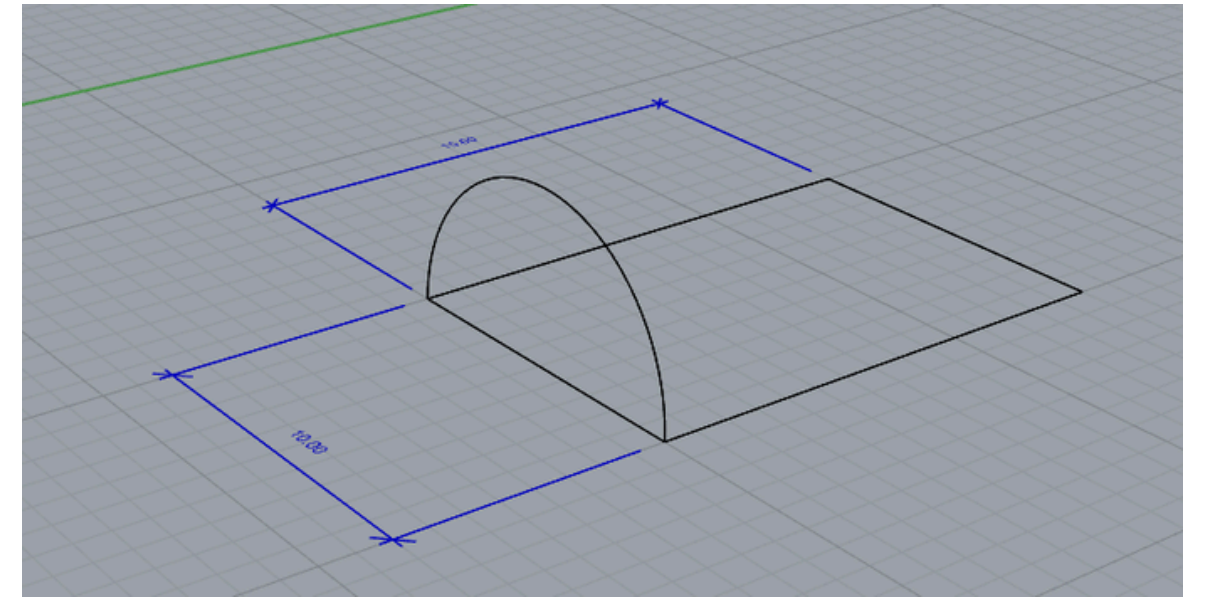
1- Fazer Retângulo com 15/10 cm



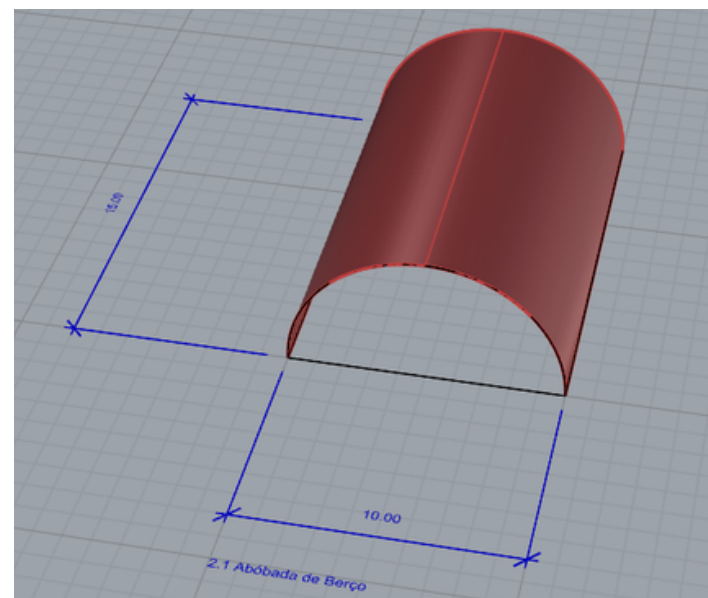
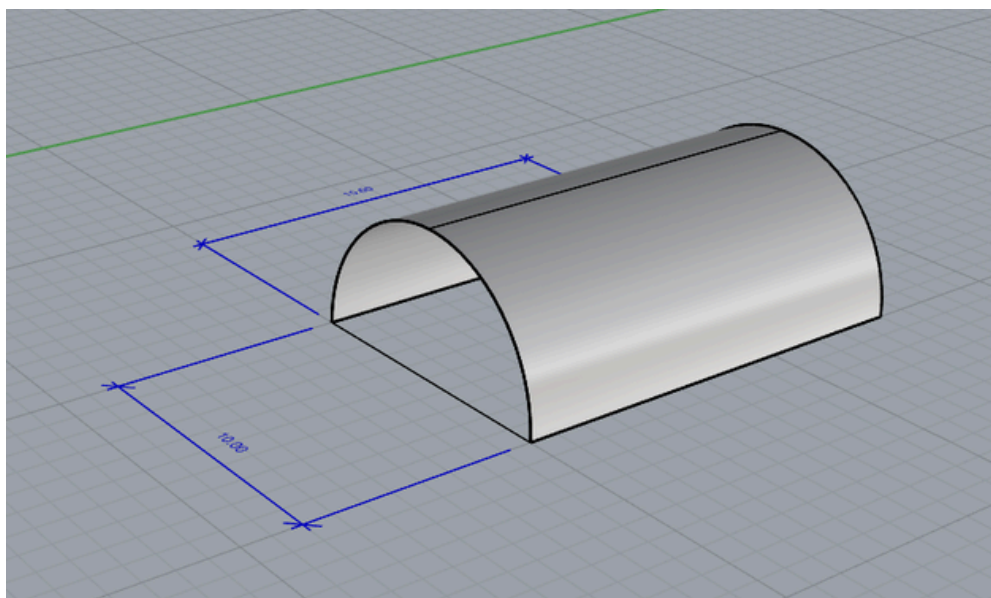
2- Colocar Dimensões



3- Fazer arco



4- Usar comando ExtrudeCRV



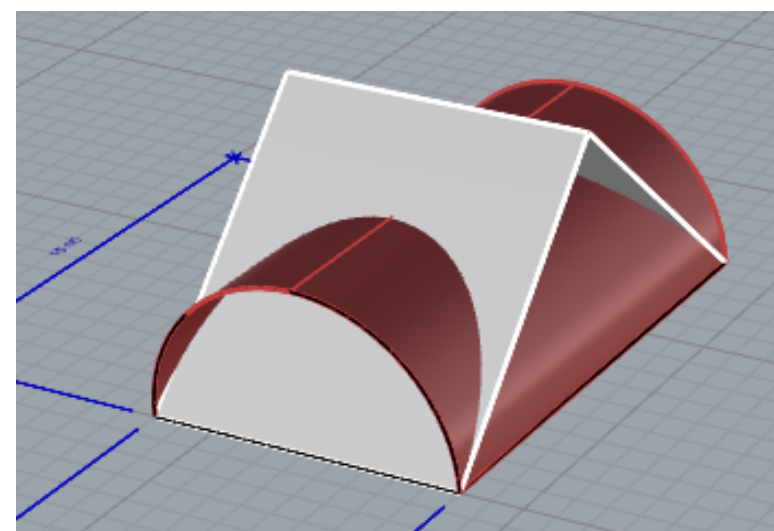
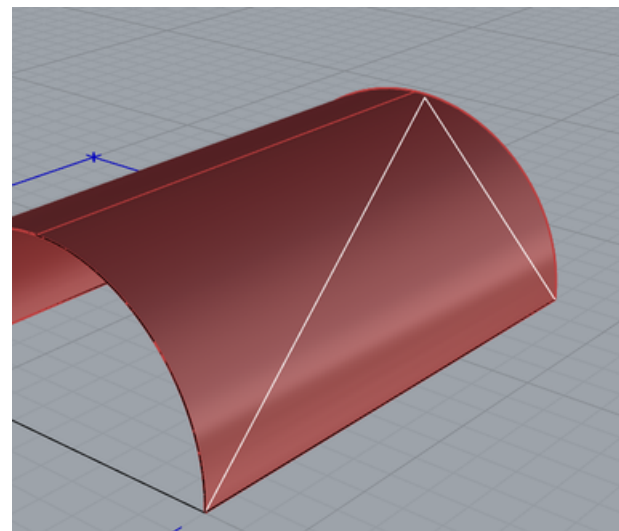
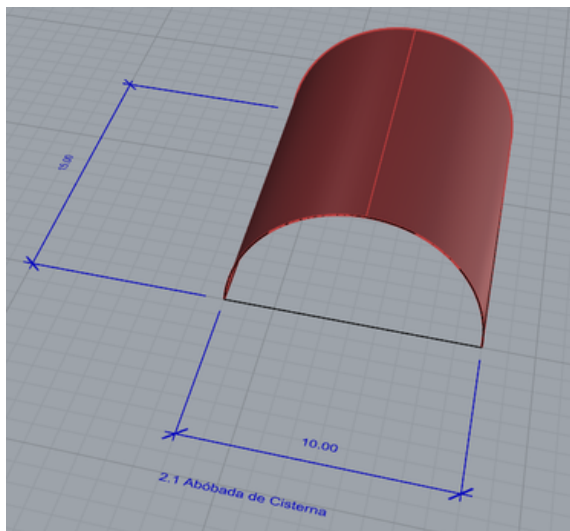
Abóbada de Berço- Aula 5

Relative Polar Coordinate

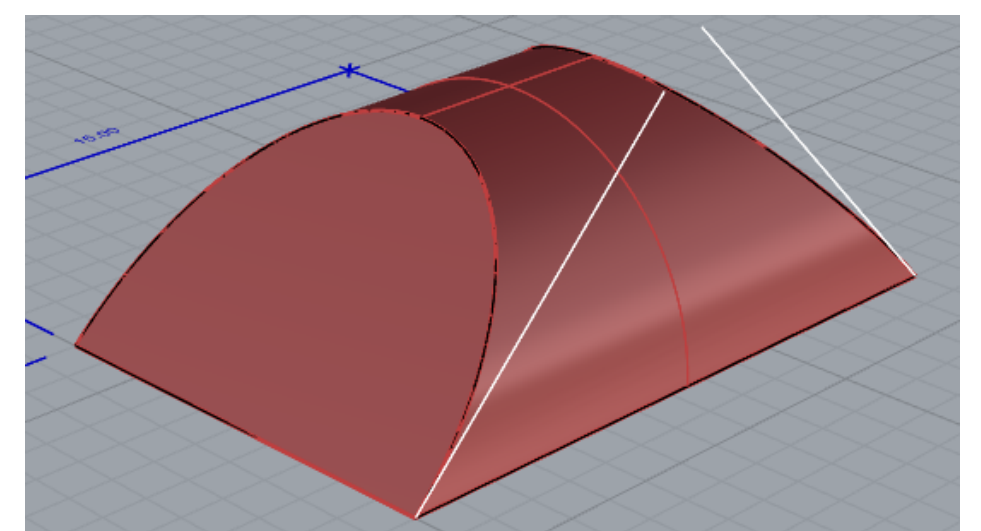
@ - Distância;

< - ângulo

Copiar base do anterior

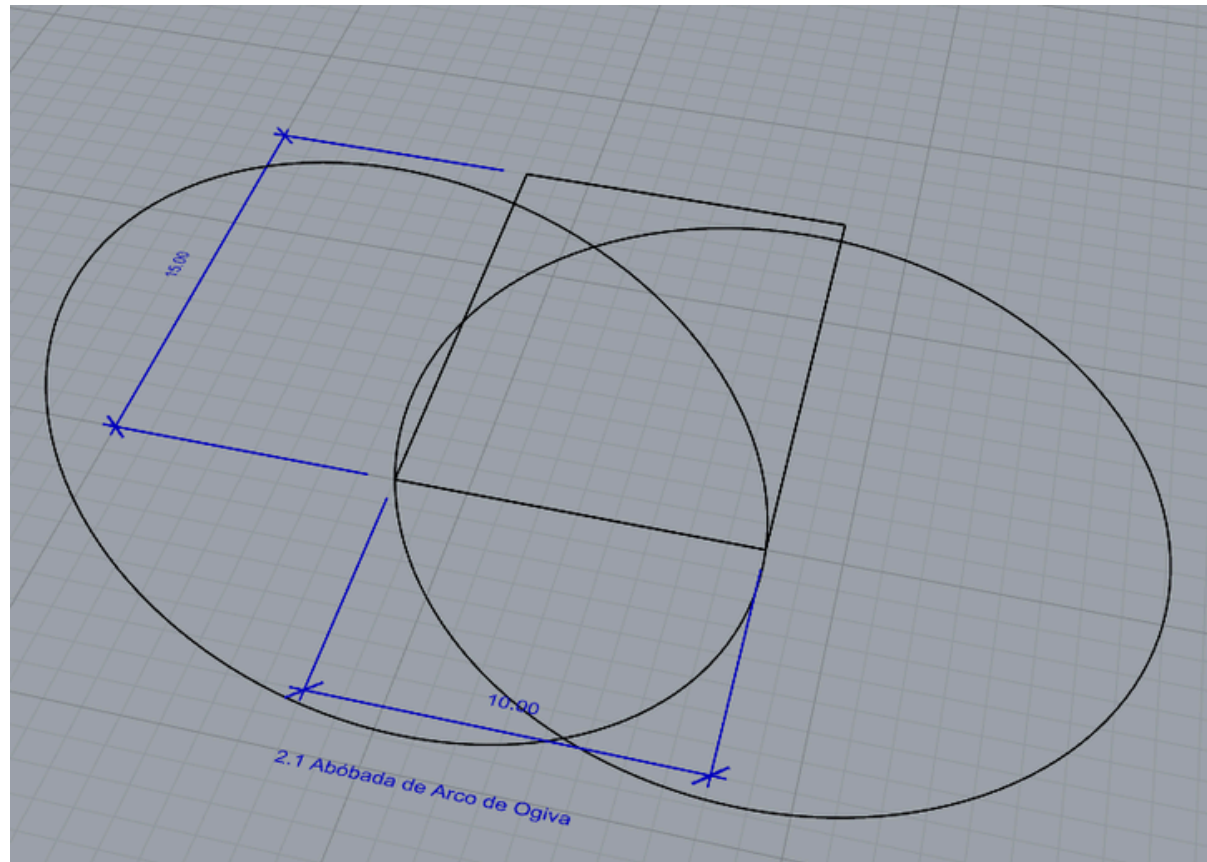


Trim

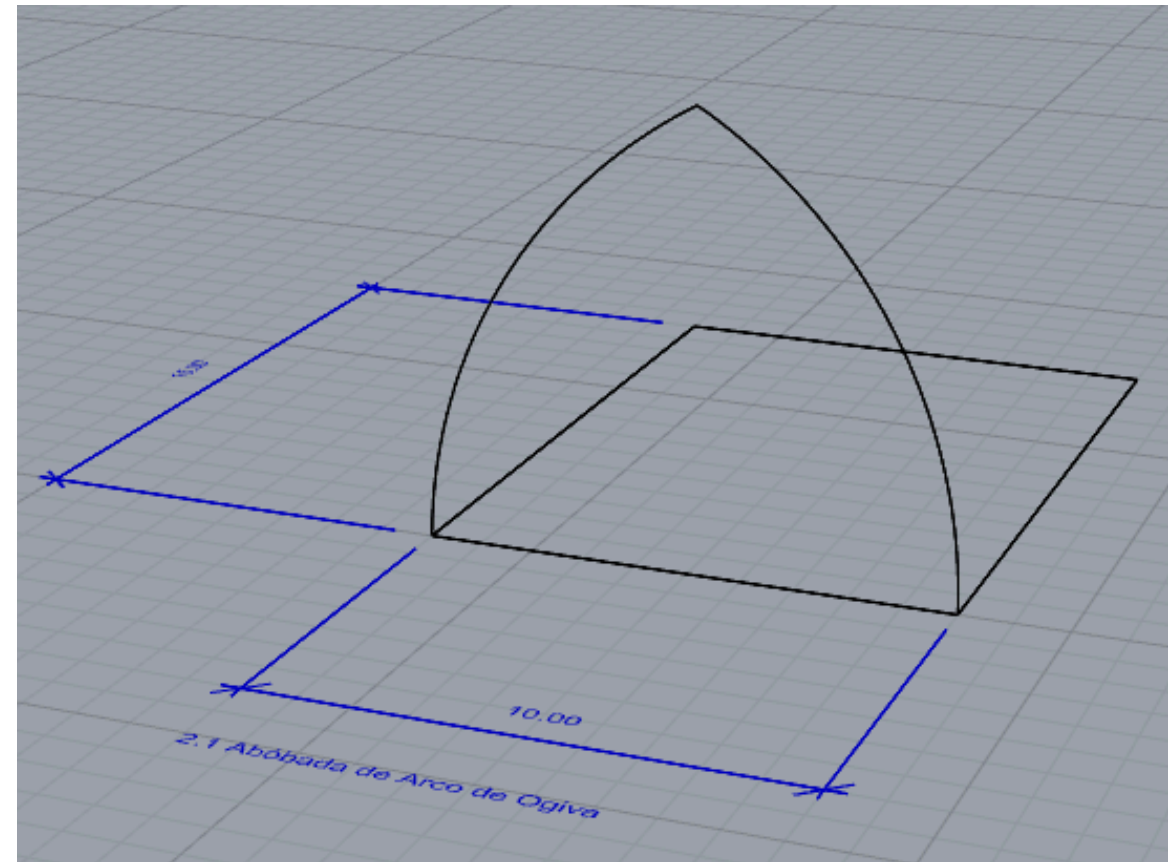


Abóbada de Cisterna- Aula 5

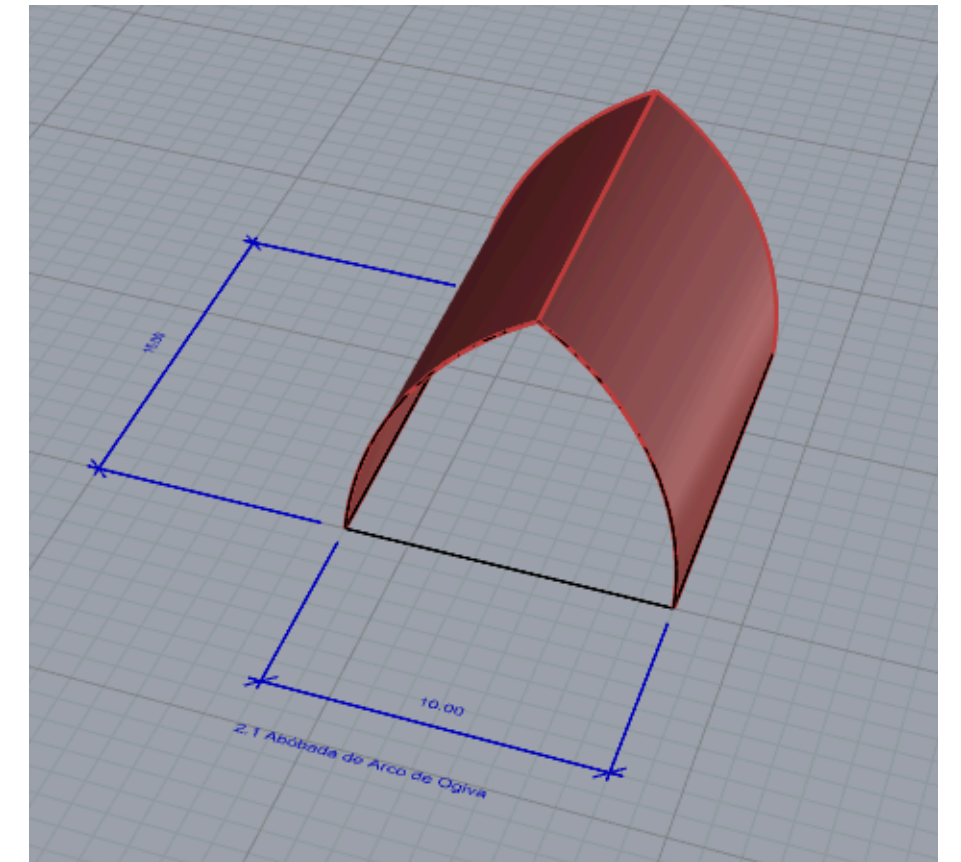
Copiar base do anterior



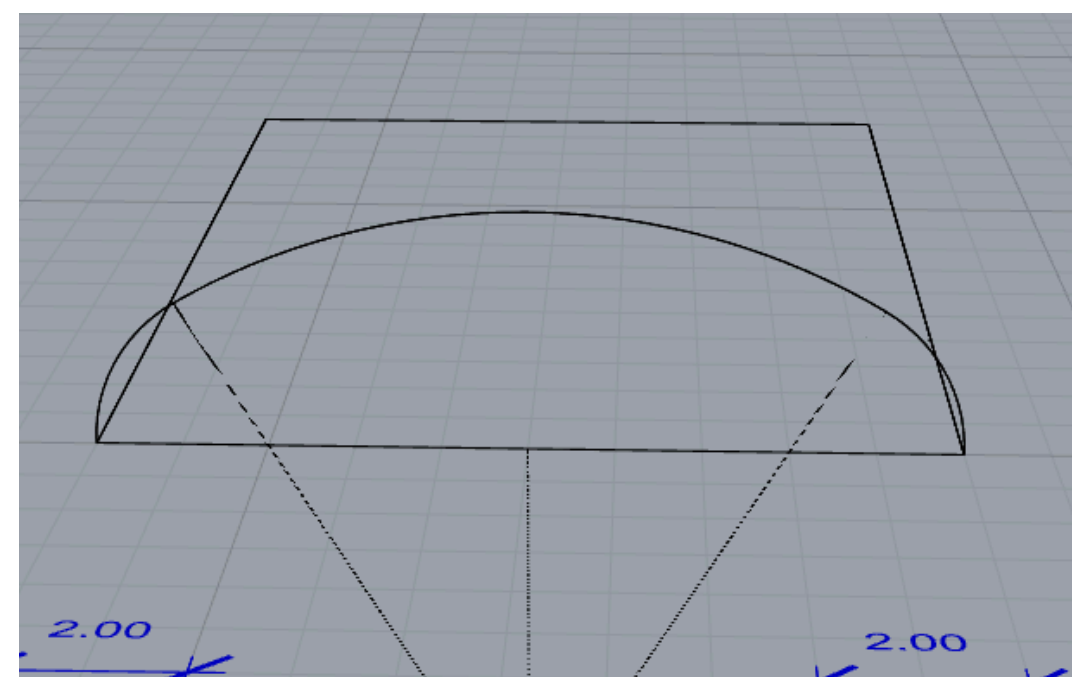
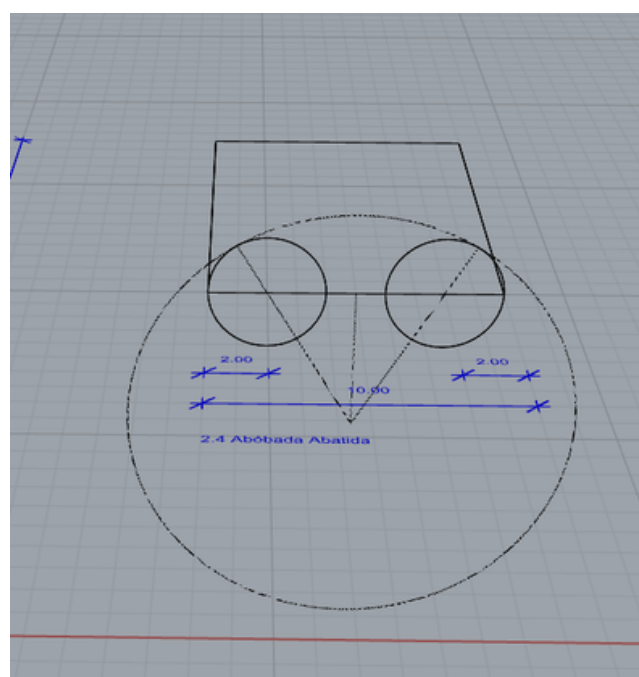
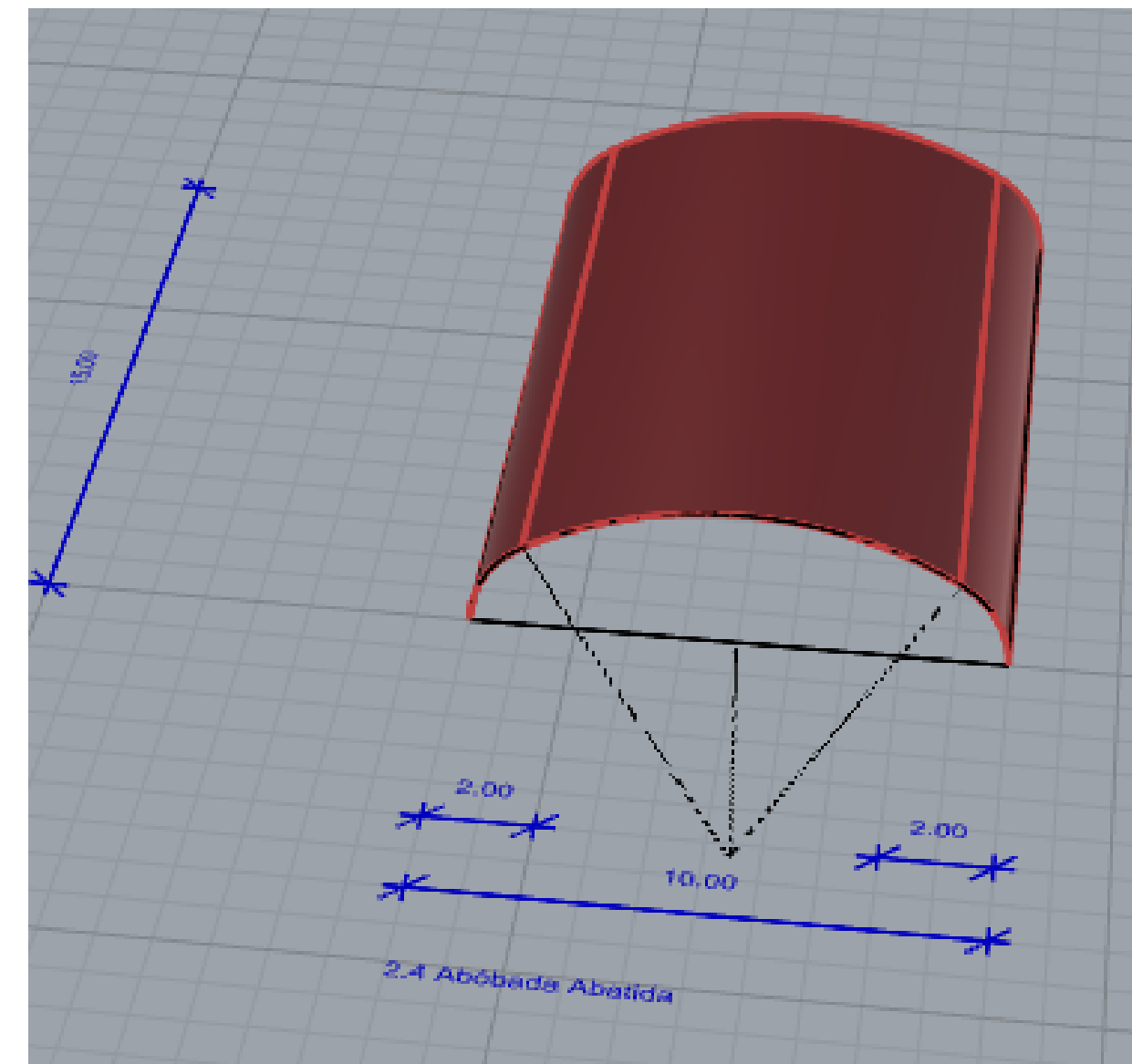
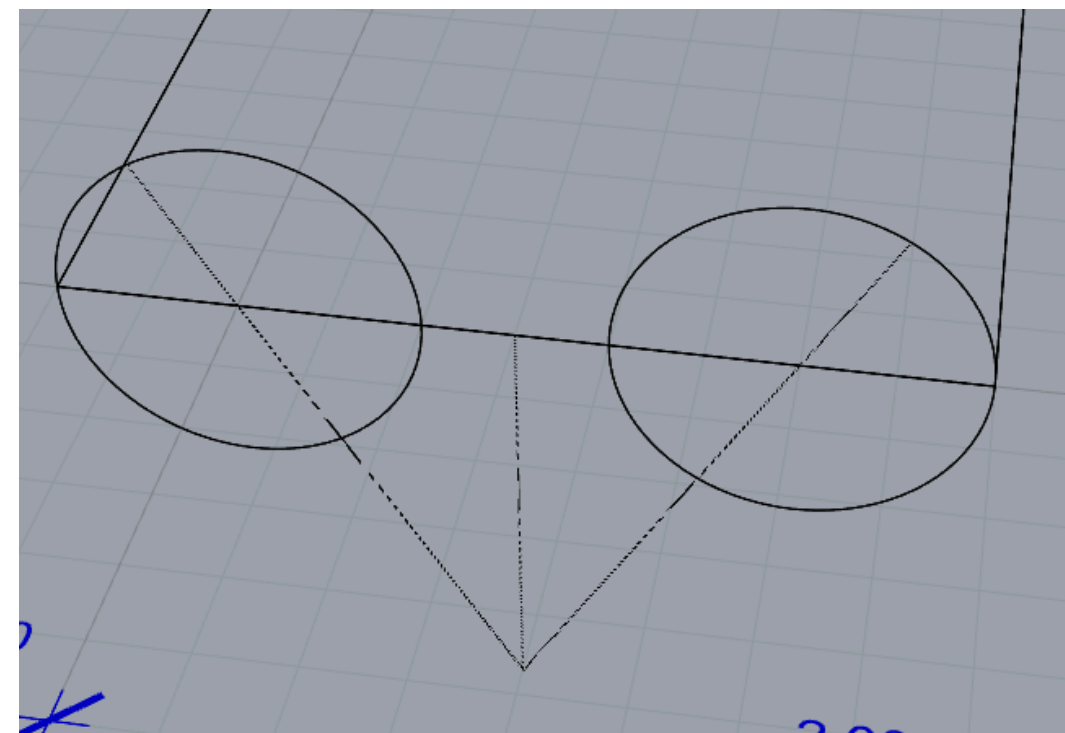
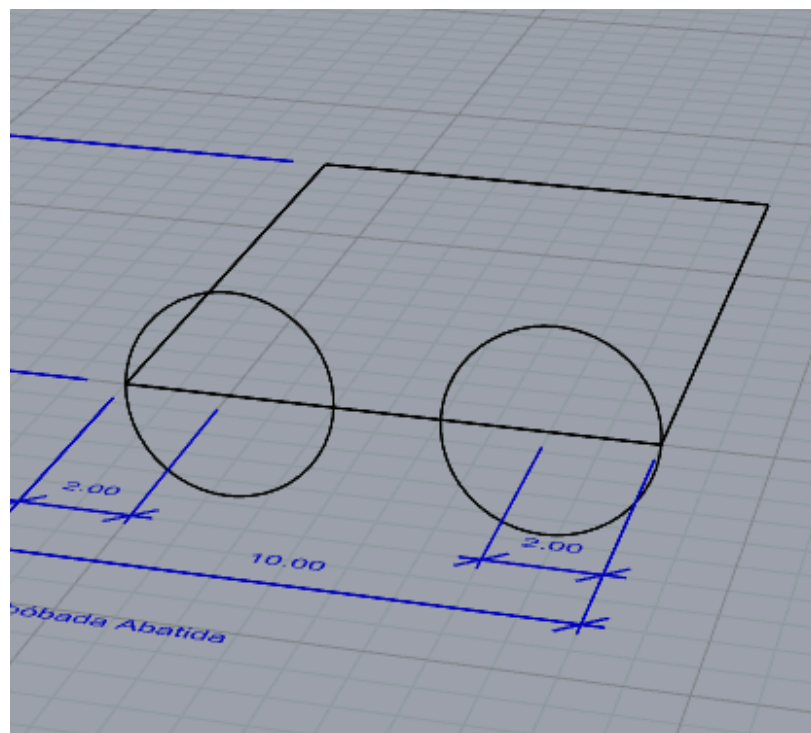
Trim e Join



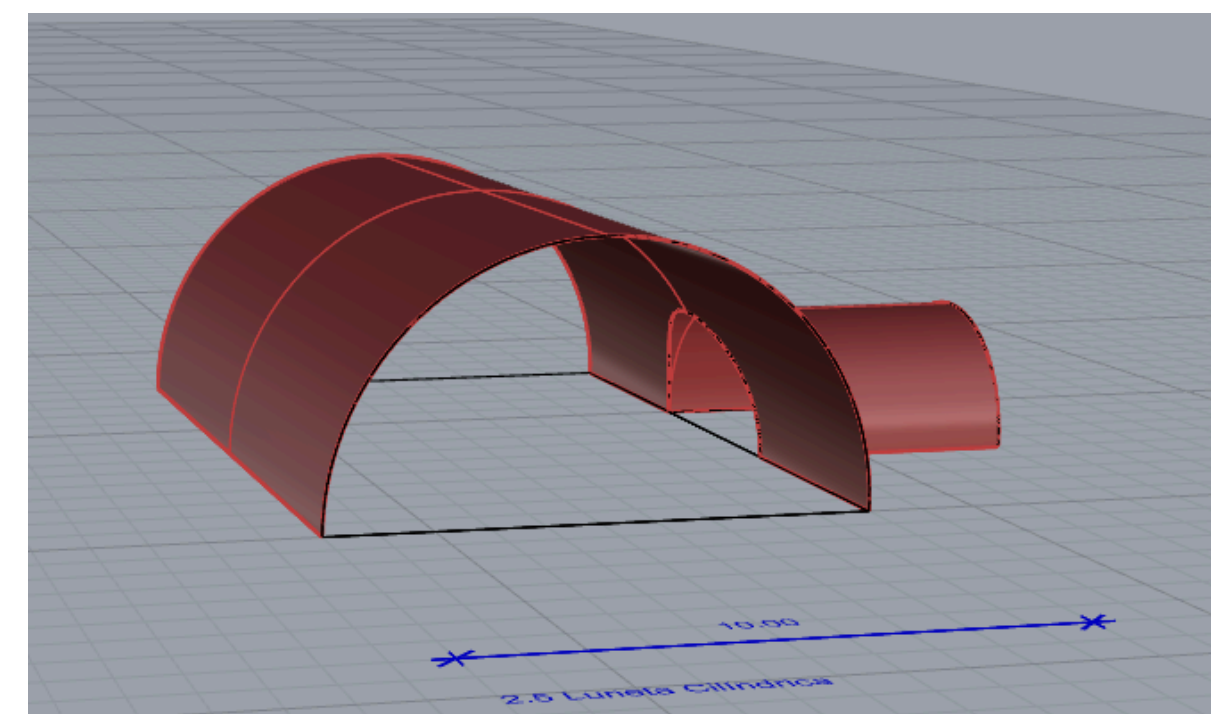
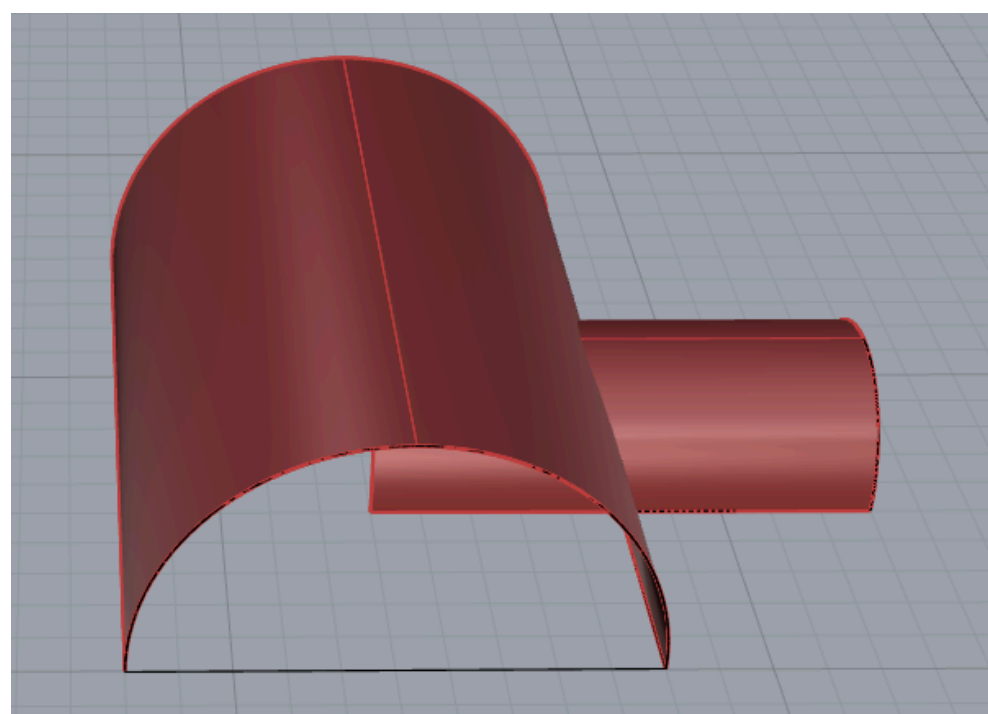
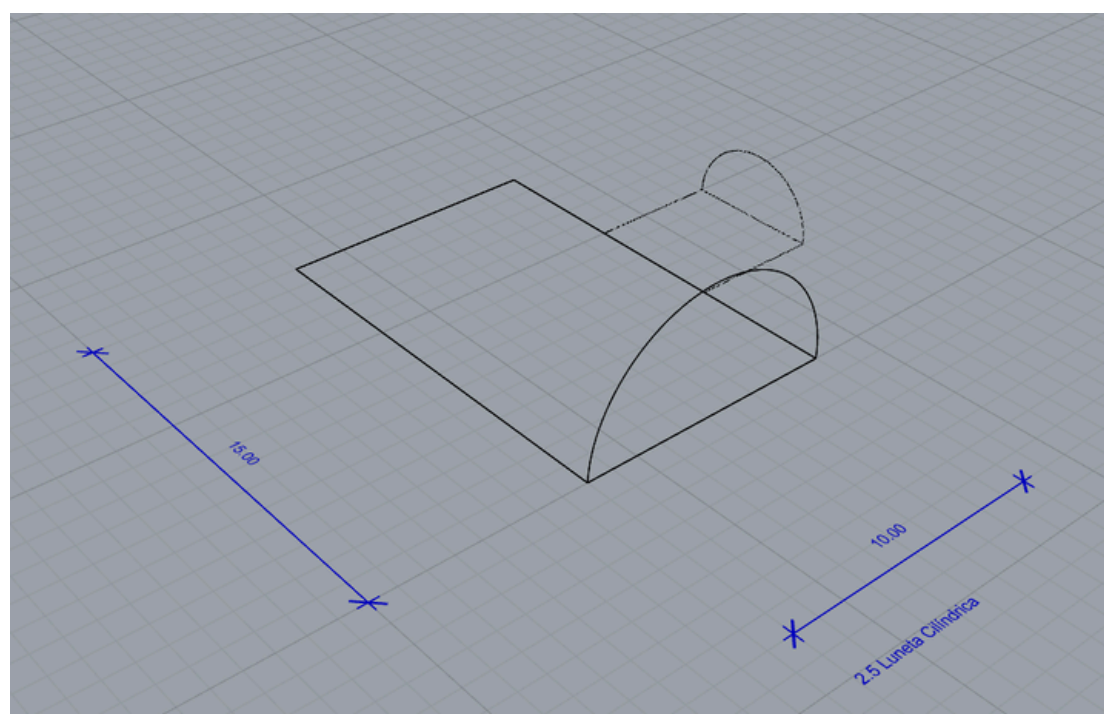
Extrude



Abóbada de Ogiva- Aula 5



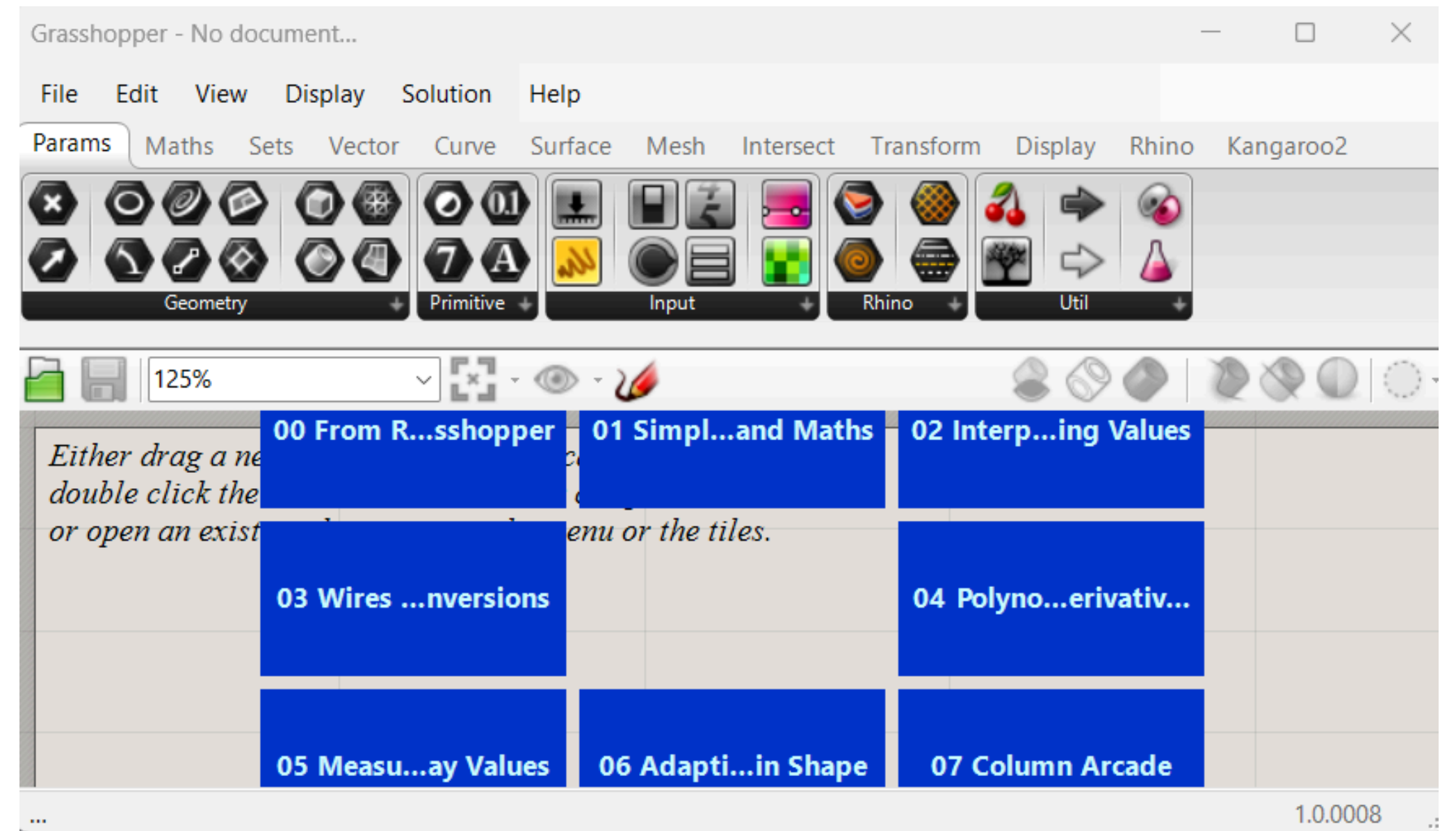
Abóbada Abatida- Aula 5

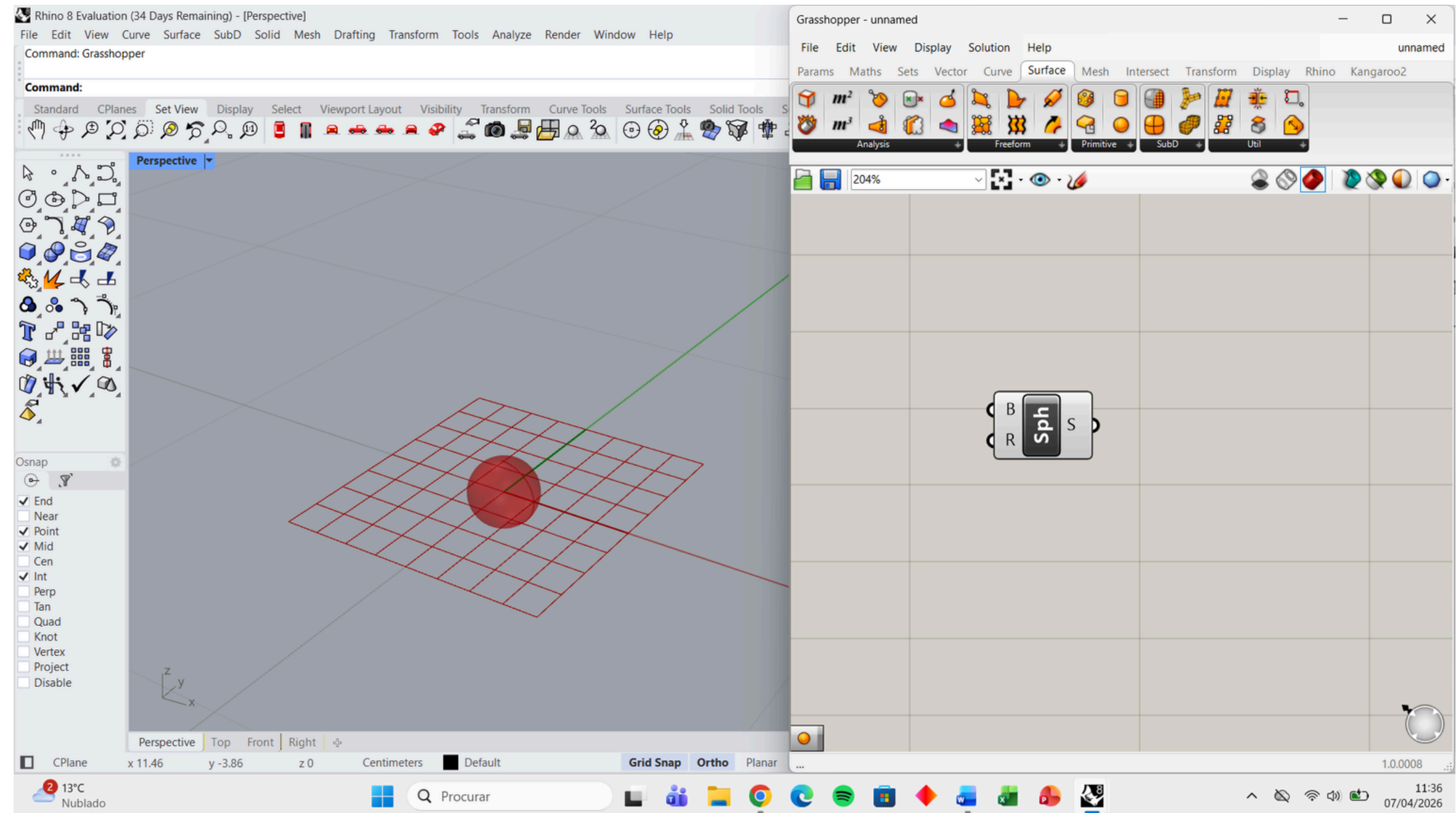
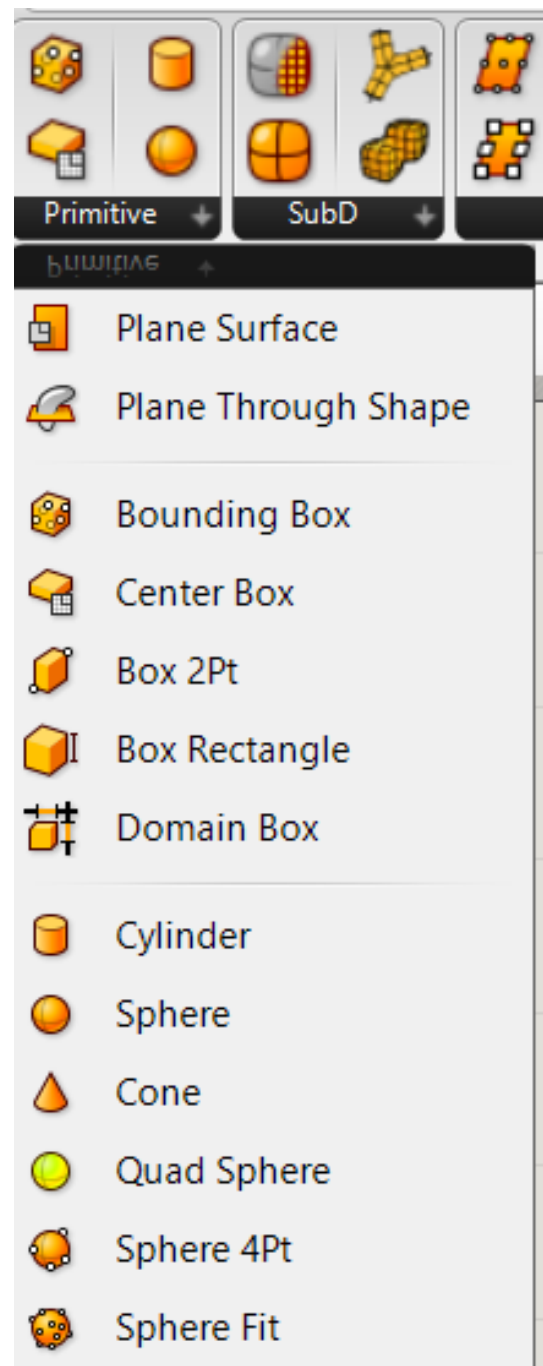


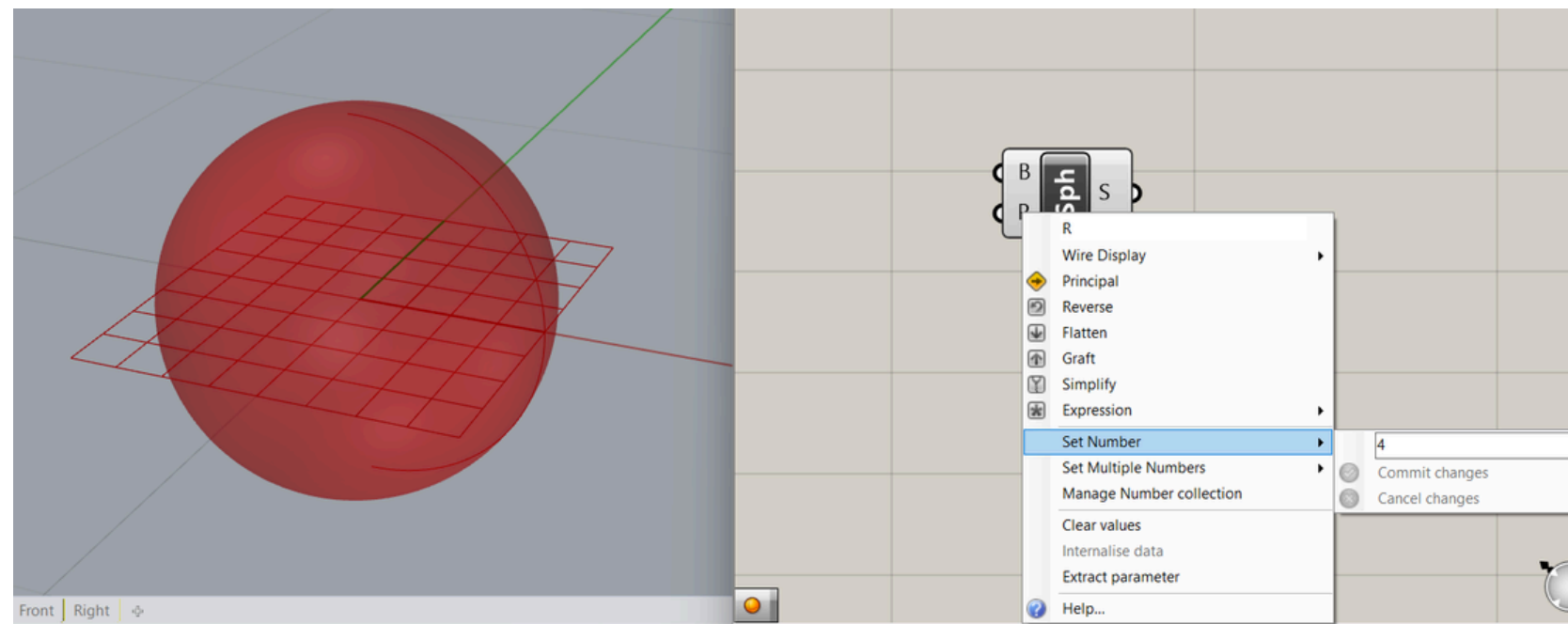
Luneta Cilindrica - Aula 5

Novo trabalho Abóbadas

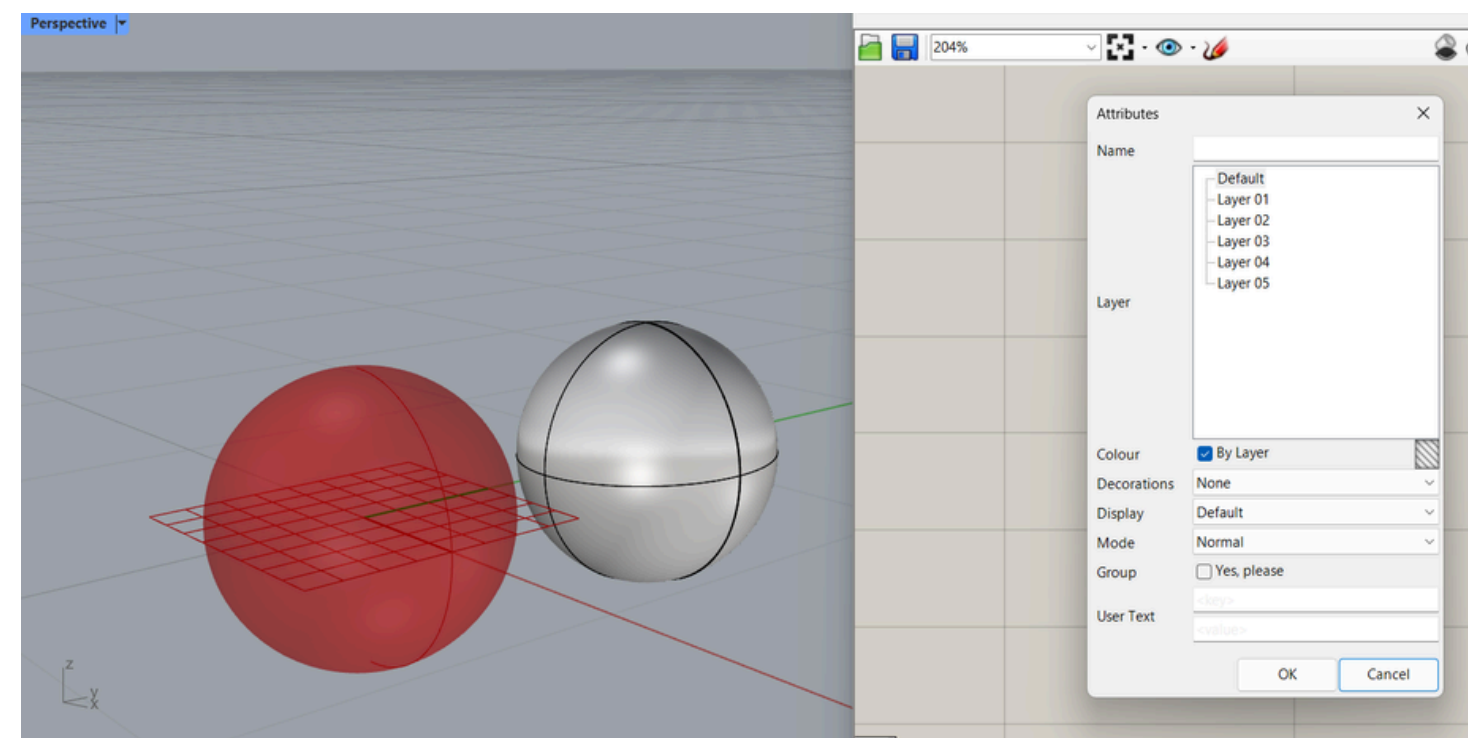
GrassHopper







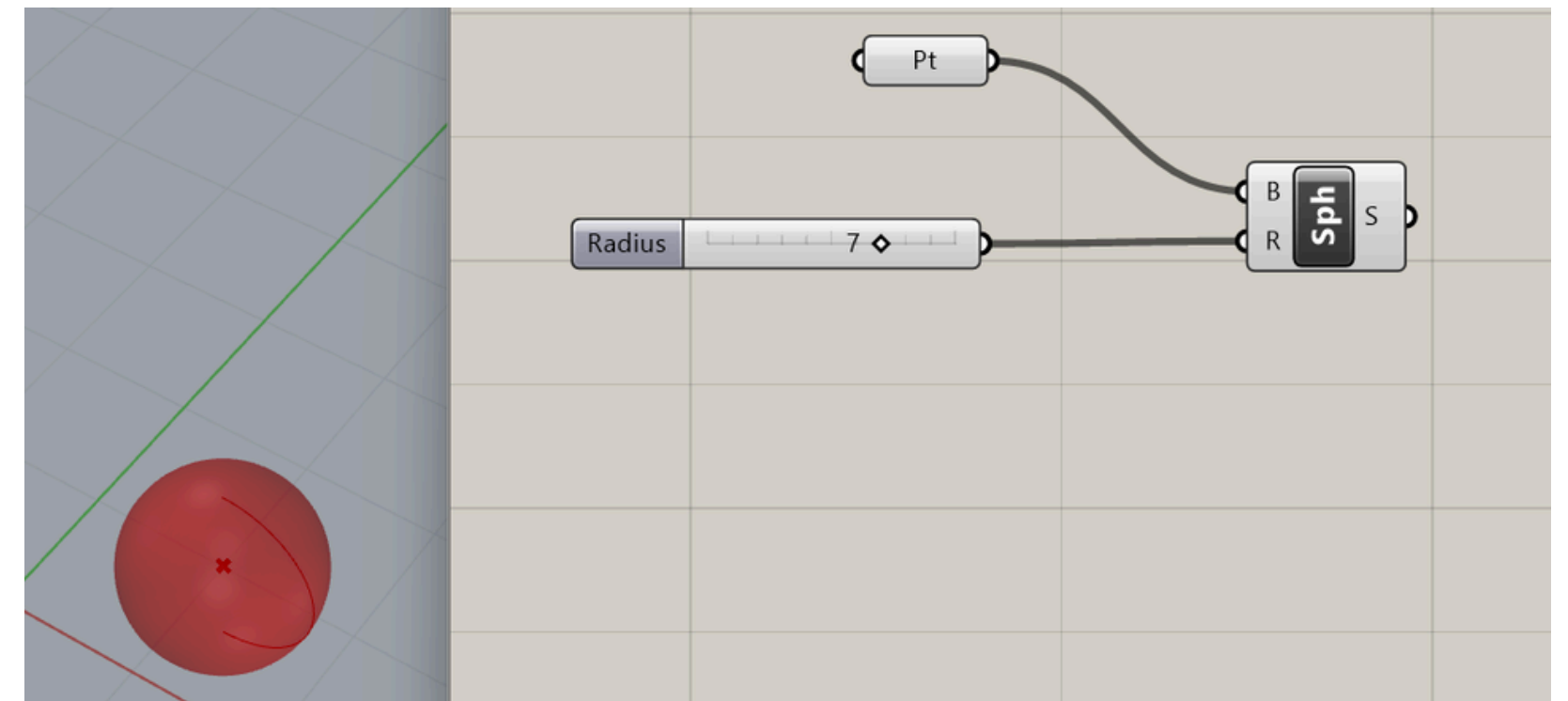
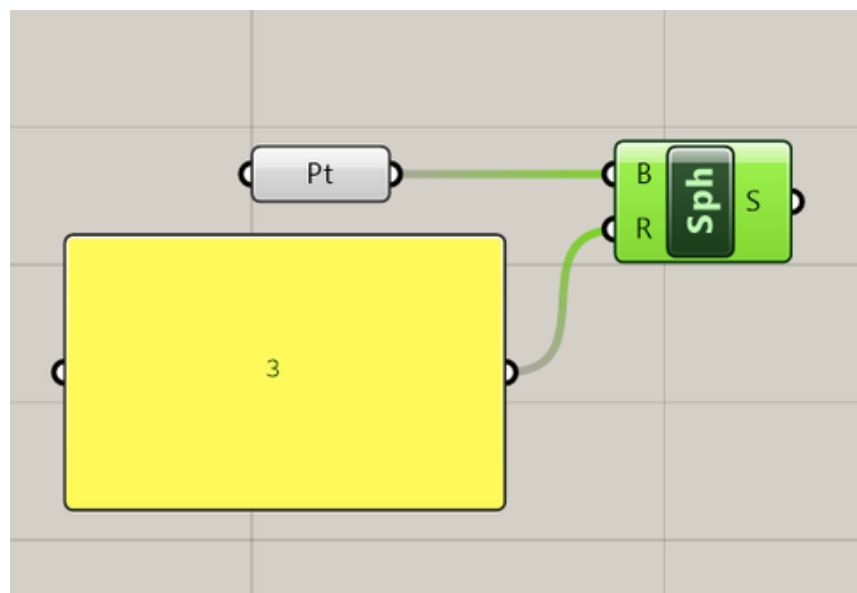
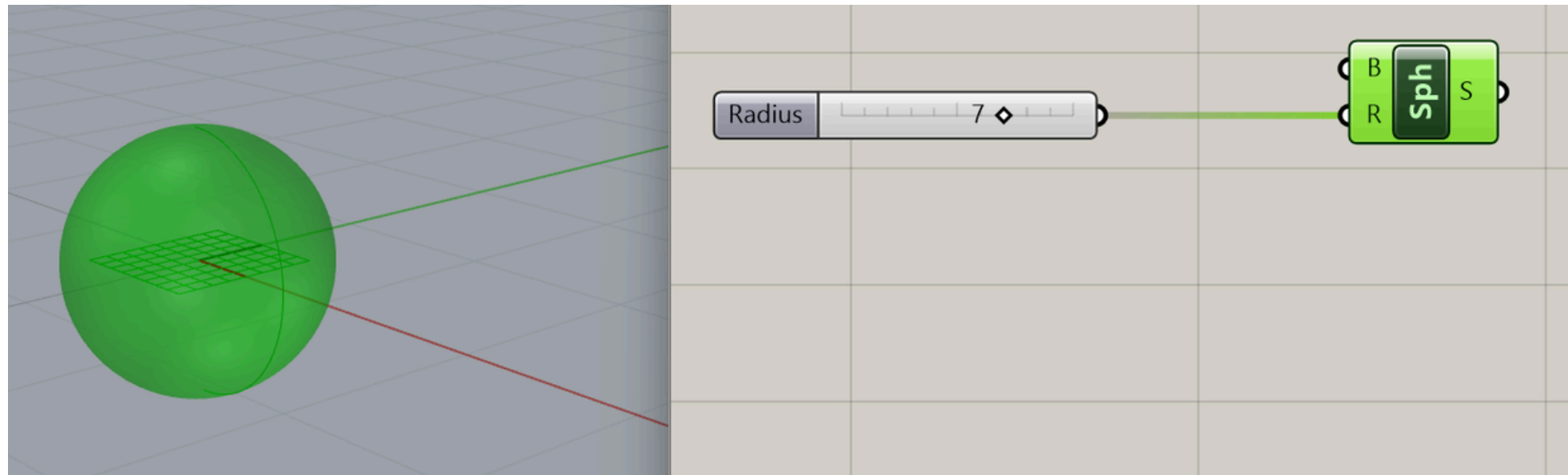
Mudar o raio da esfera



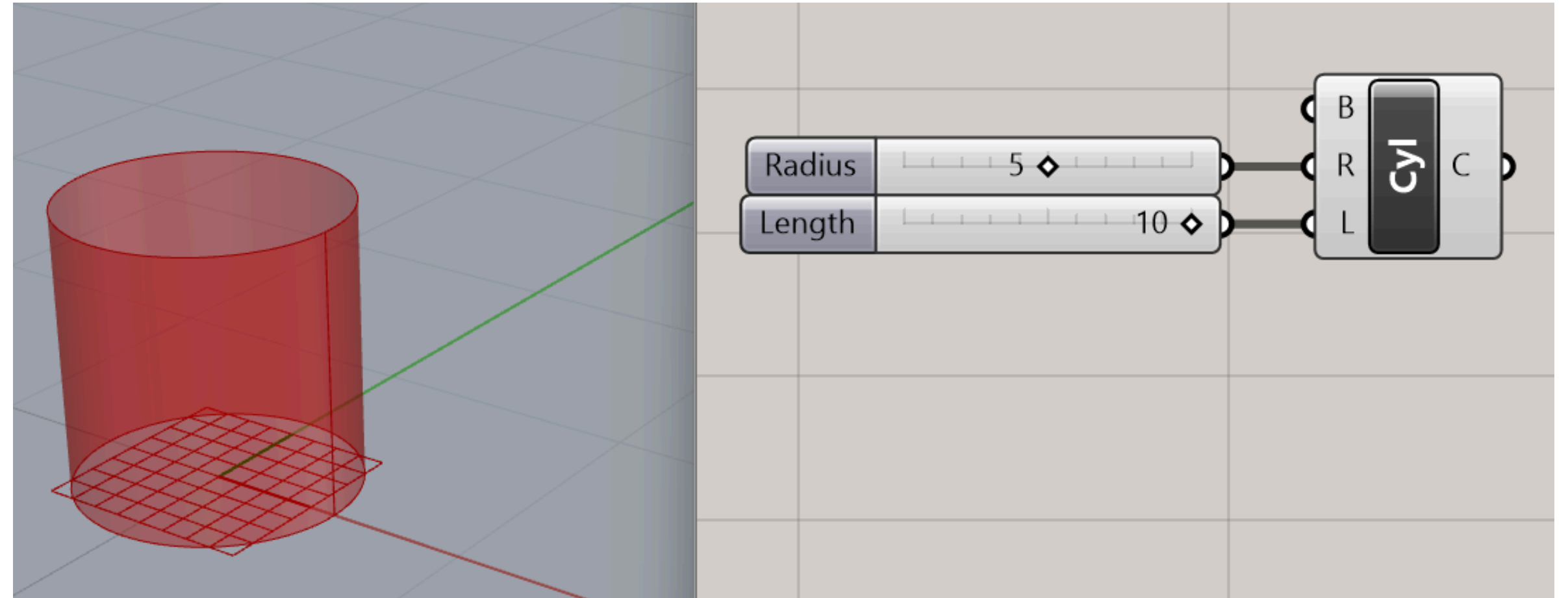
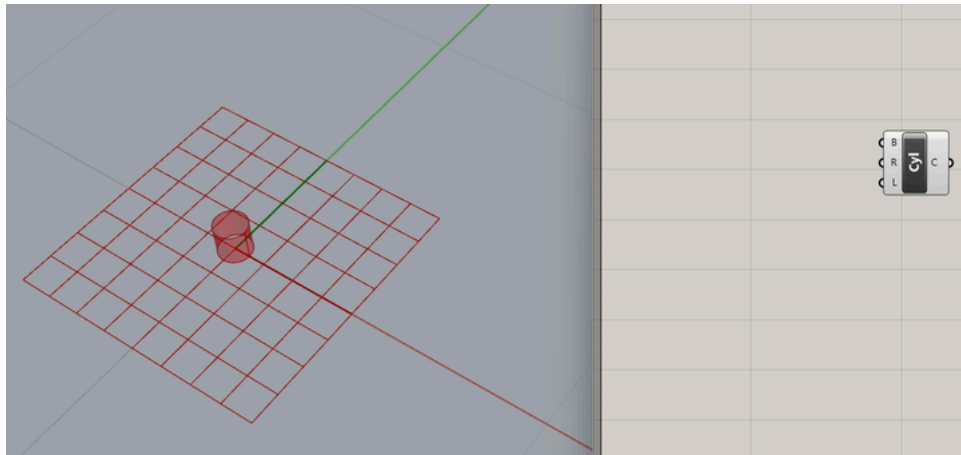
Para colocar dentro do Rhino

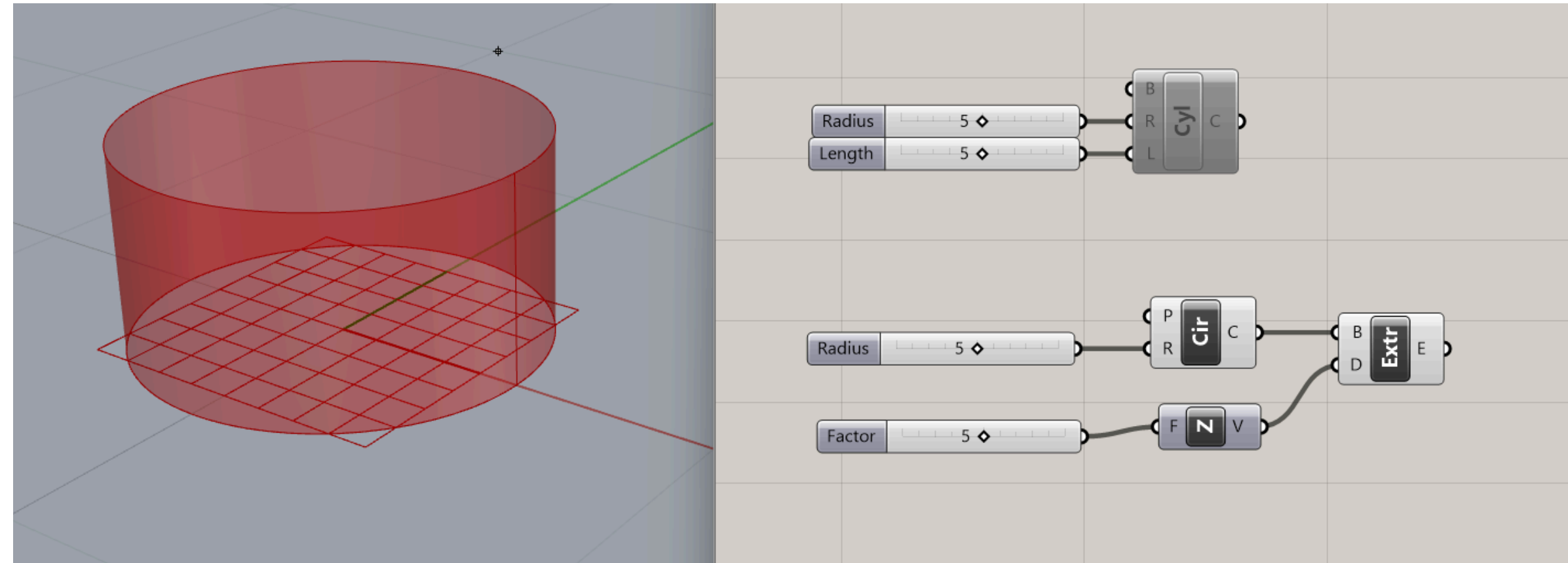
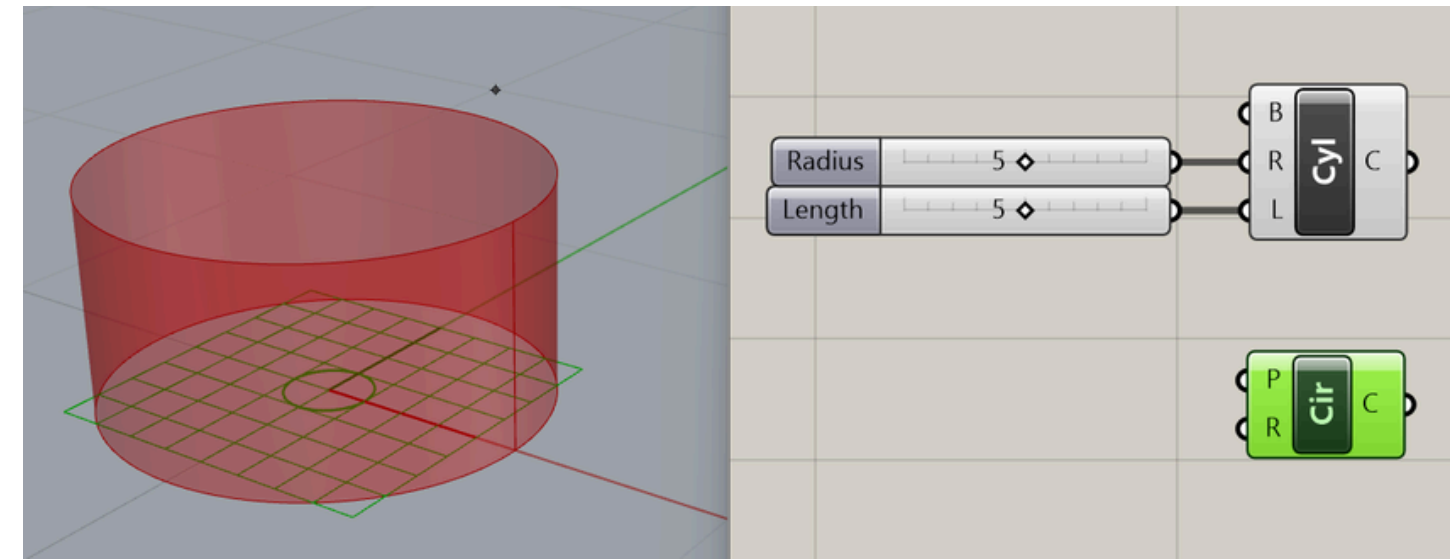
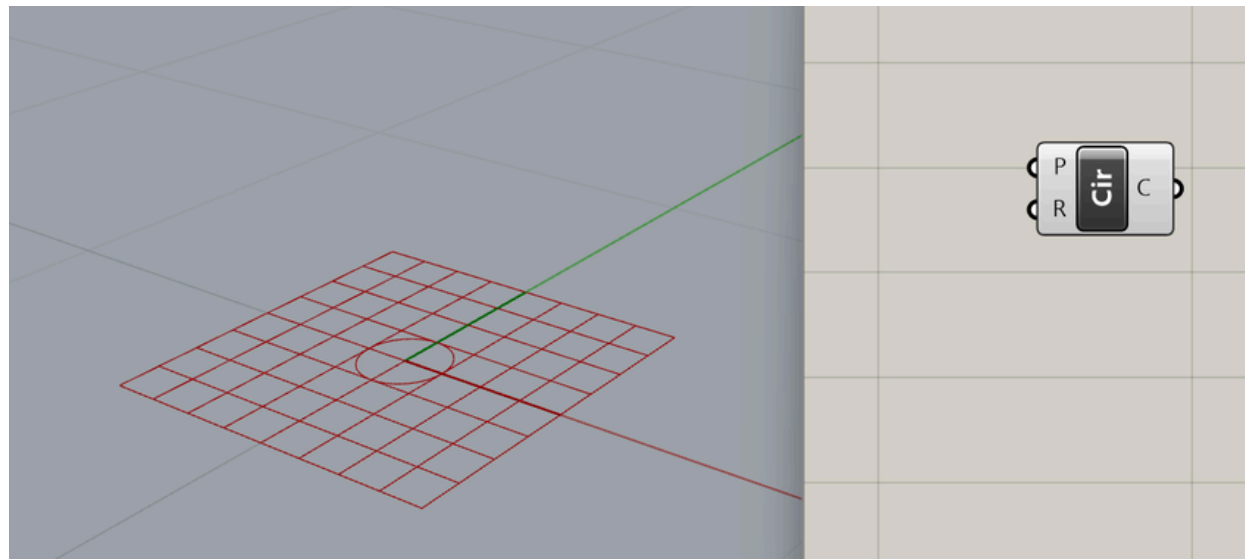
Aula 7

Para conseguir comunicar o raio da esfera fazer:

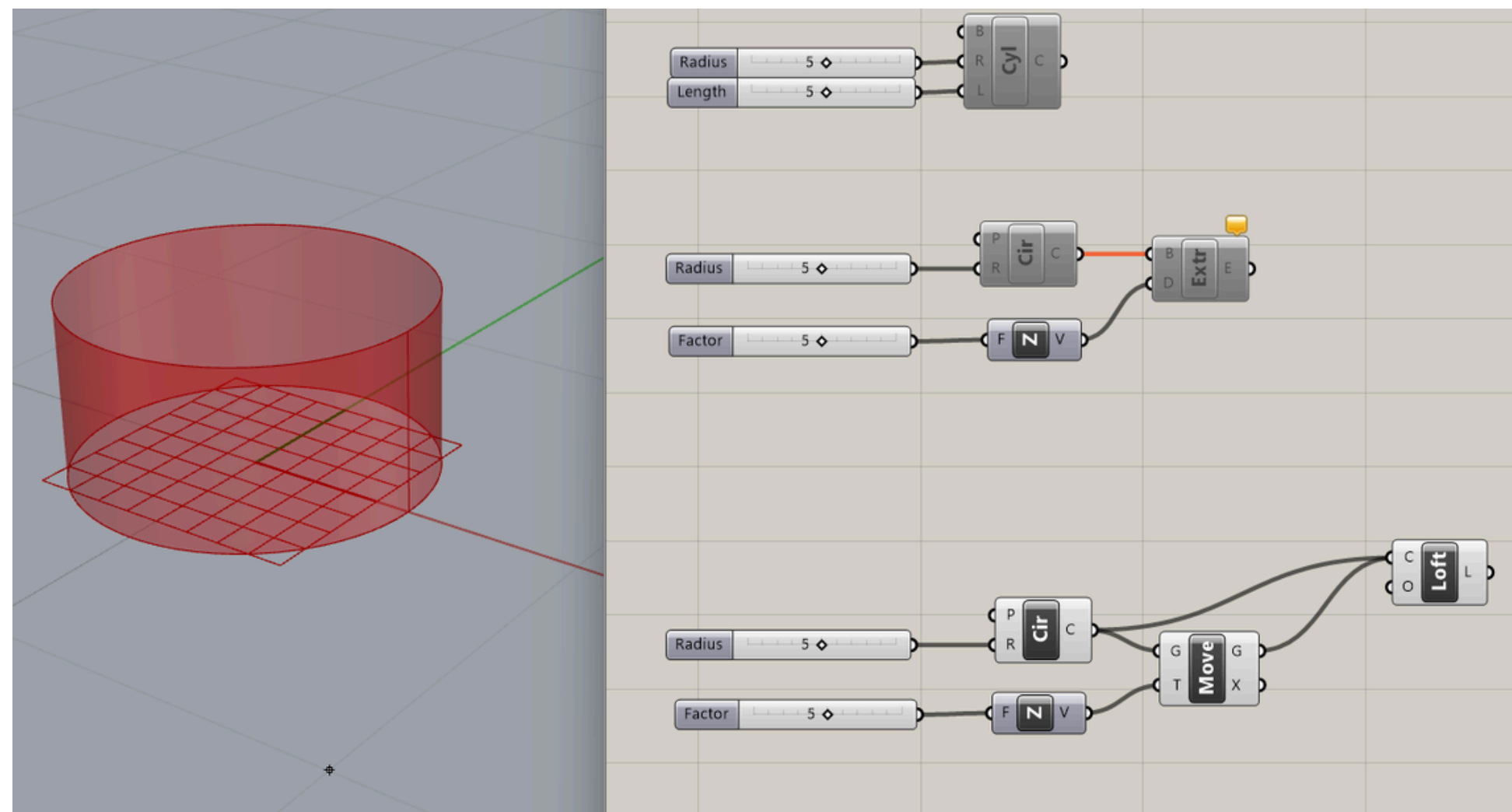
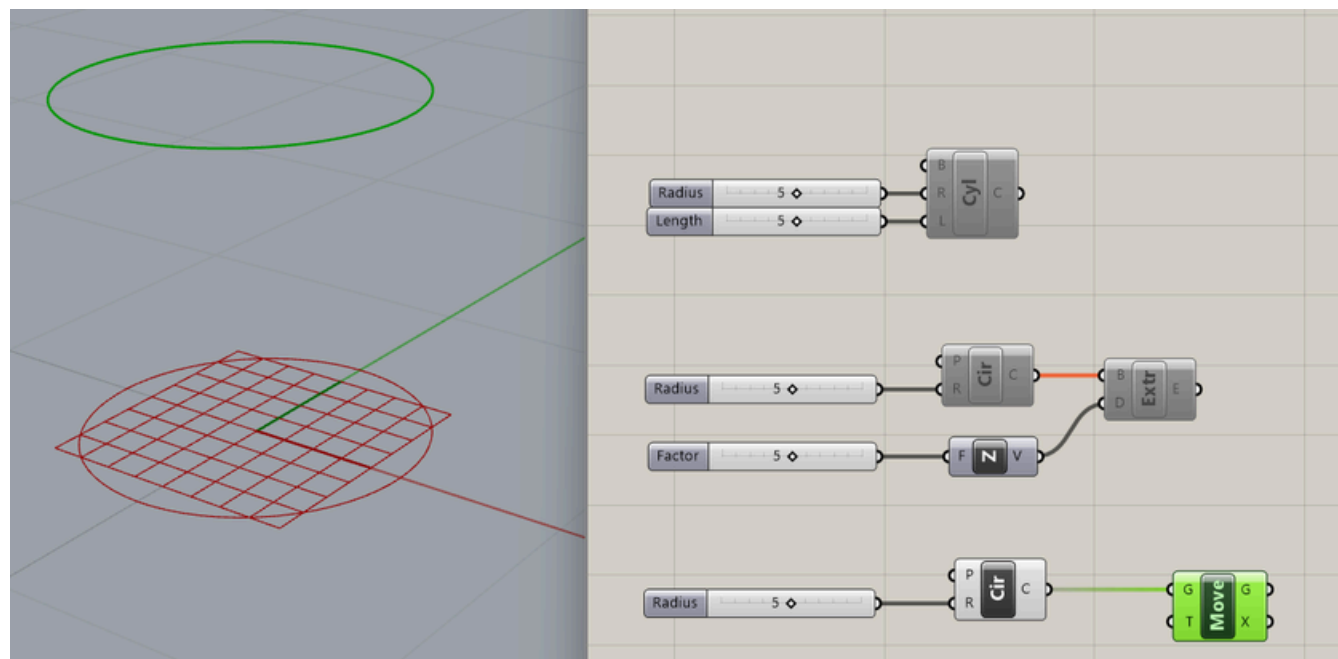


Cilindro

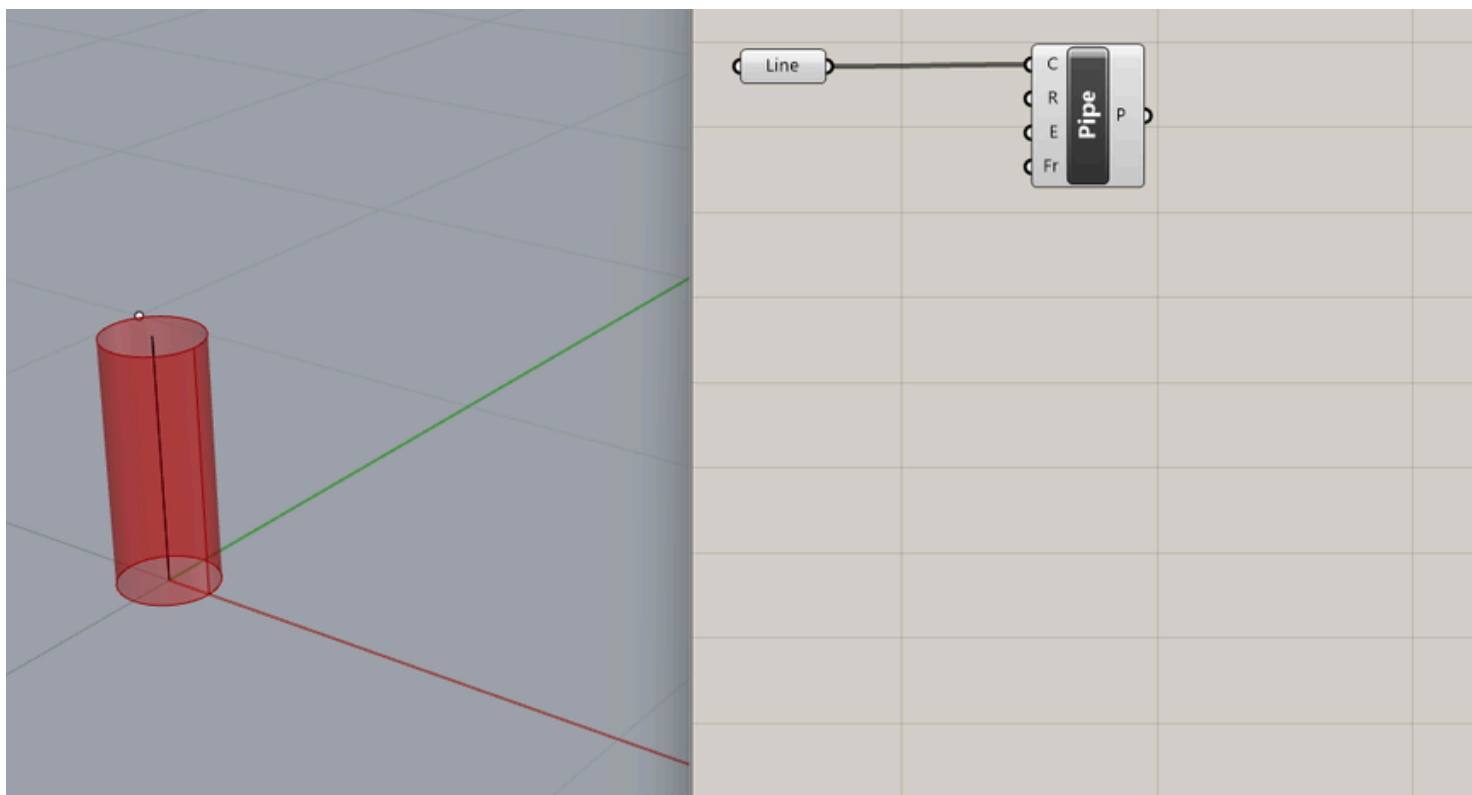




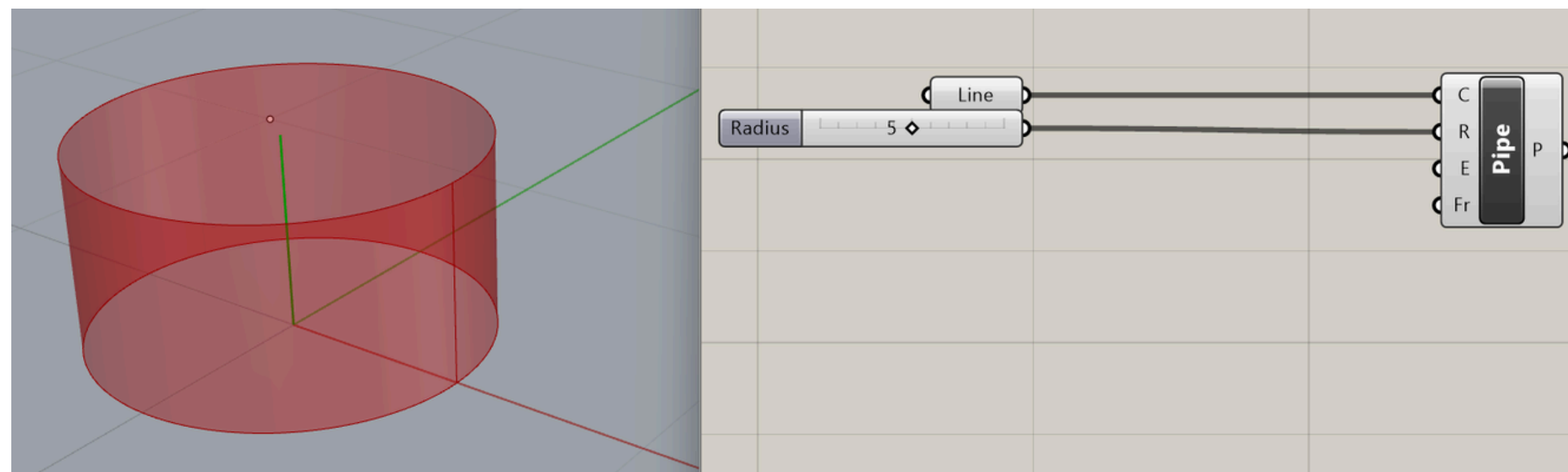
Cilindro- Extrude

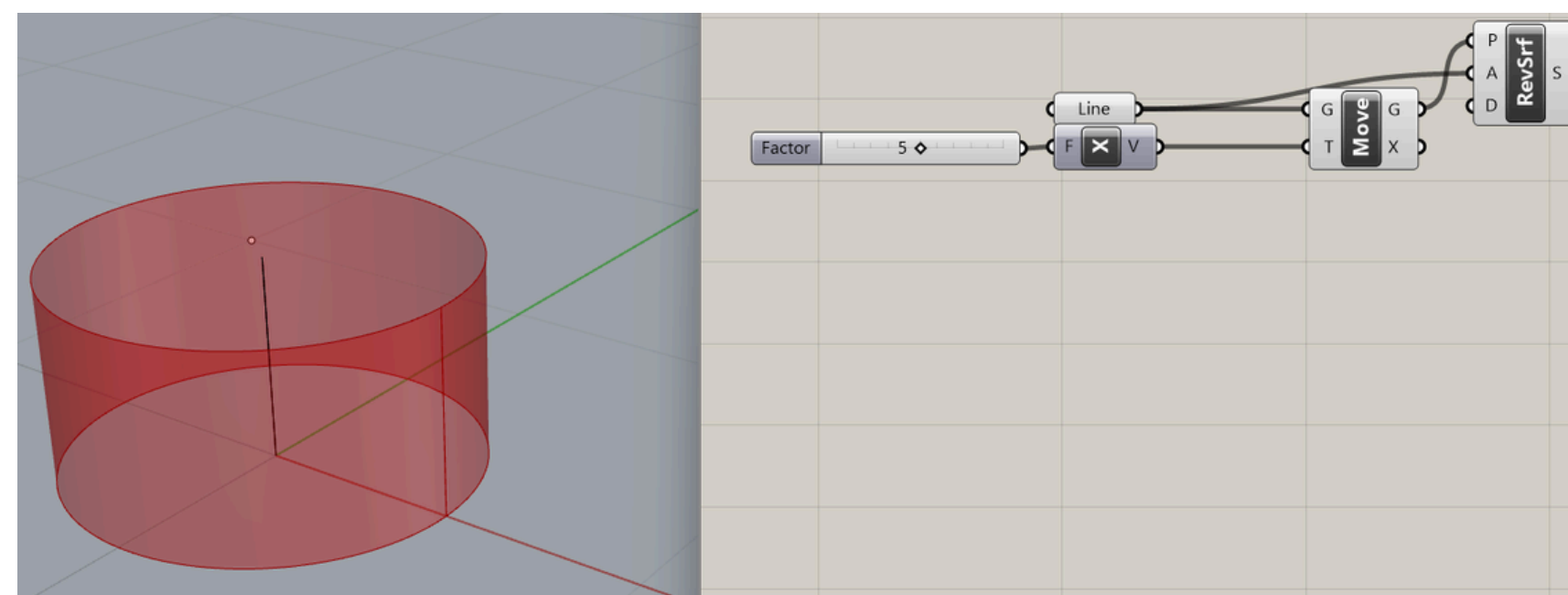
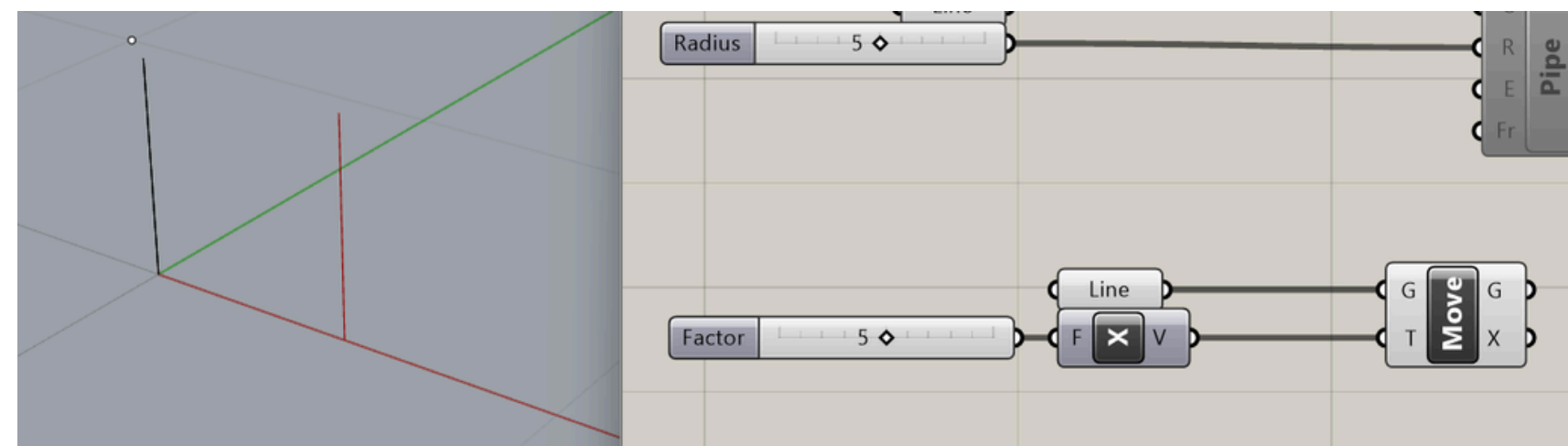
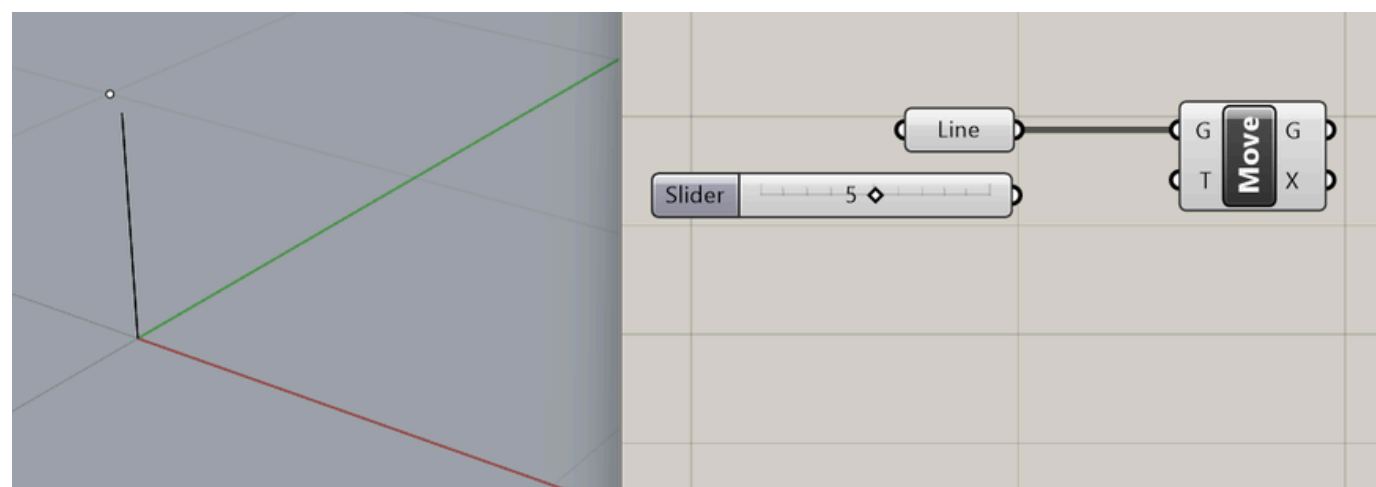


Cilindro- Loft

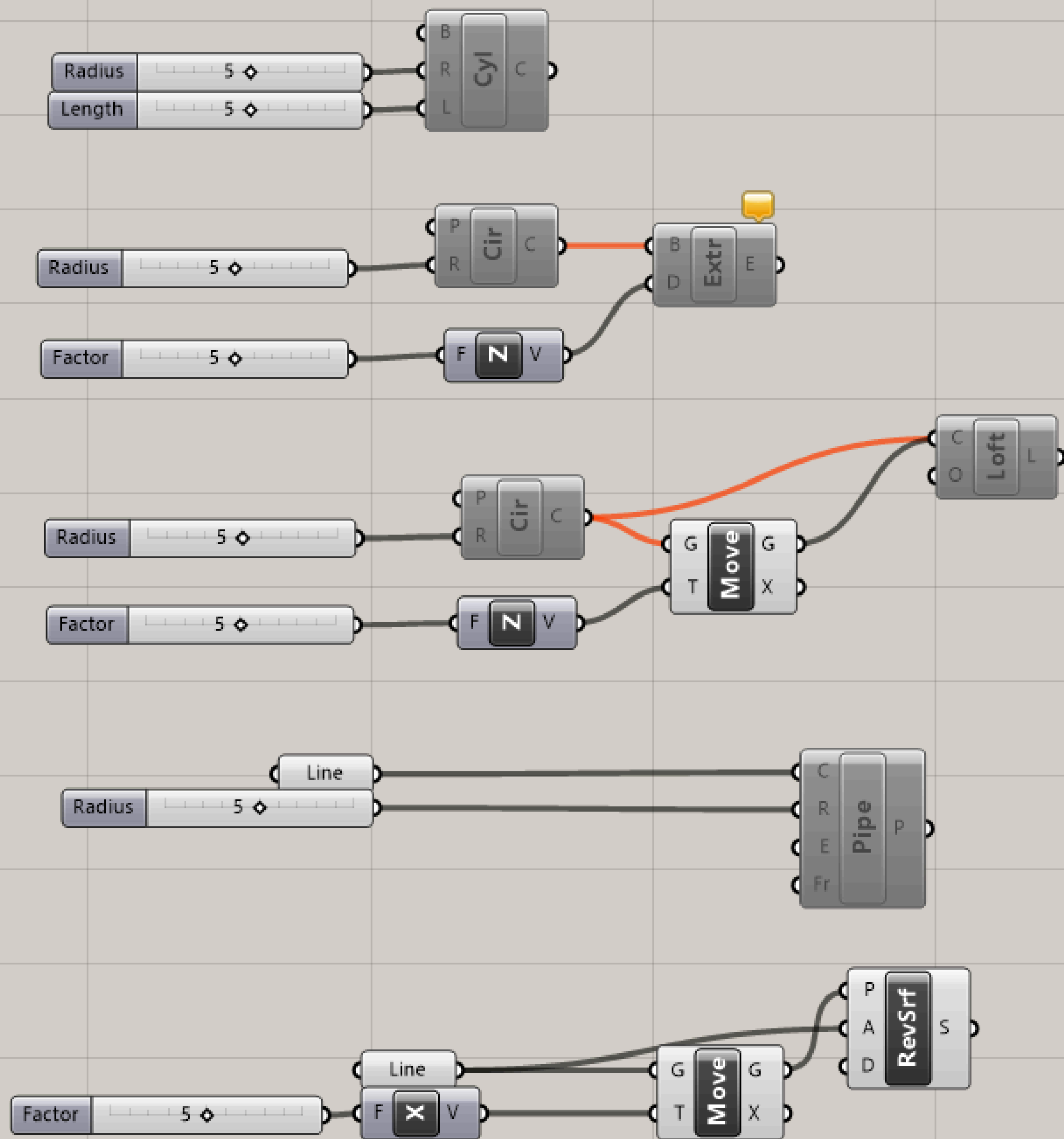


Cilindro- Pipe





Cilindro



Moluscos

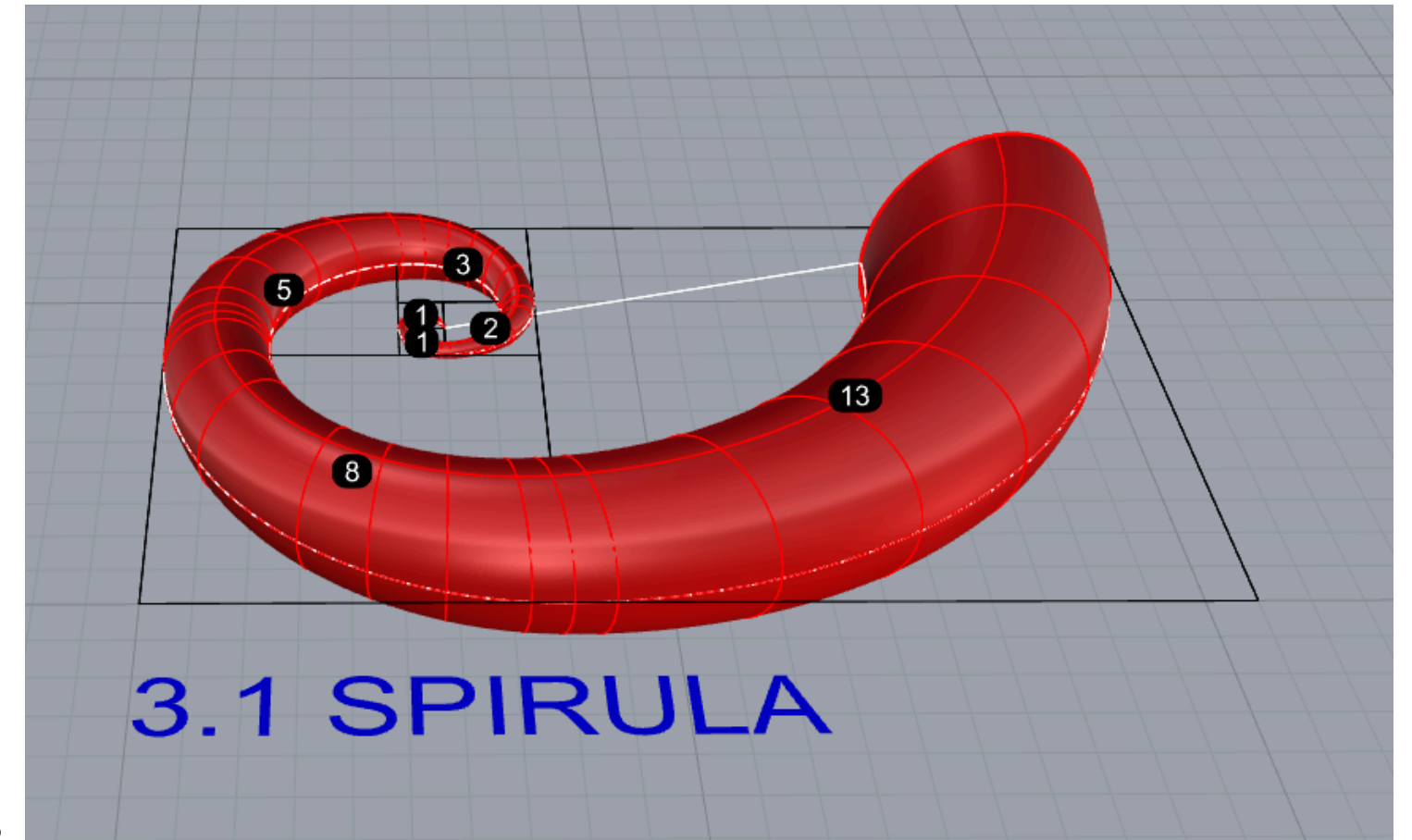
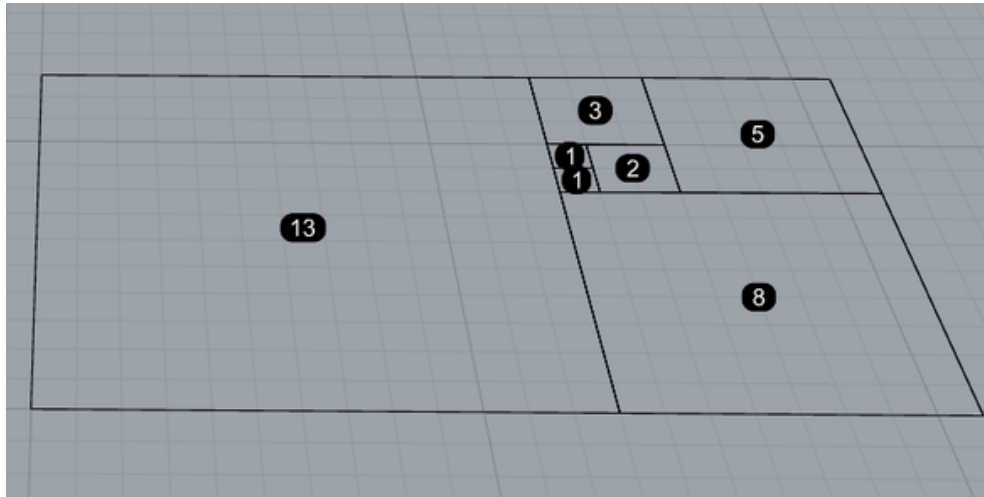
Espiral Plana

- Spirula
- Planorbi
- Nautilus

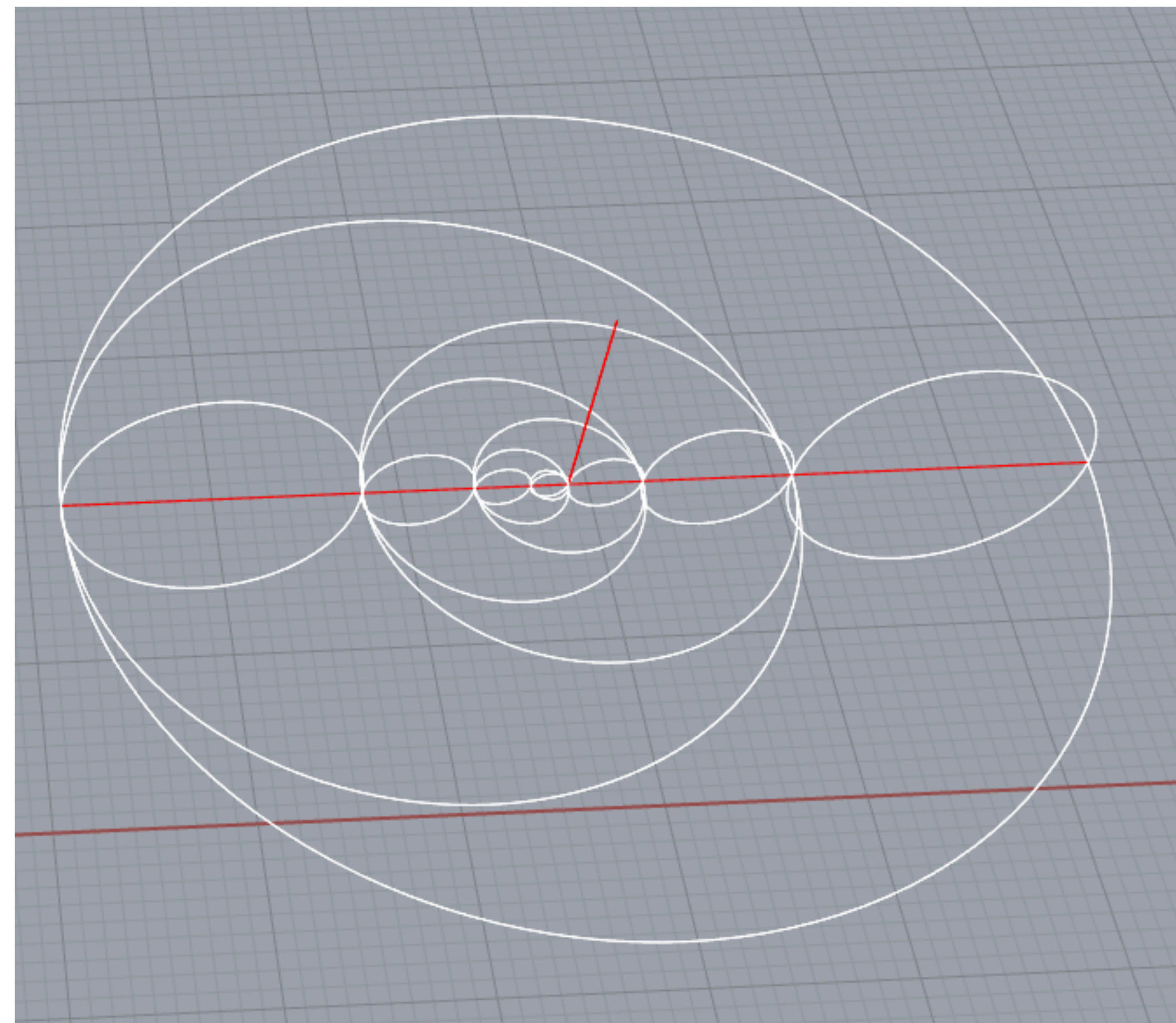
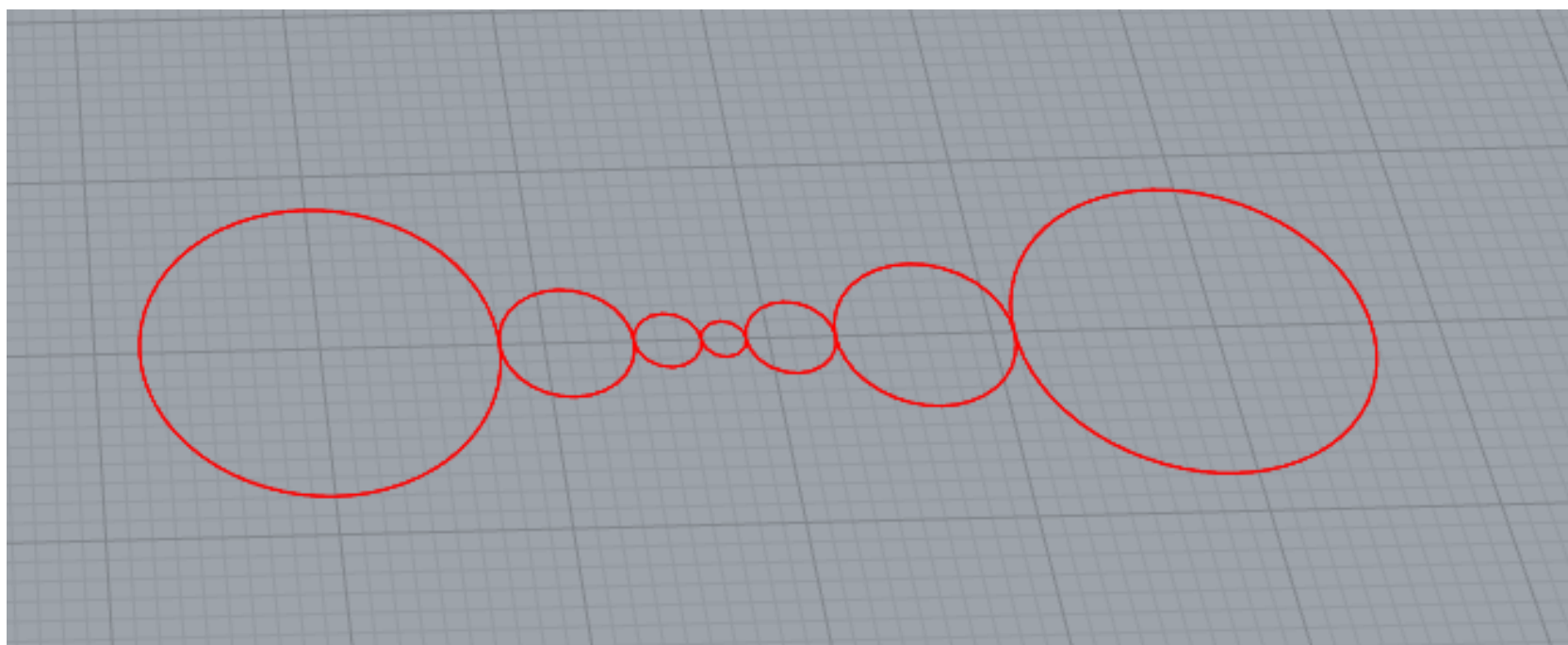
Espiral Cónica

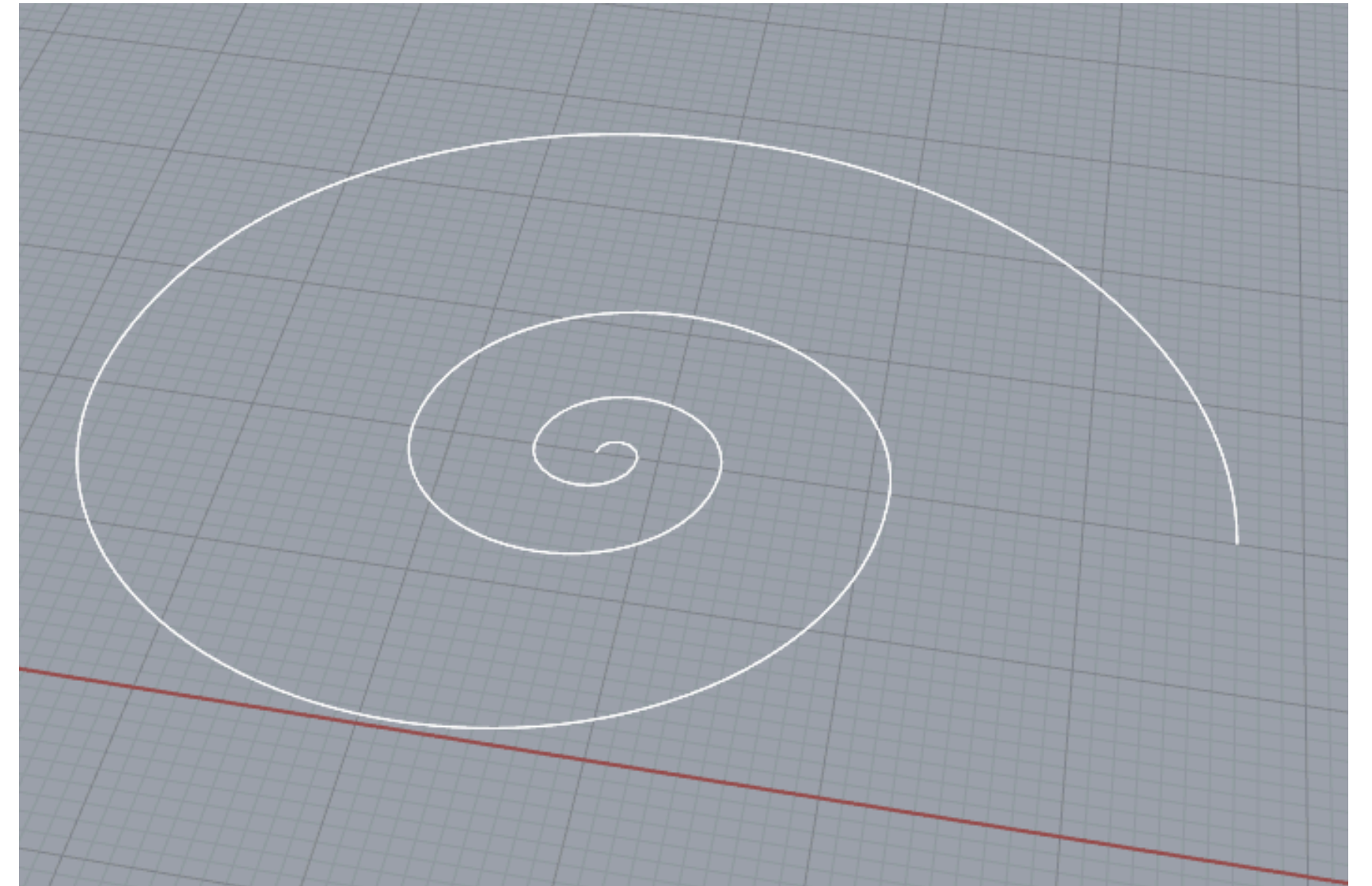
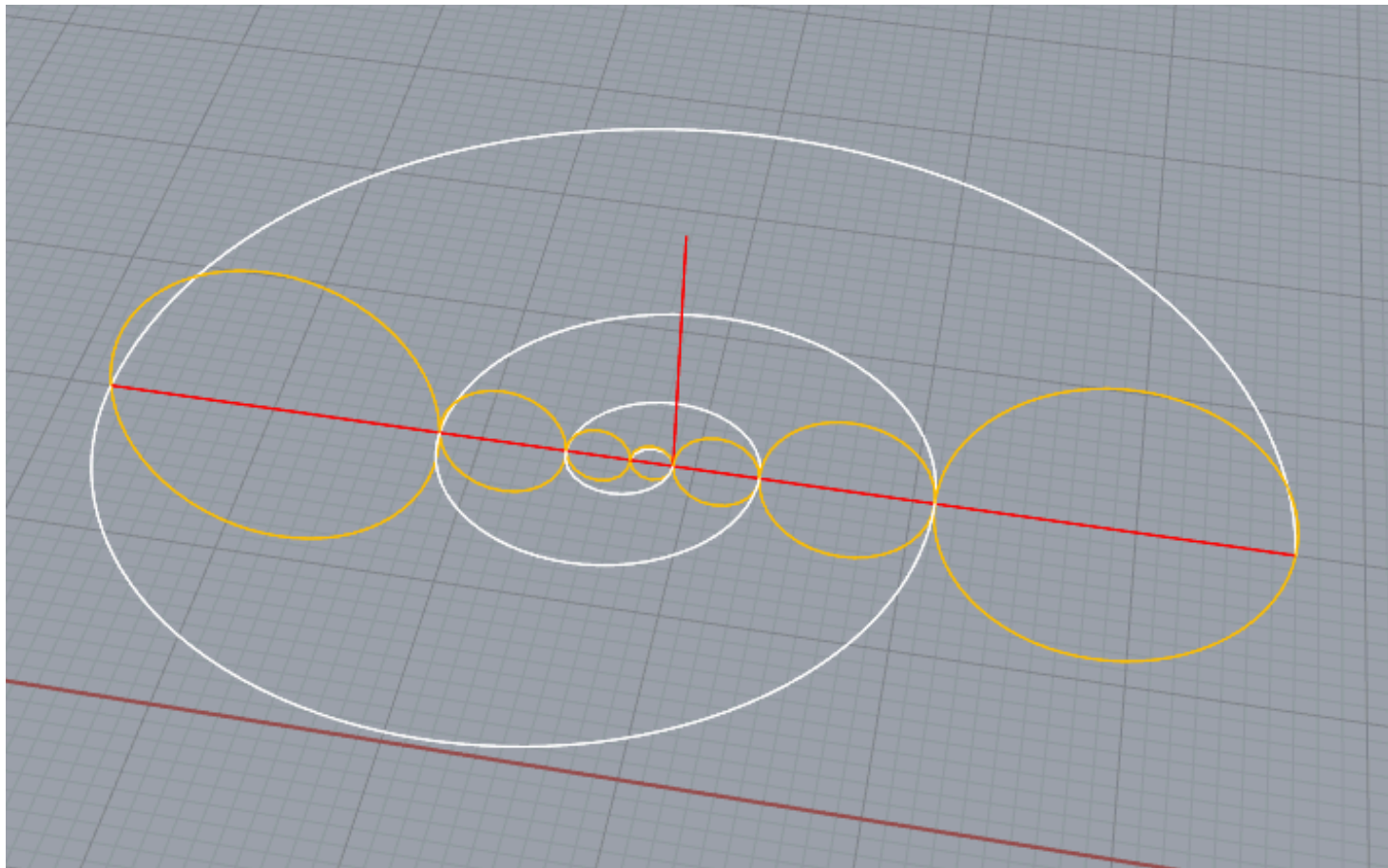
- Caracol
- Caramujo do Mar

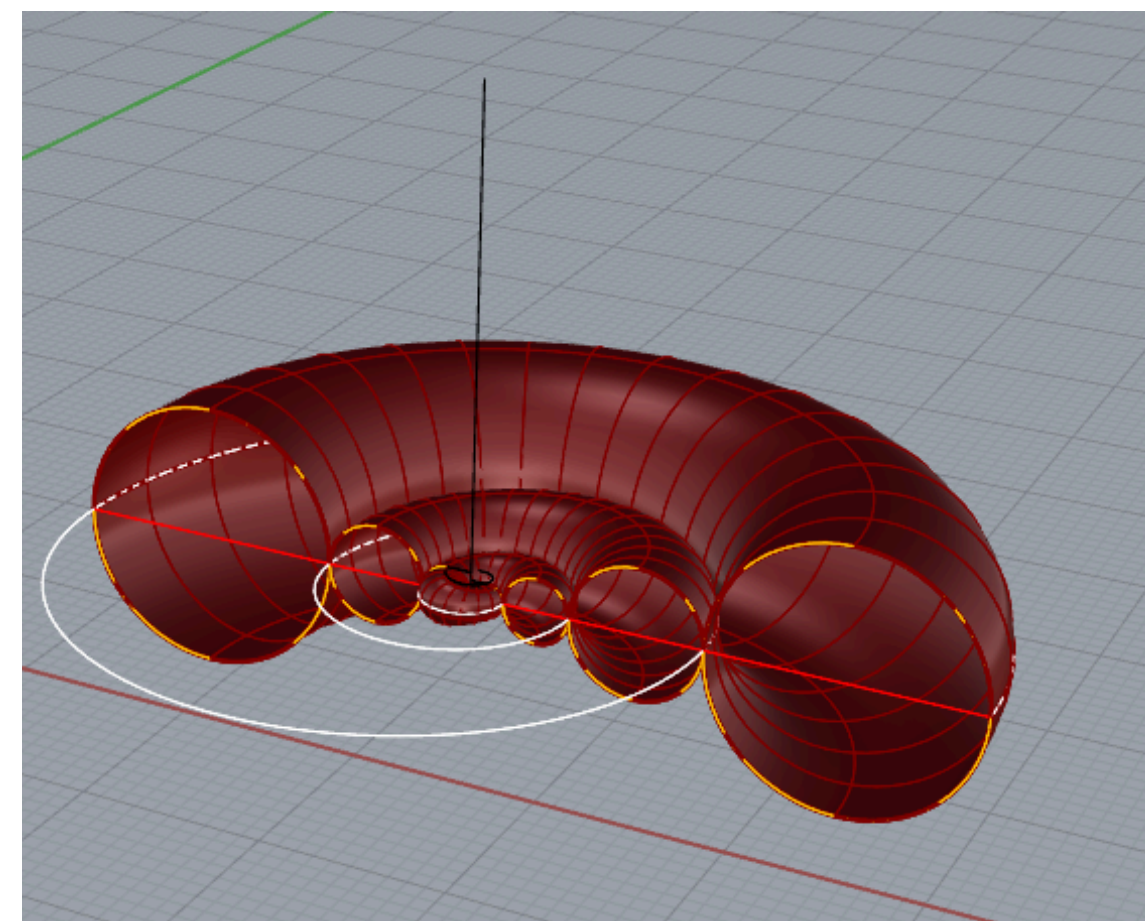
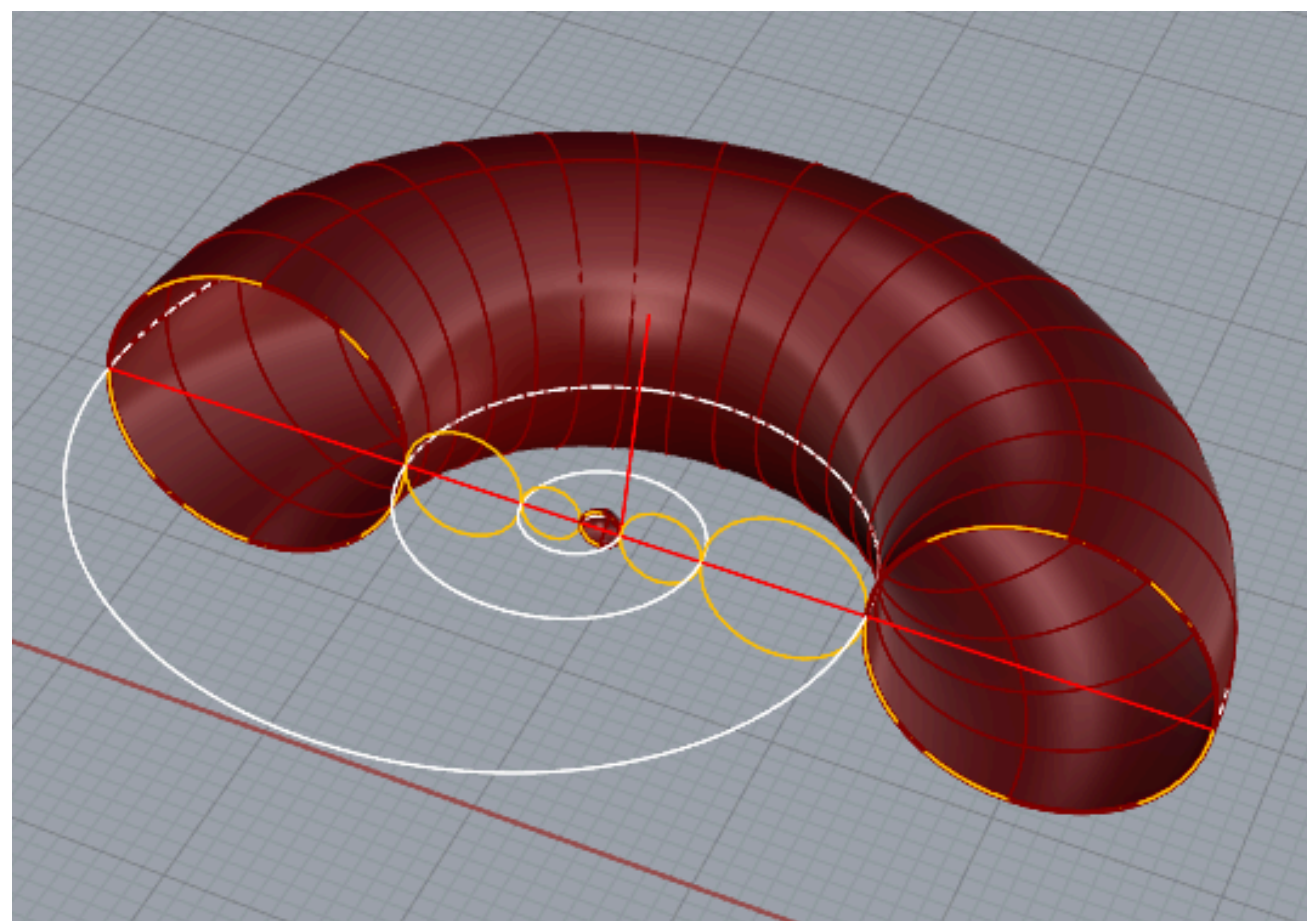
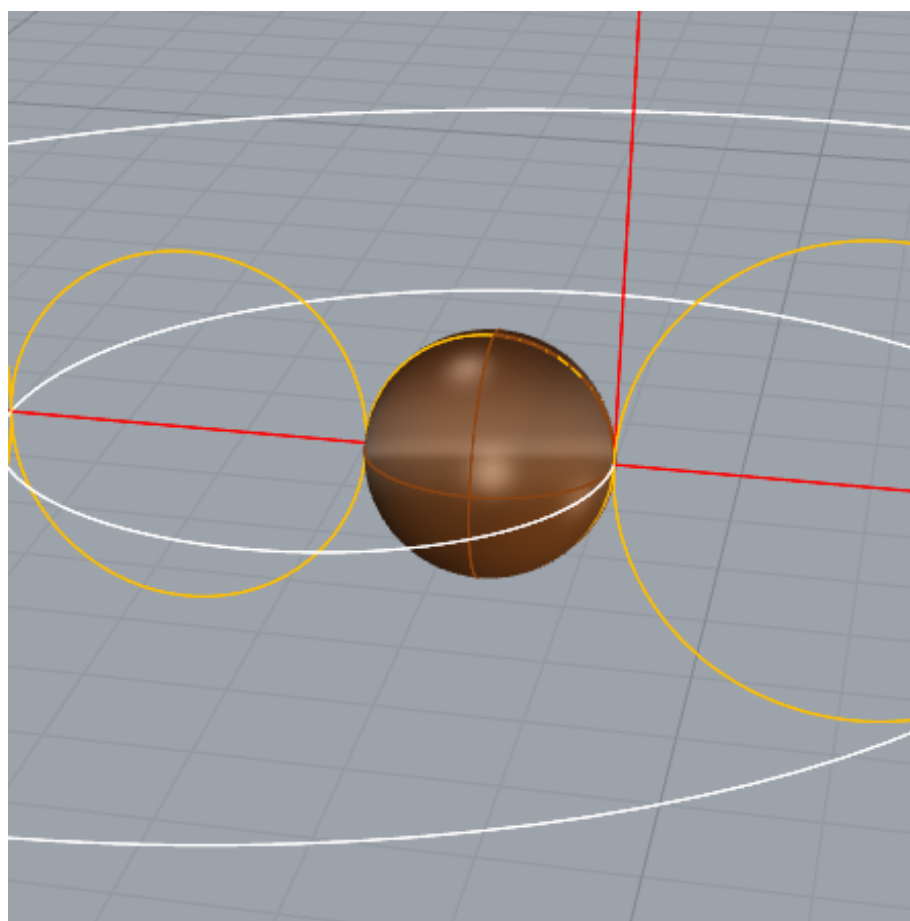
Moluscos_Spirula



sweep2



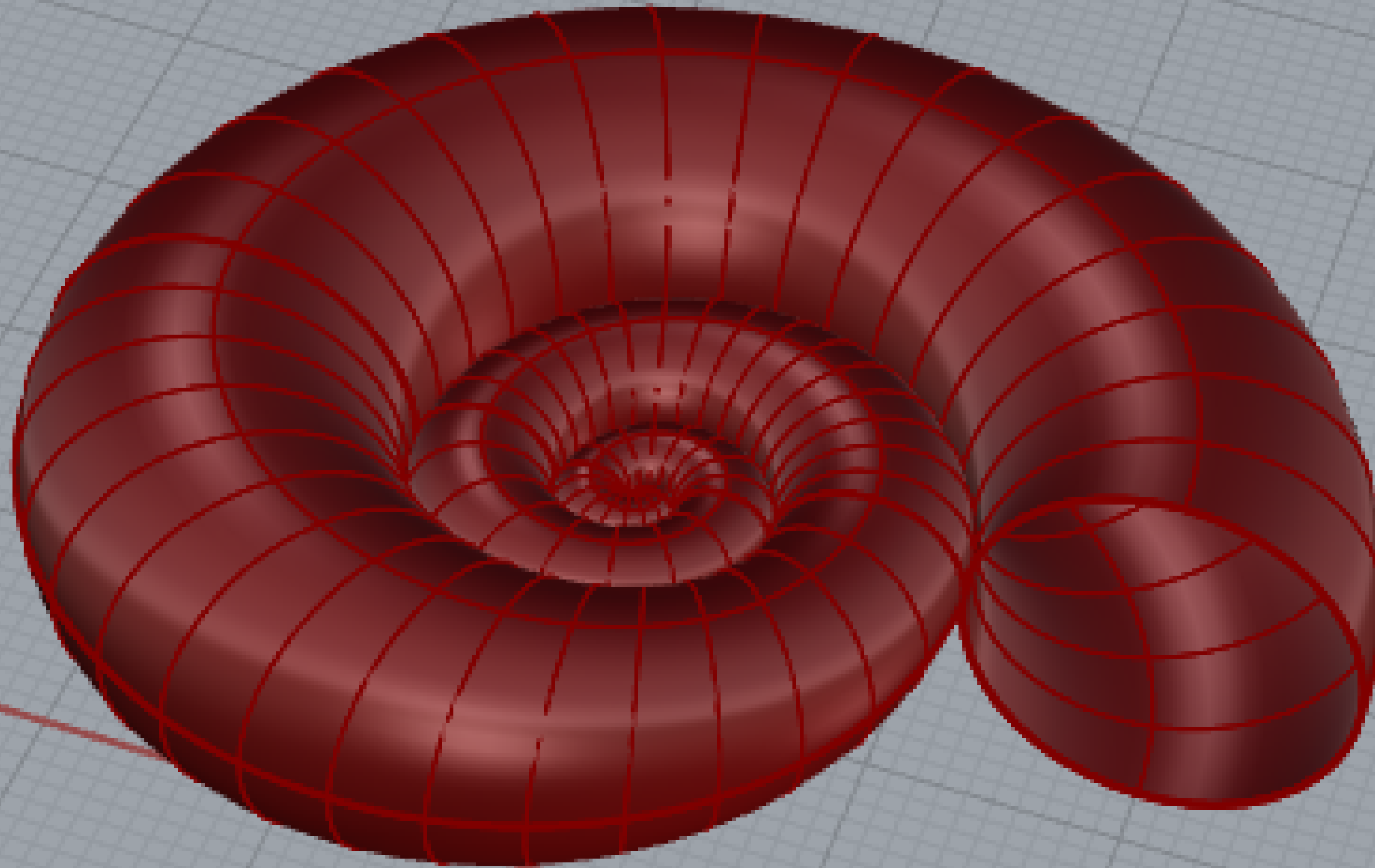




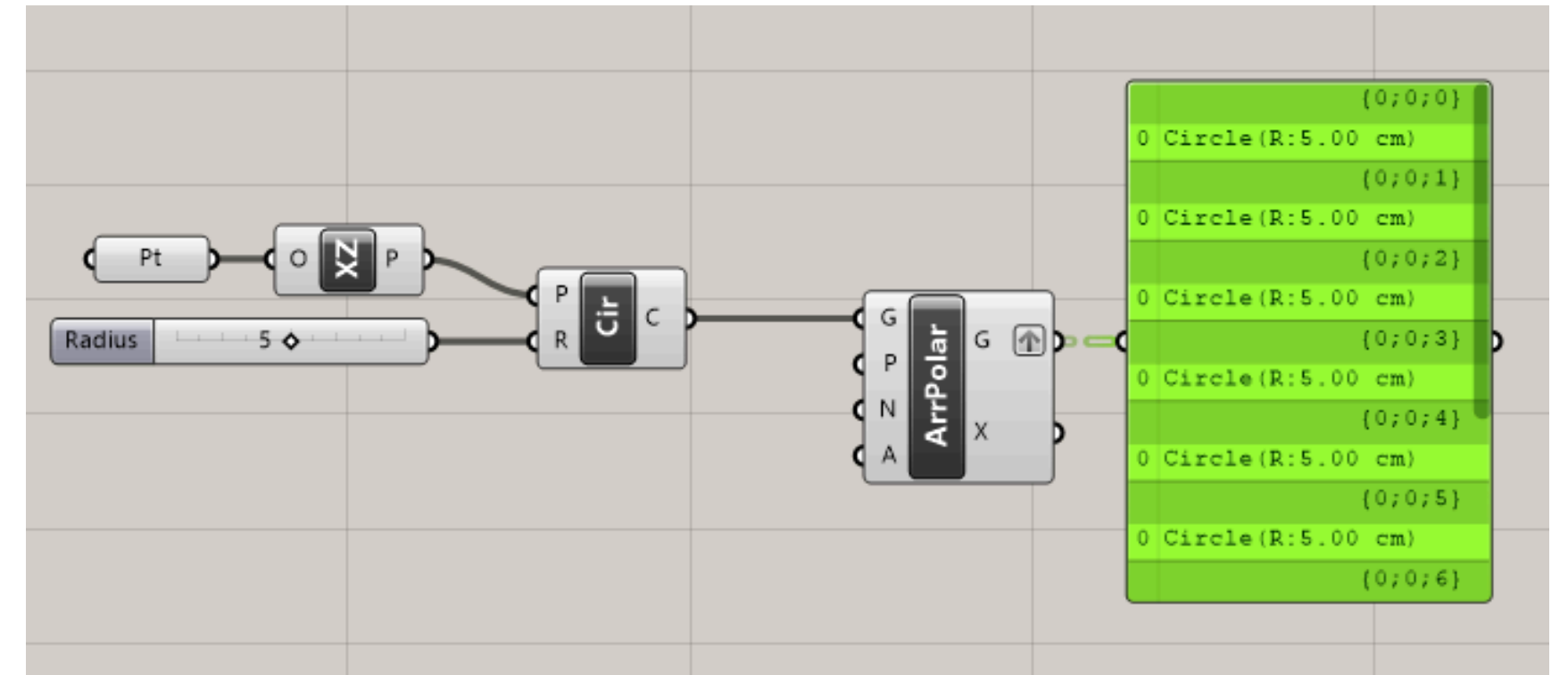
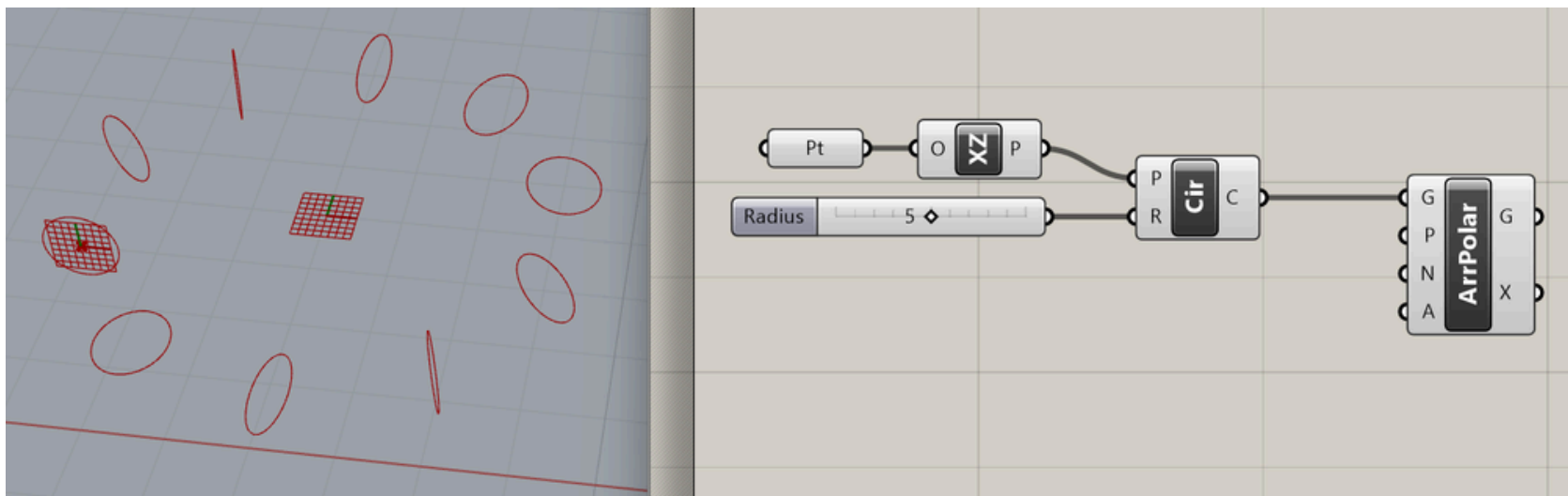
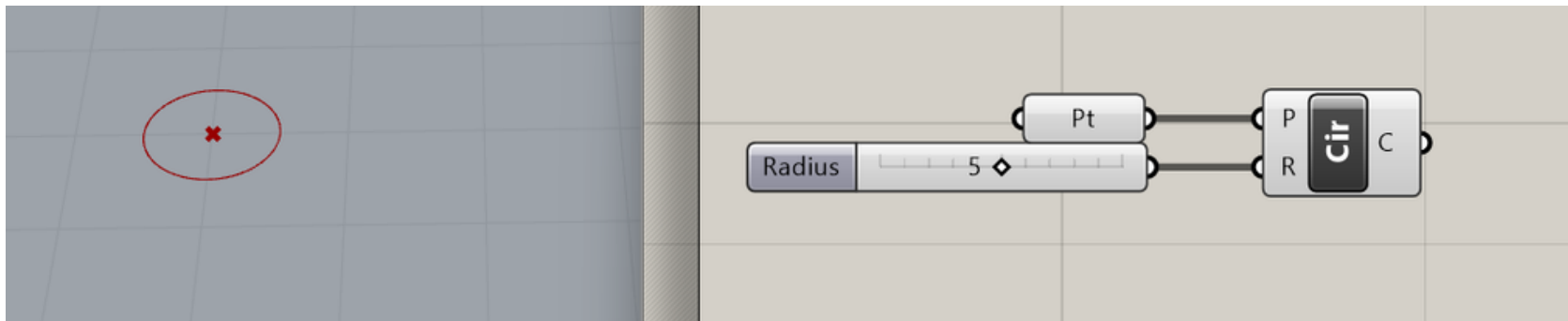
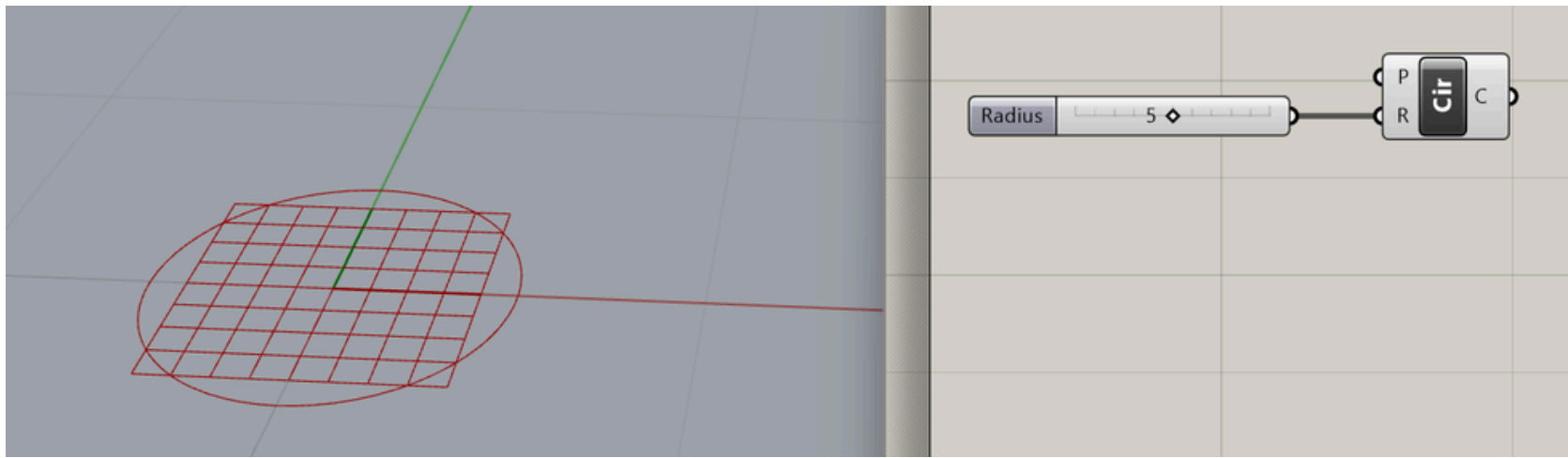
Planorbis

Aula 9

Planorbis

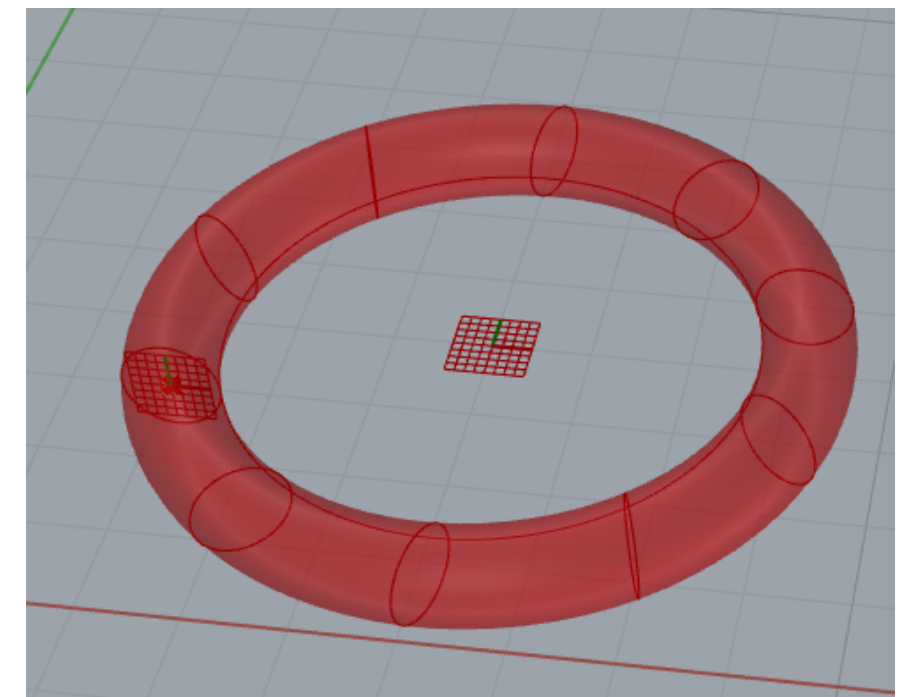
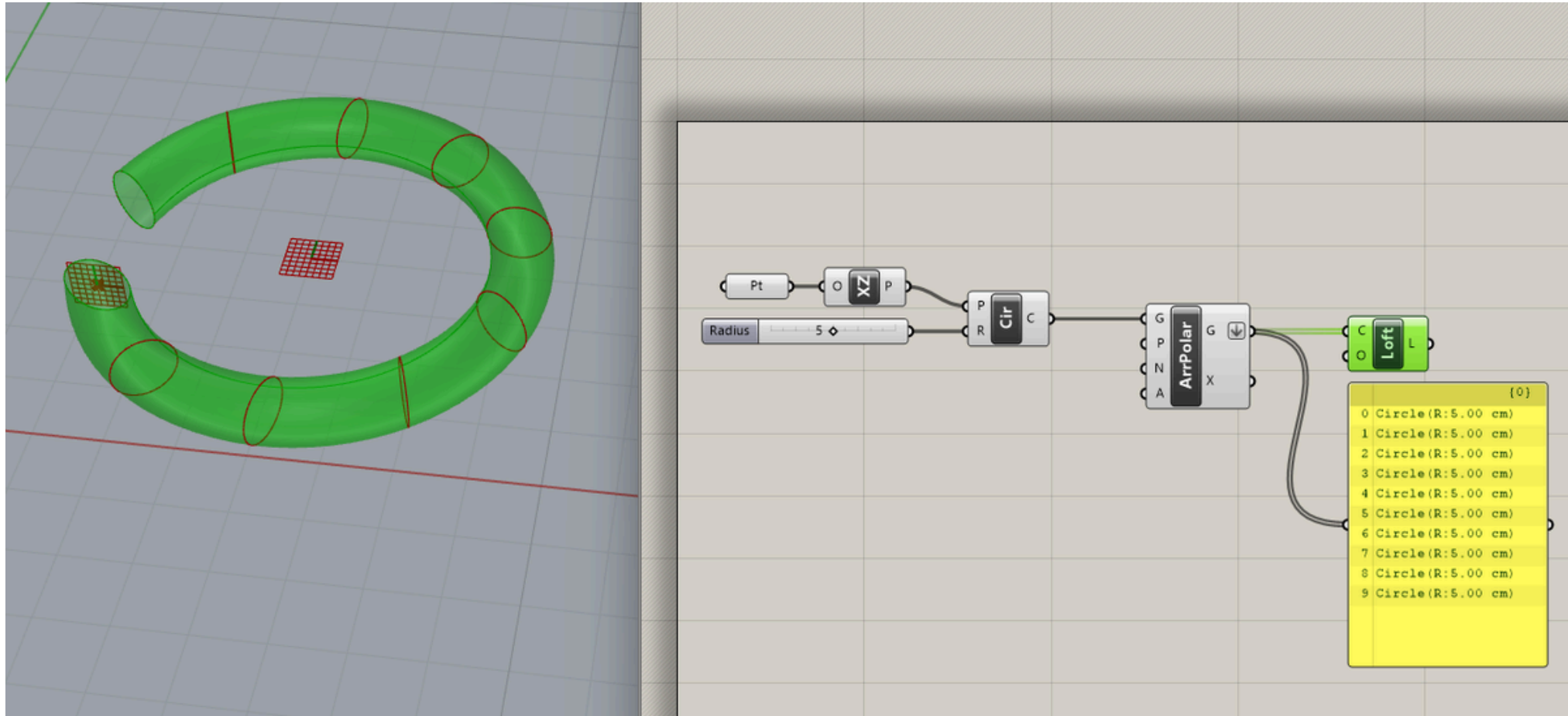


Aula 9



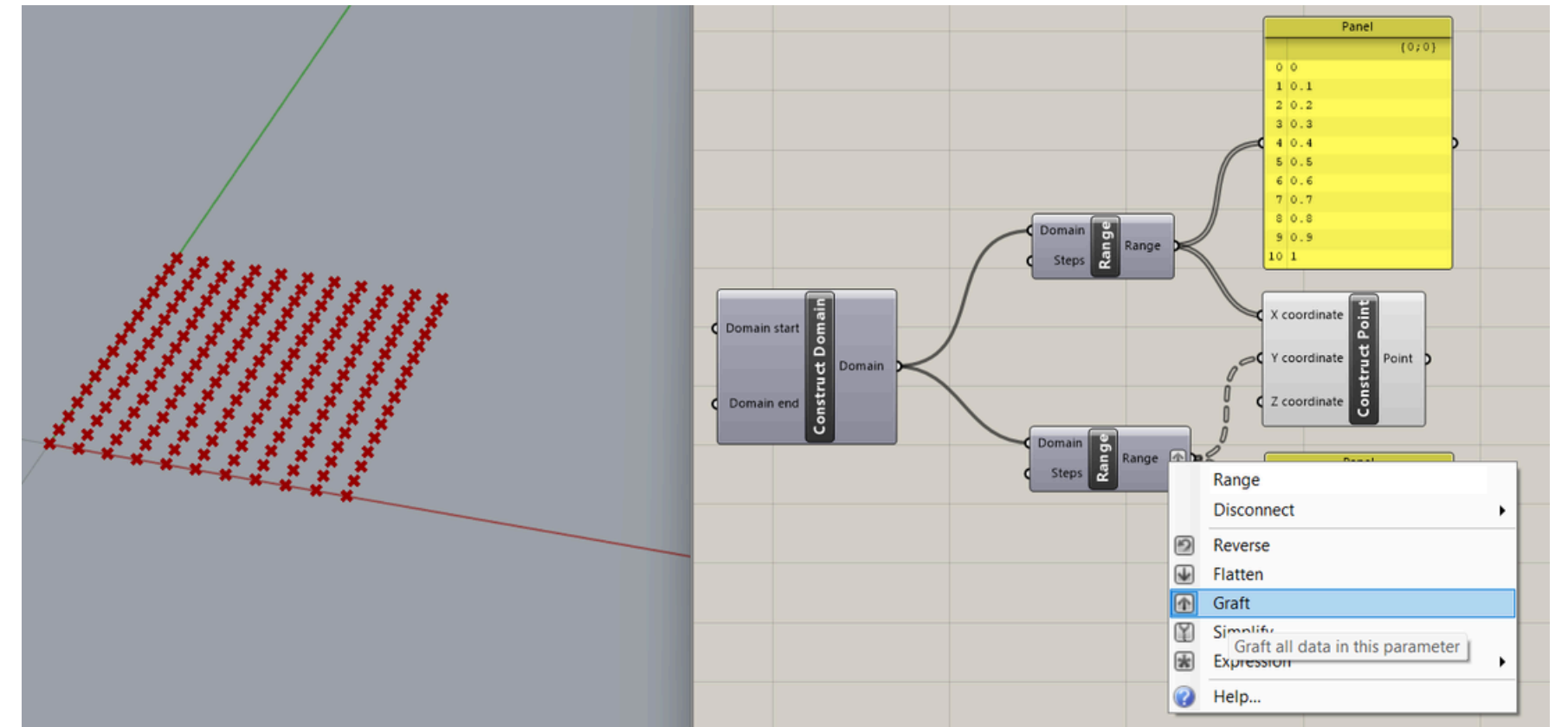
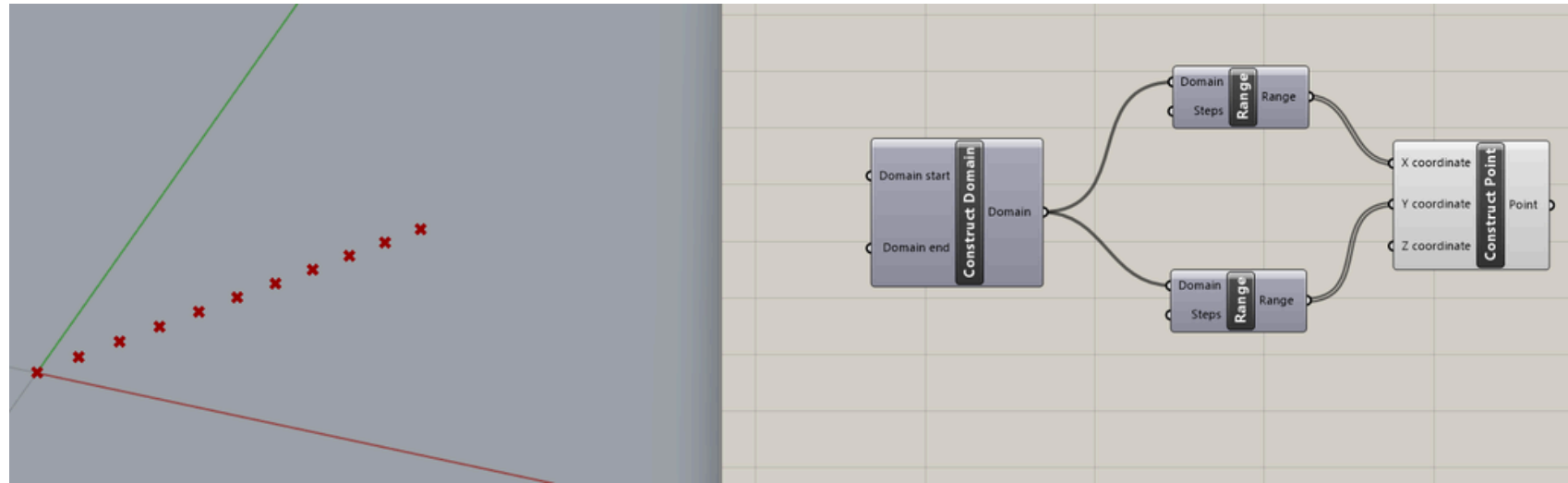
Toru

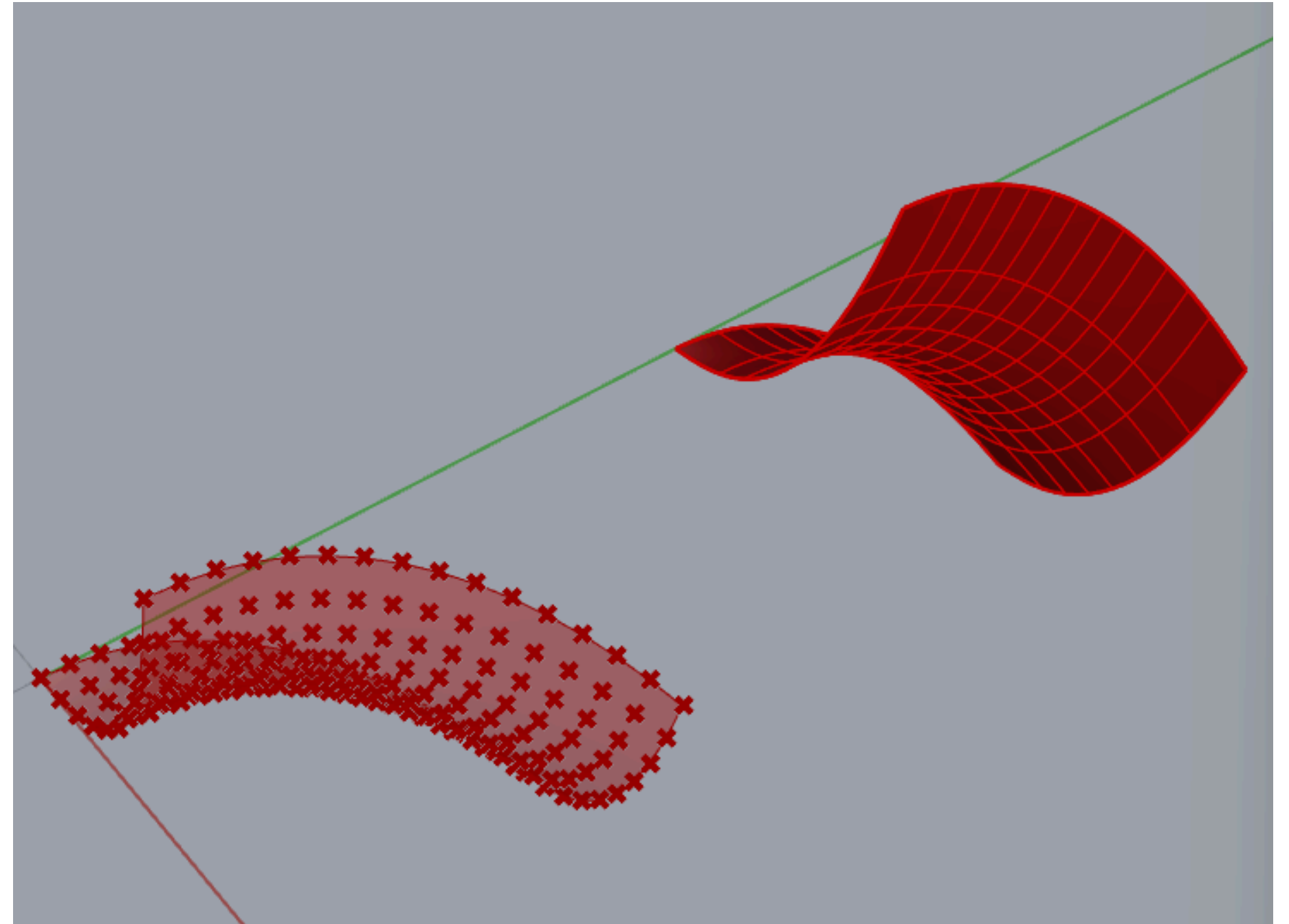
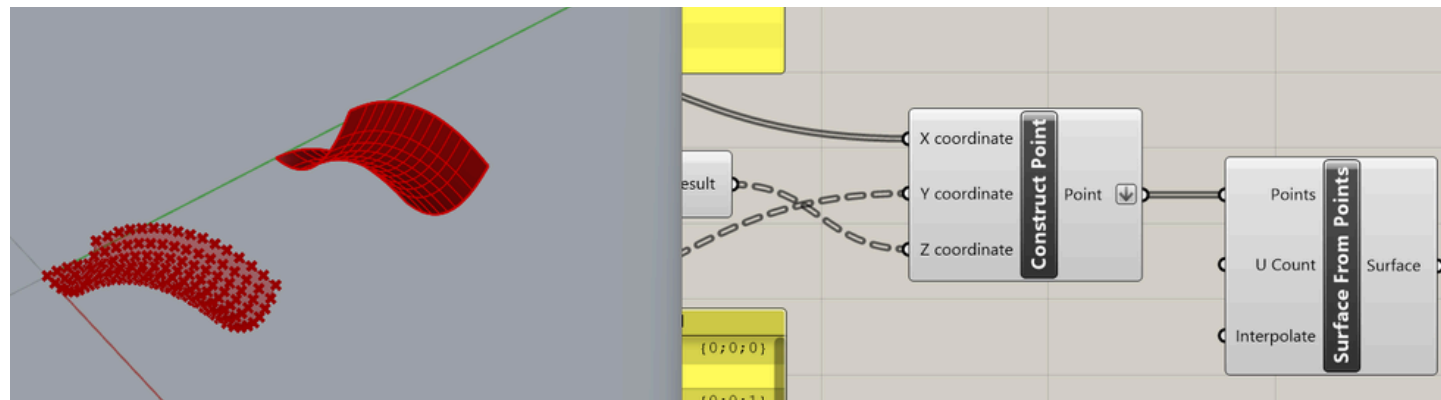
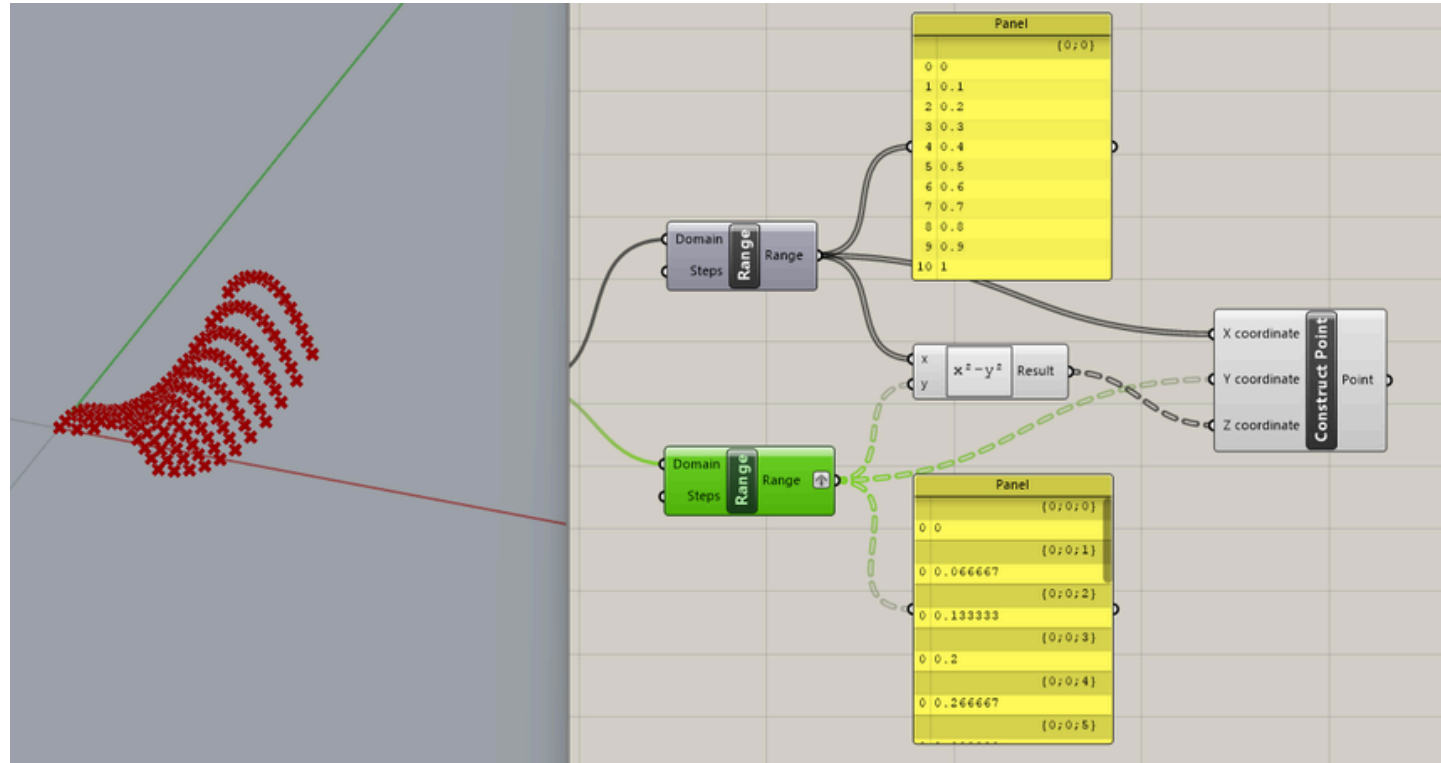
Aula 9

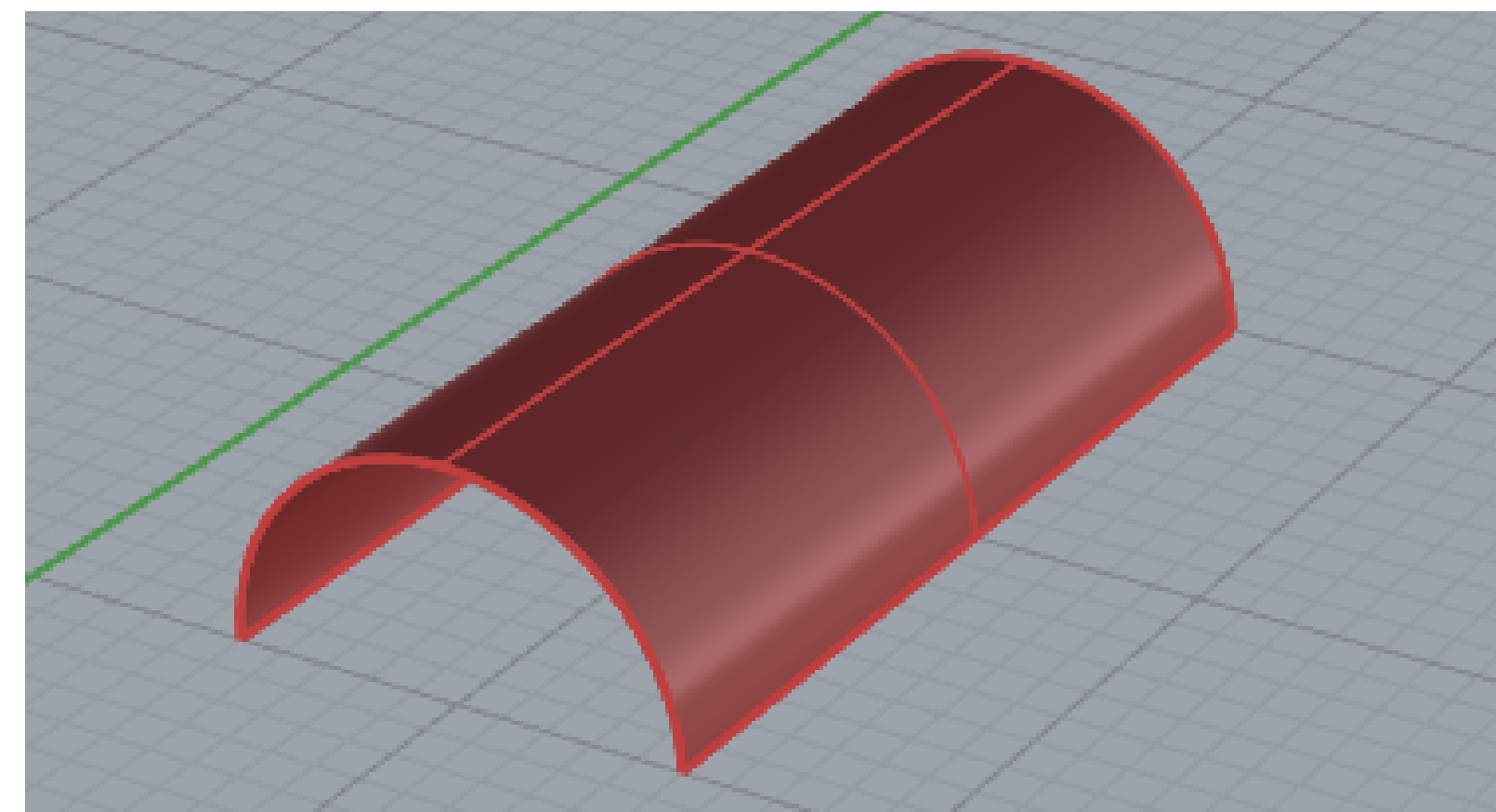
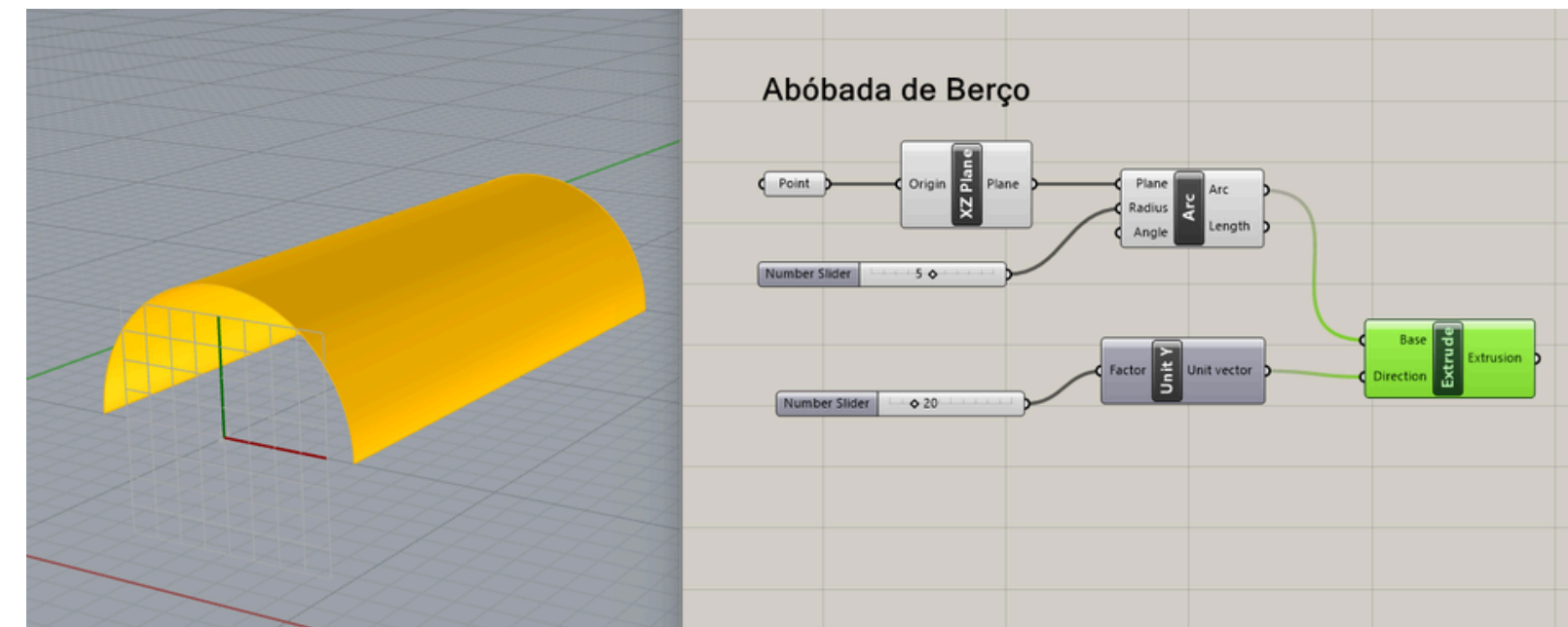
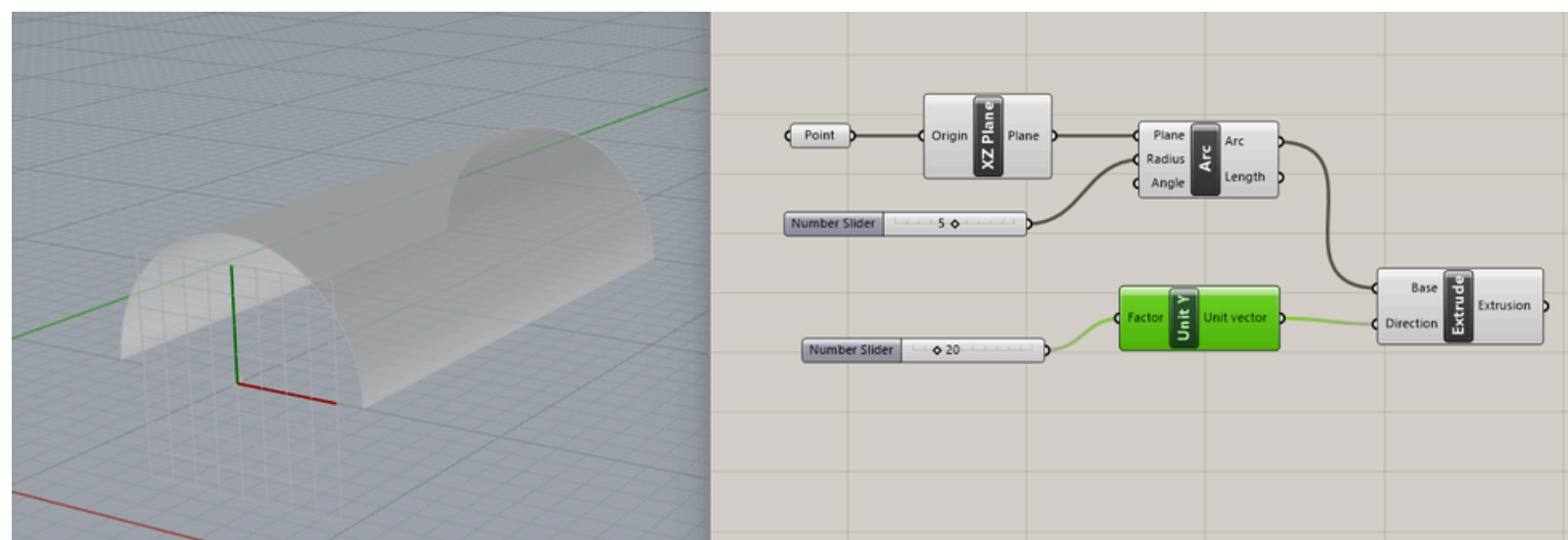
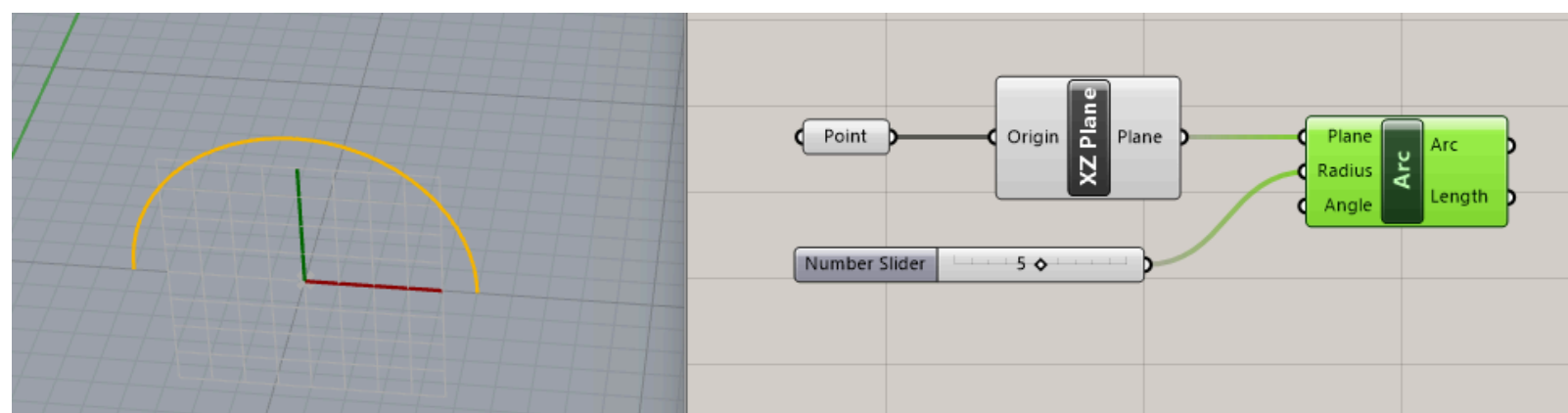
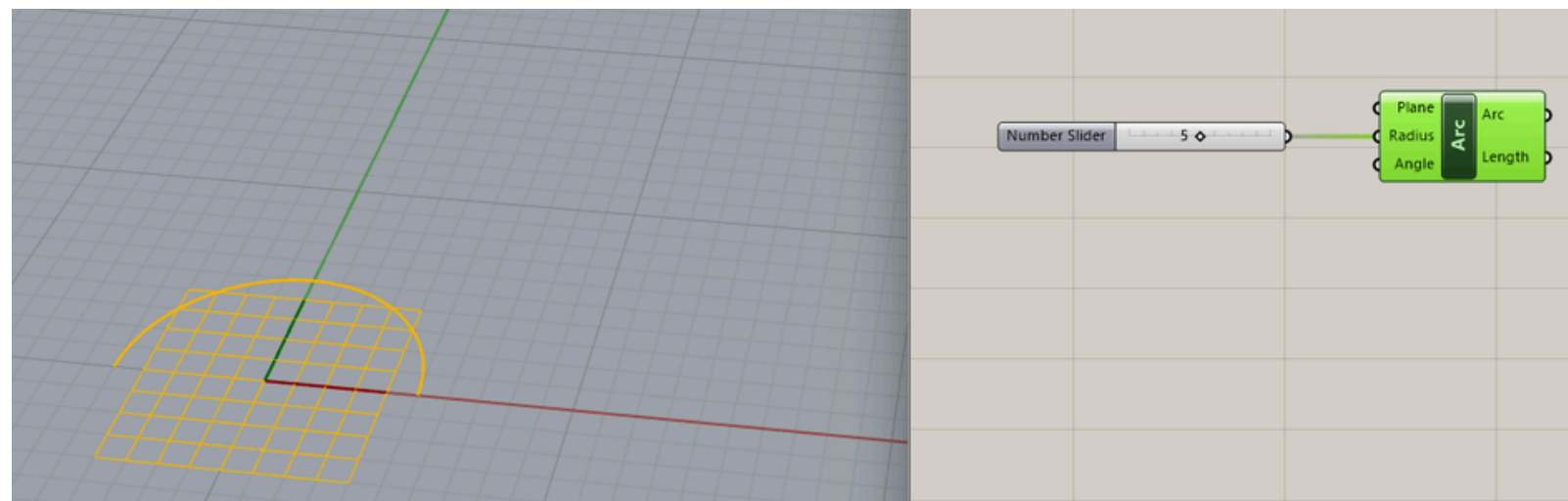


Toru

Aula 9

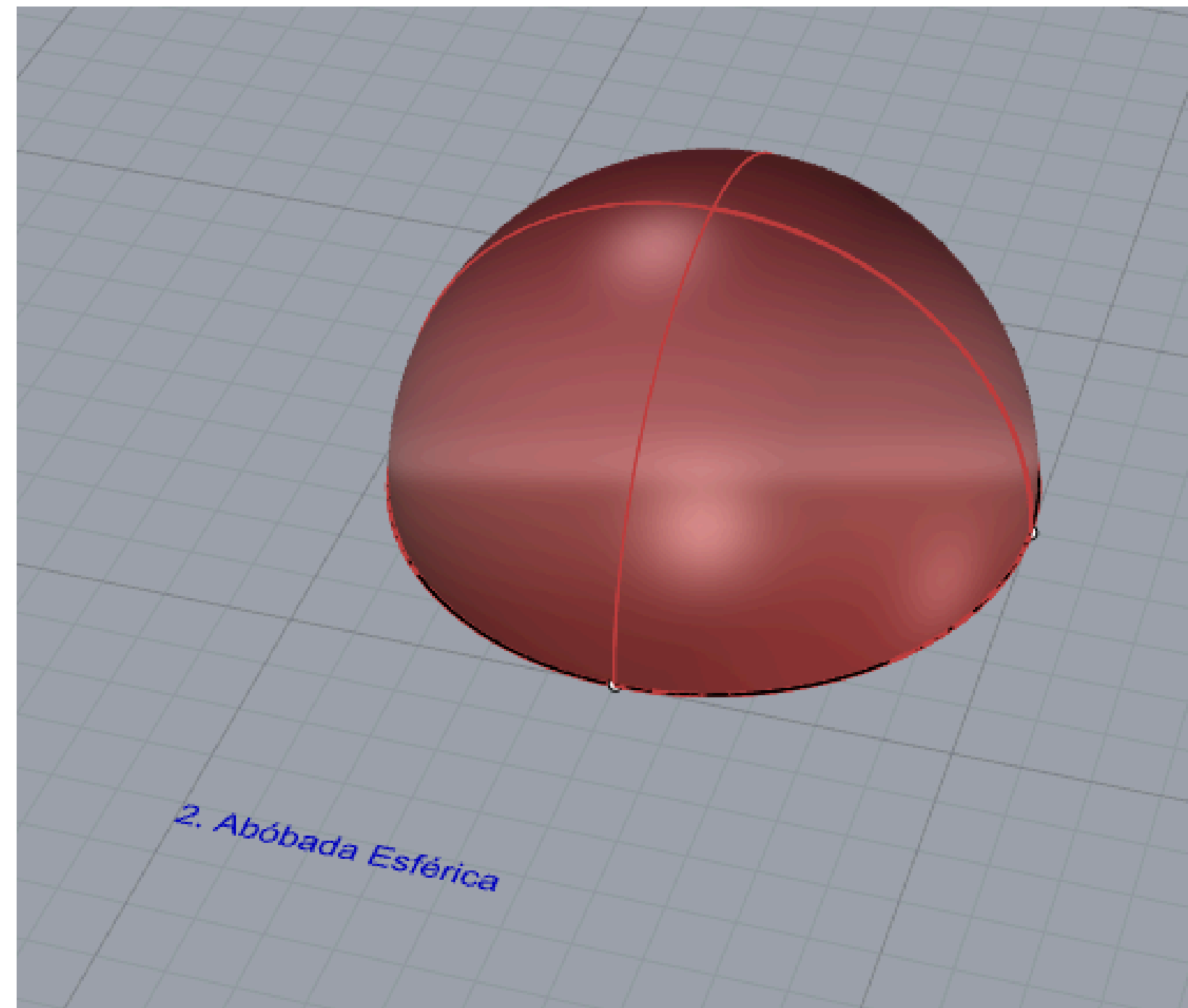
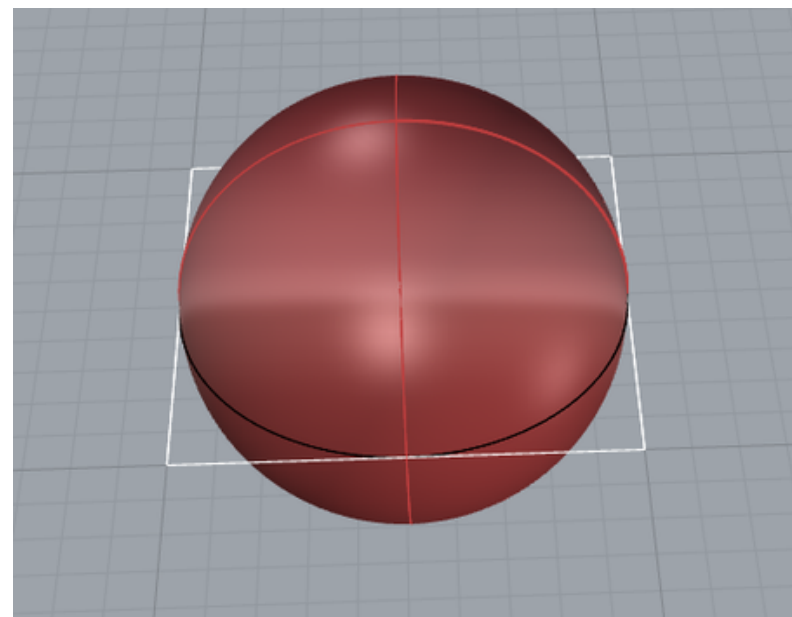
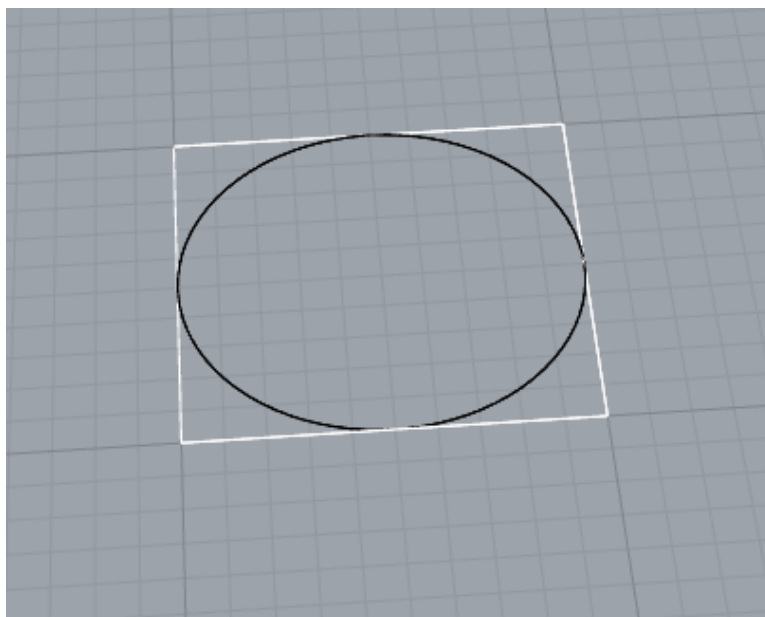




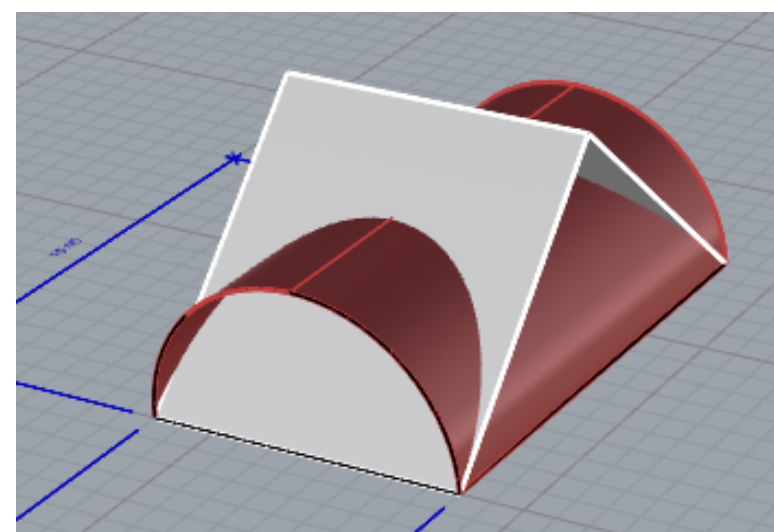
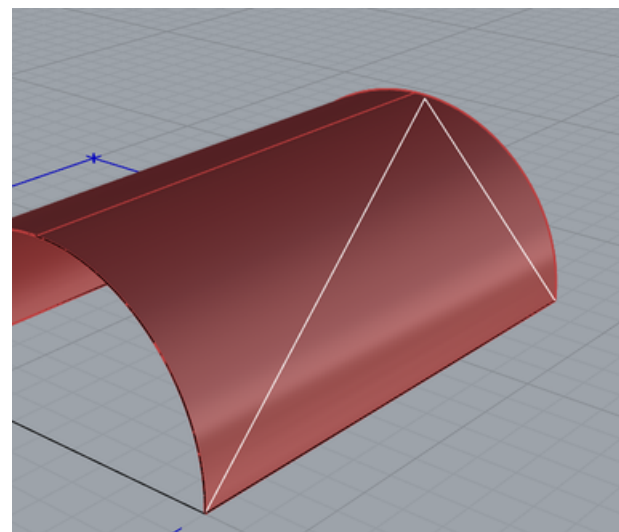
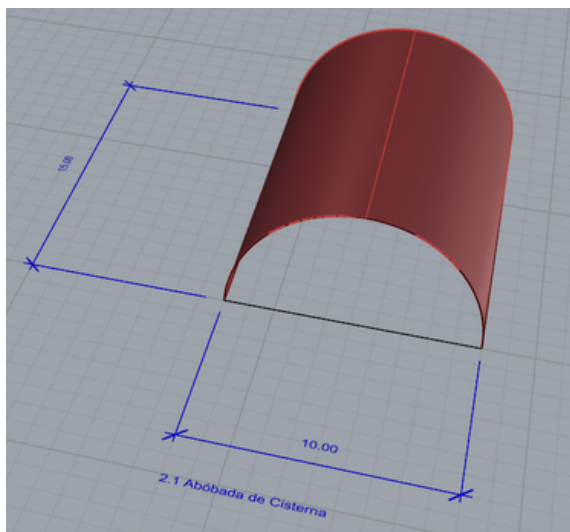


Abobada de Berço

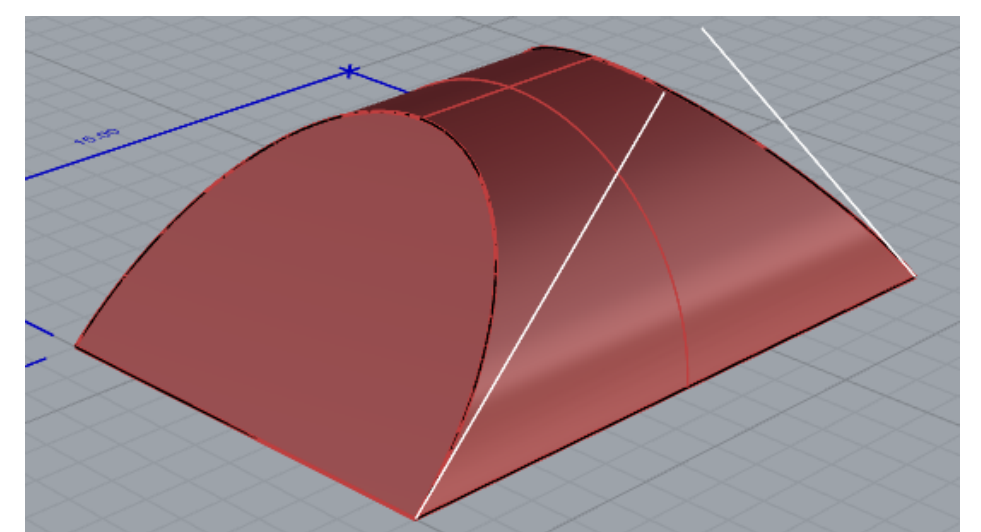
Inicio do Trabalho 2

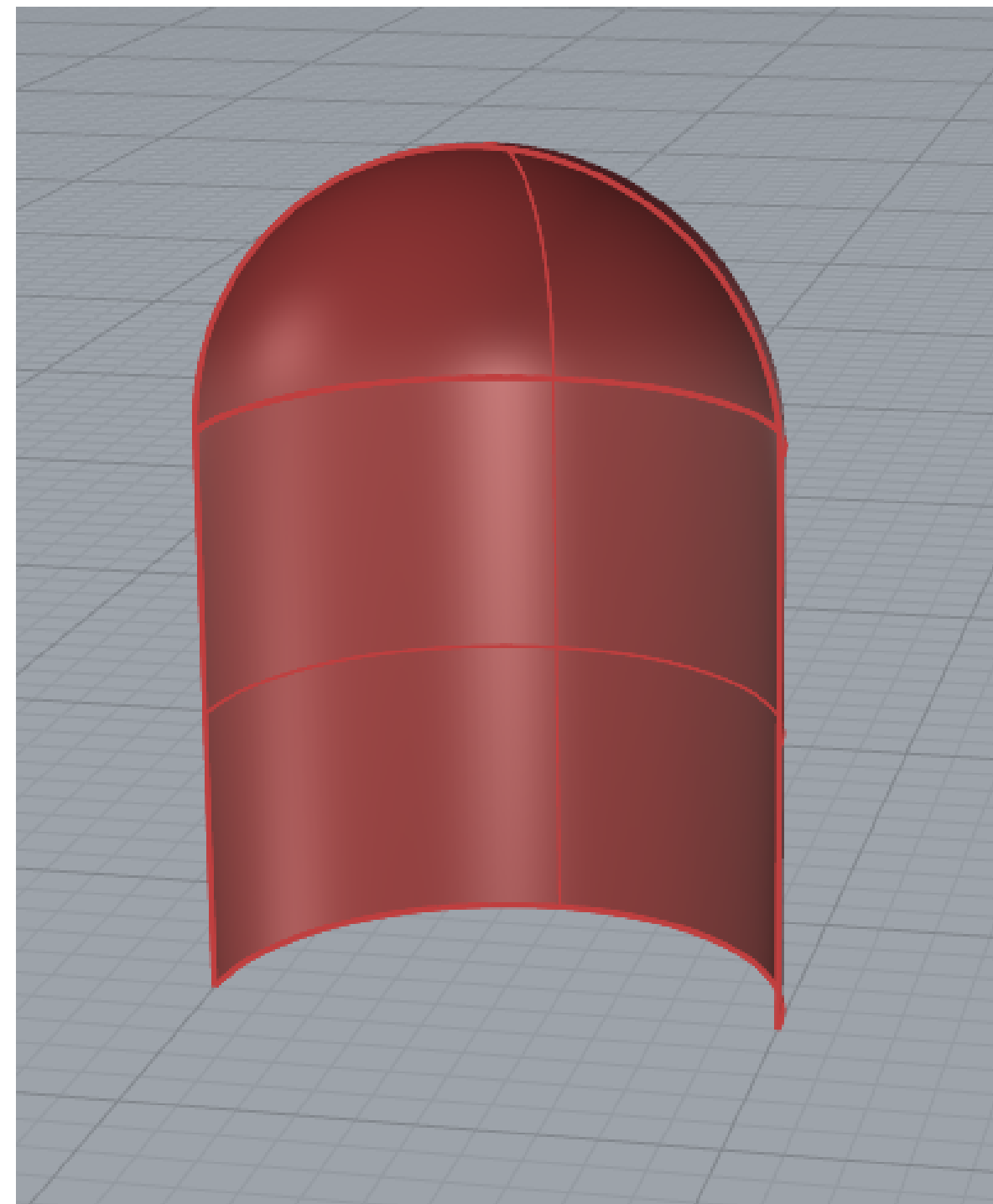
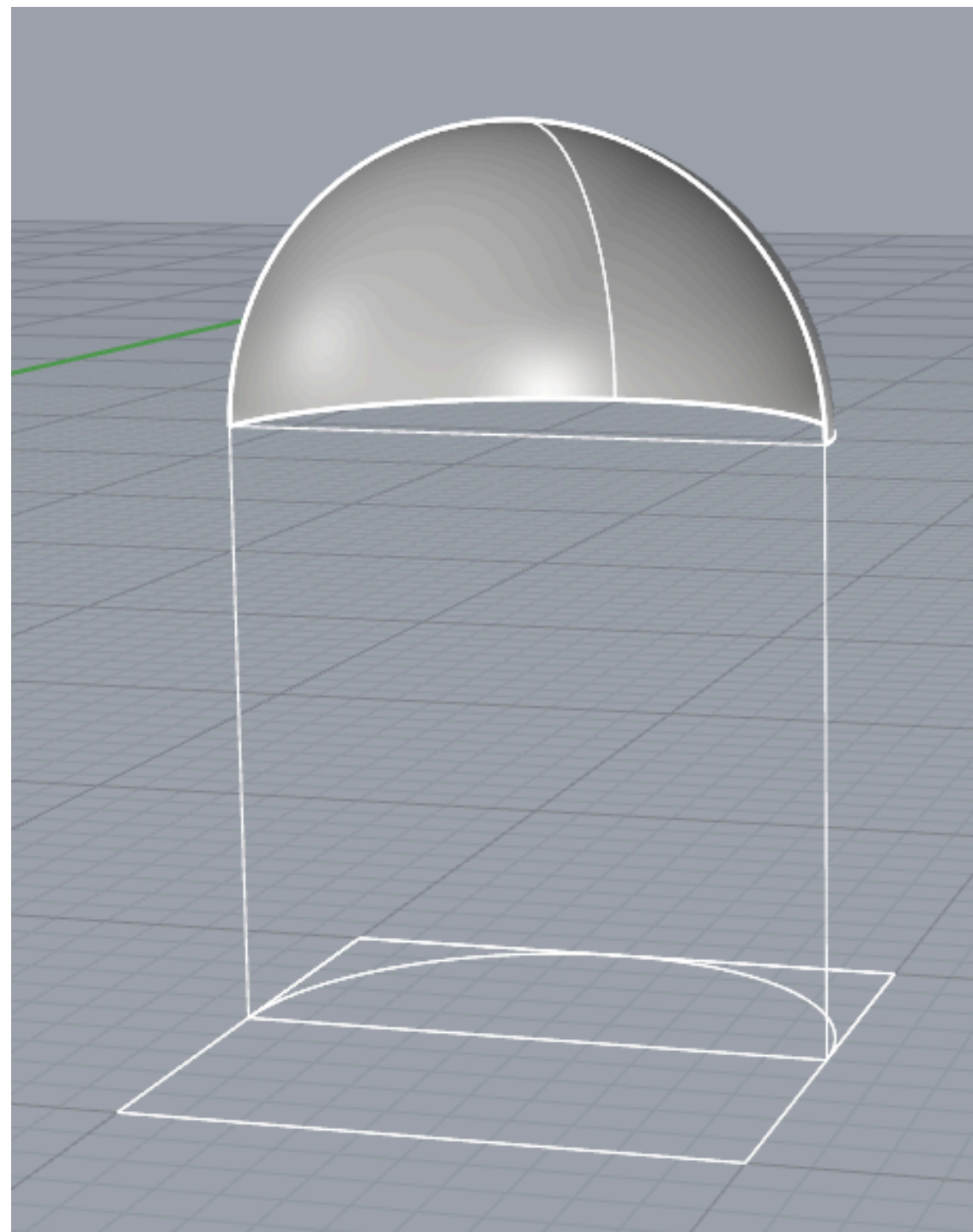
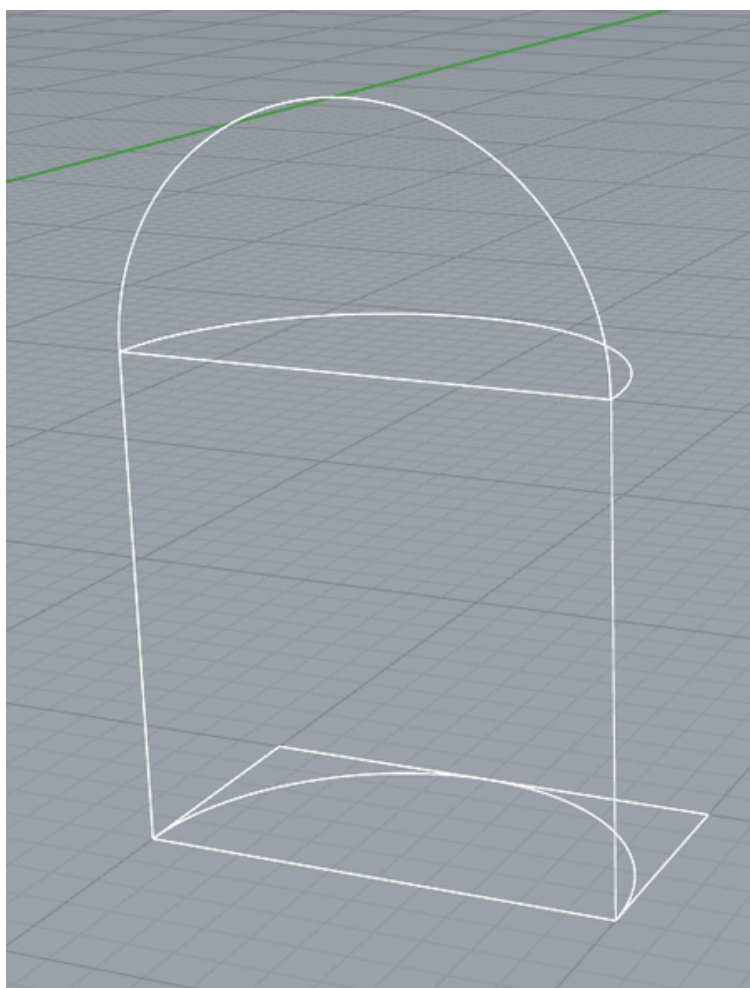
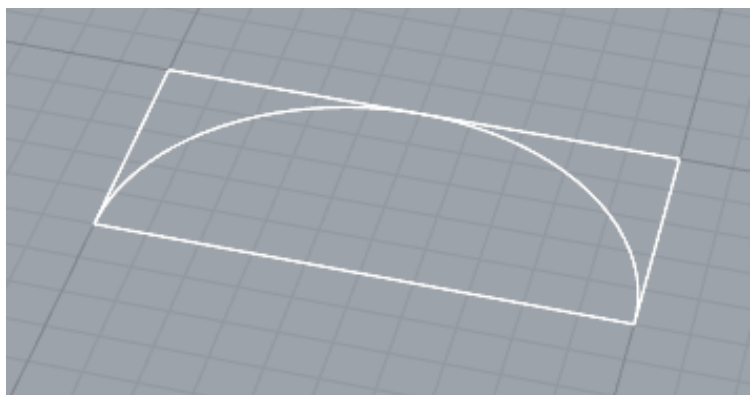


Copiar base do anterior



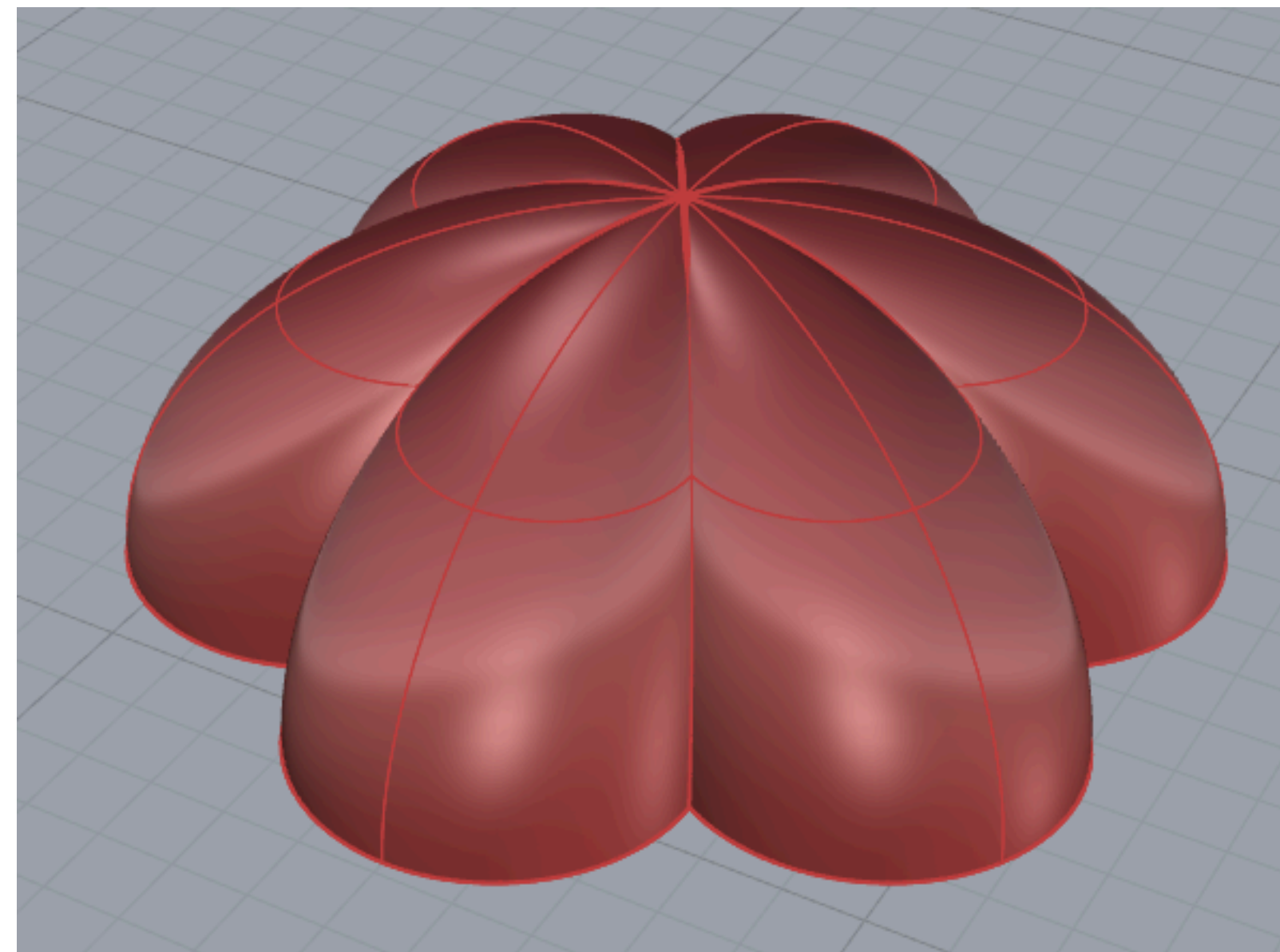
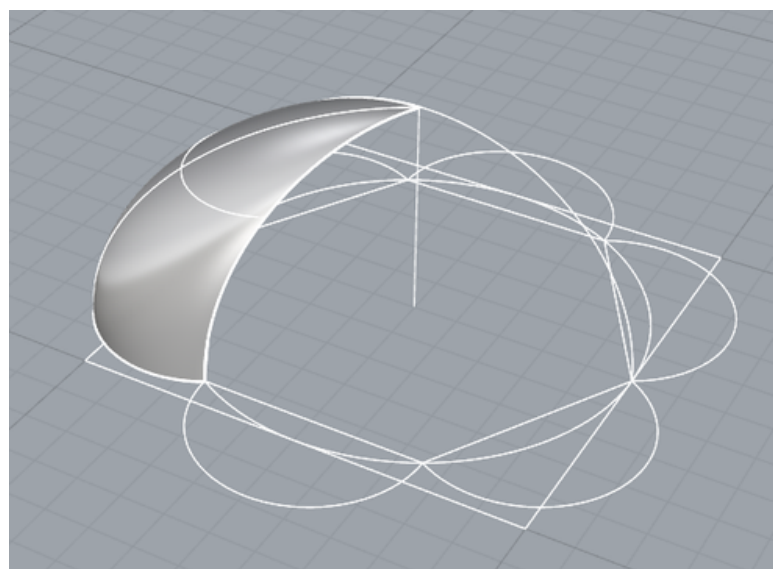
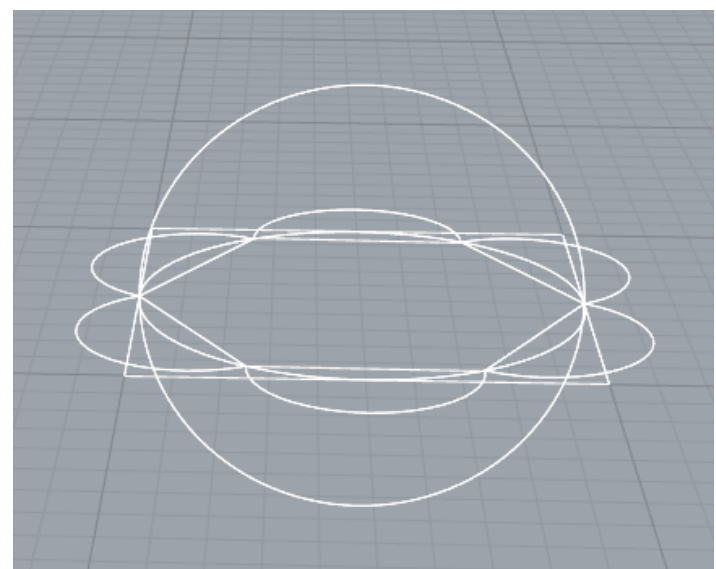
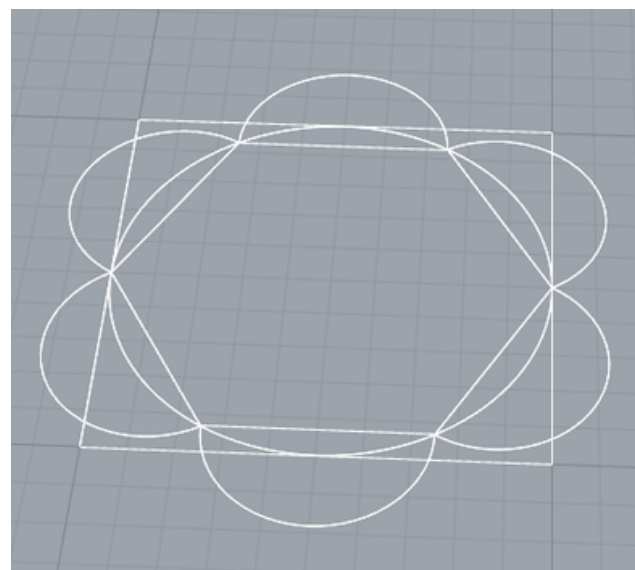
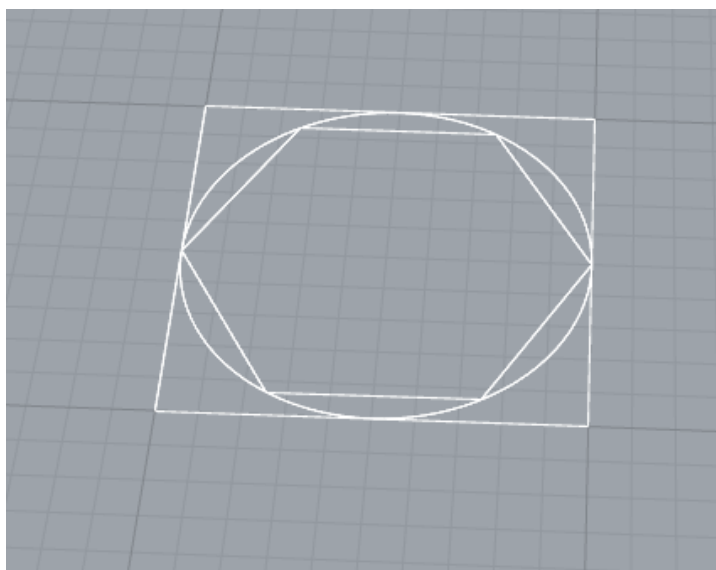
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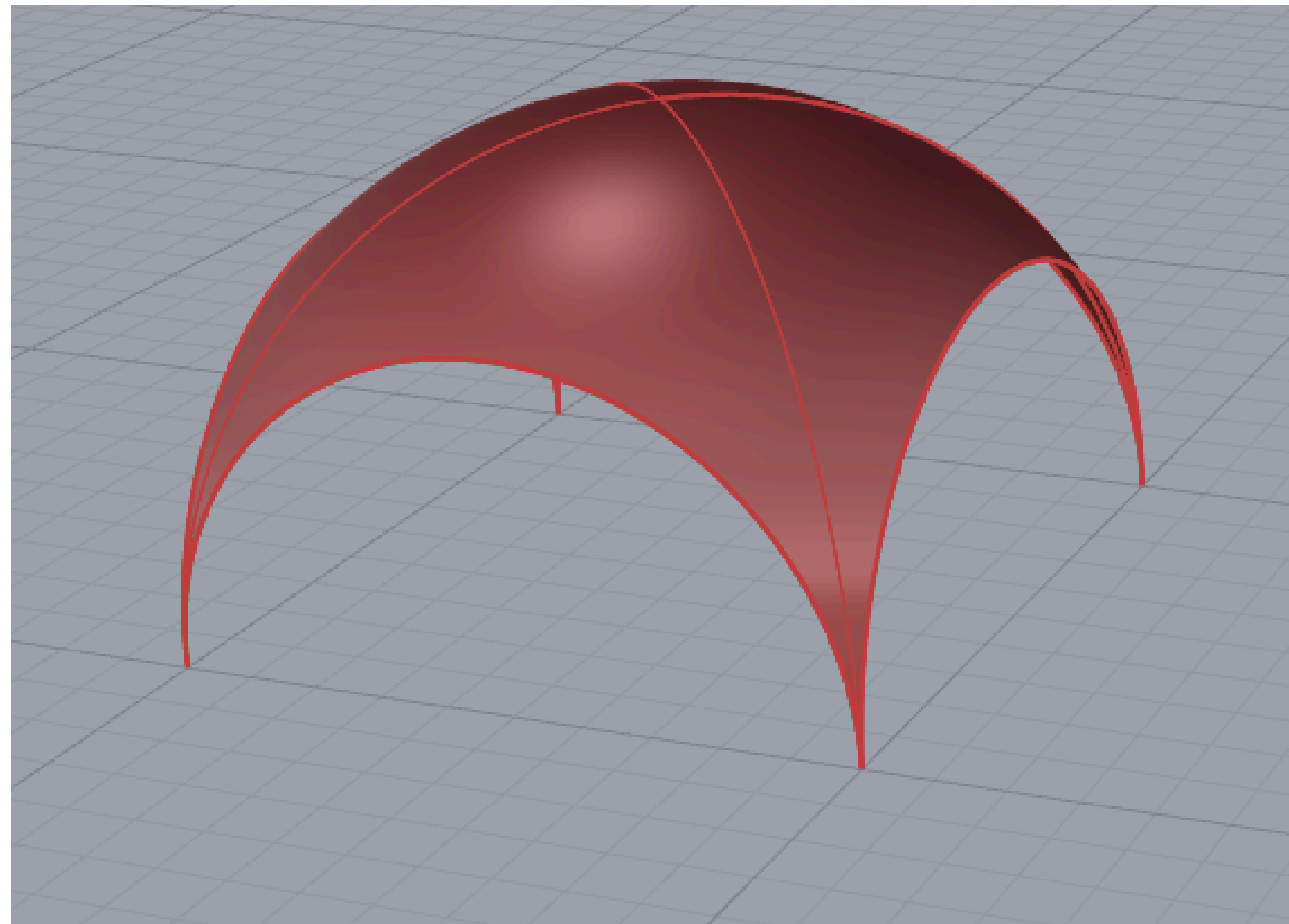
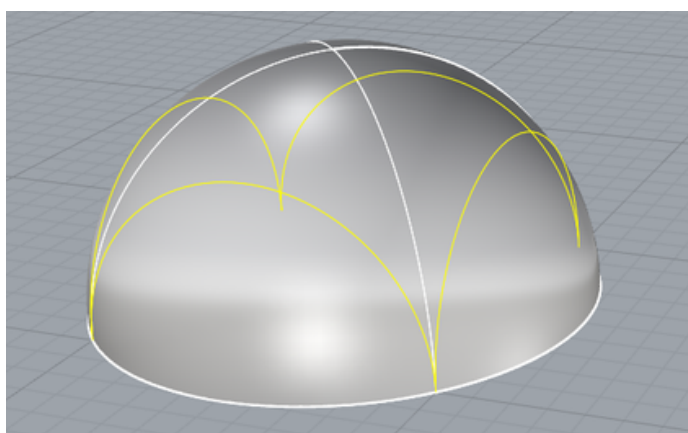
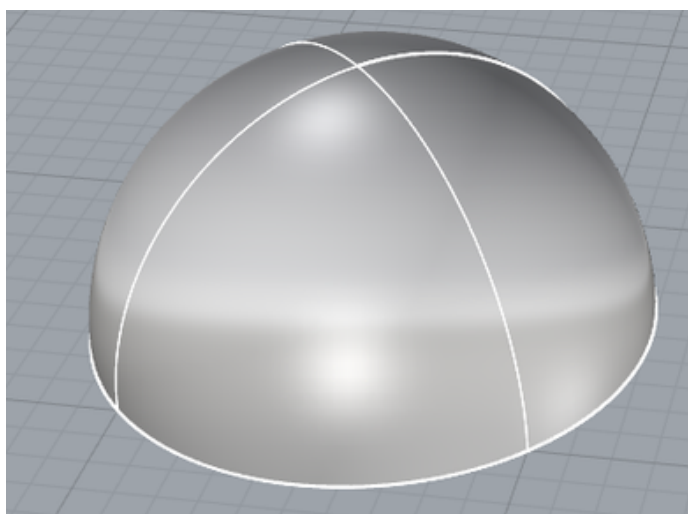
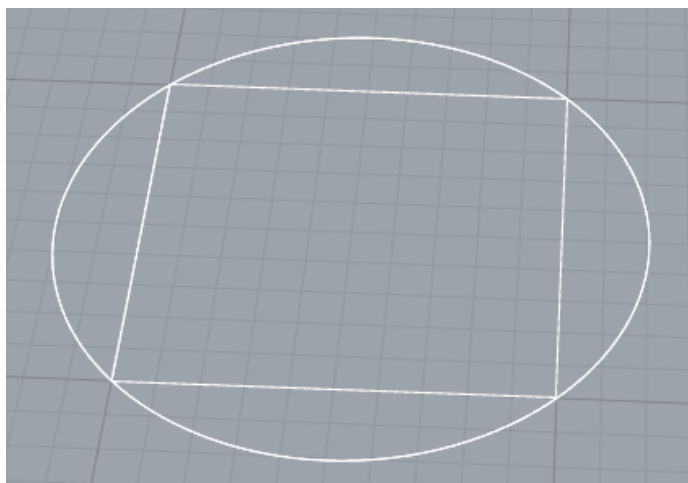
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Trabalho 2



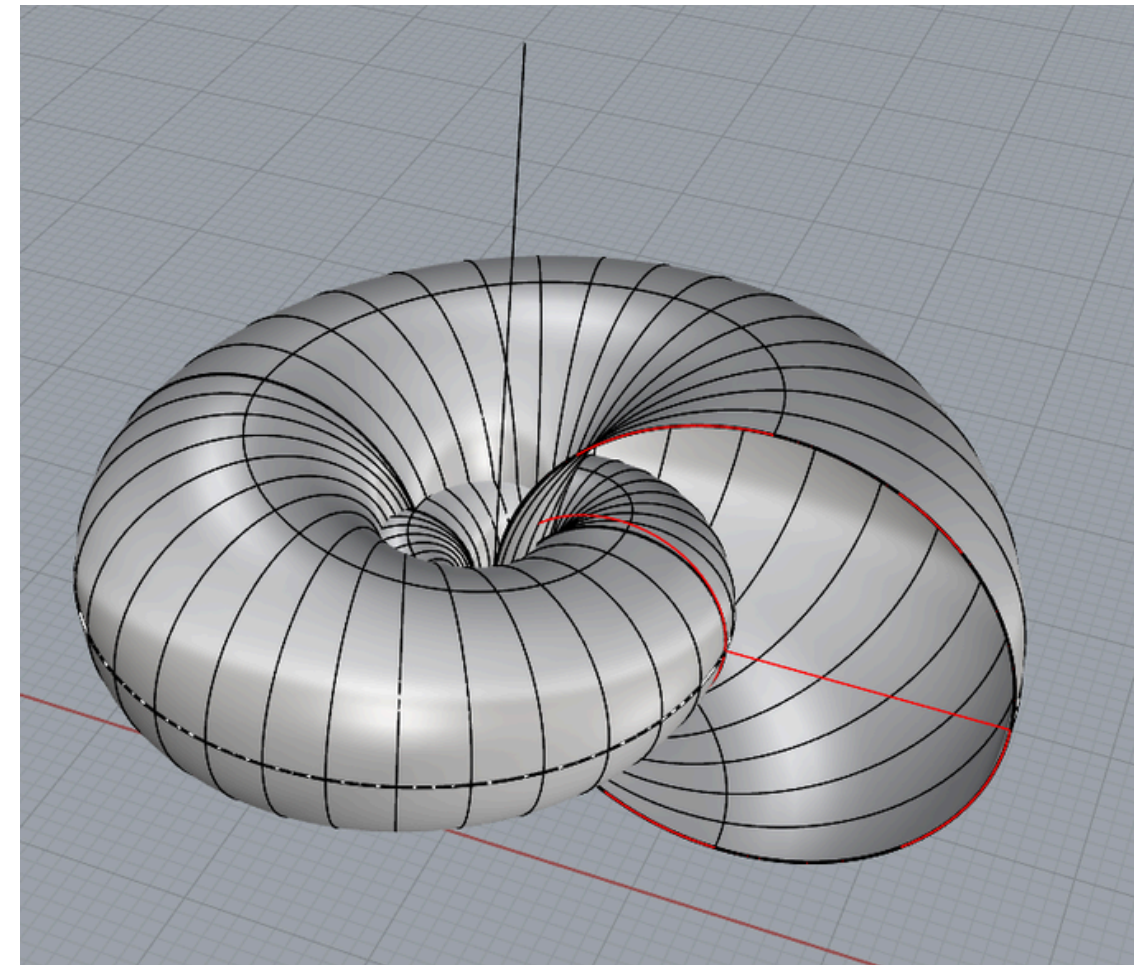
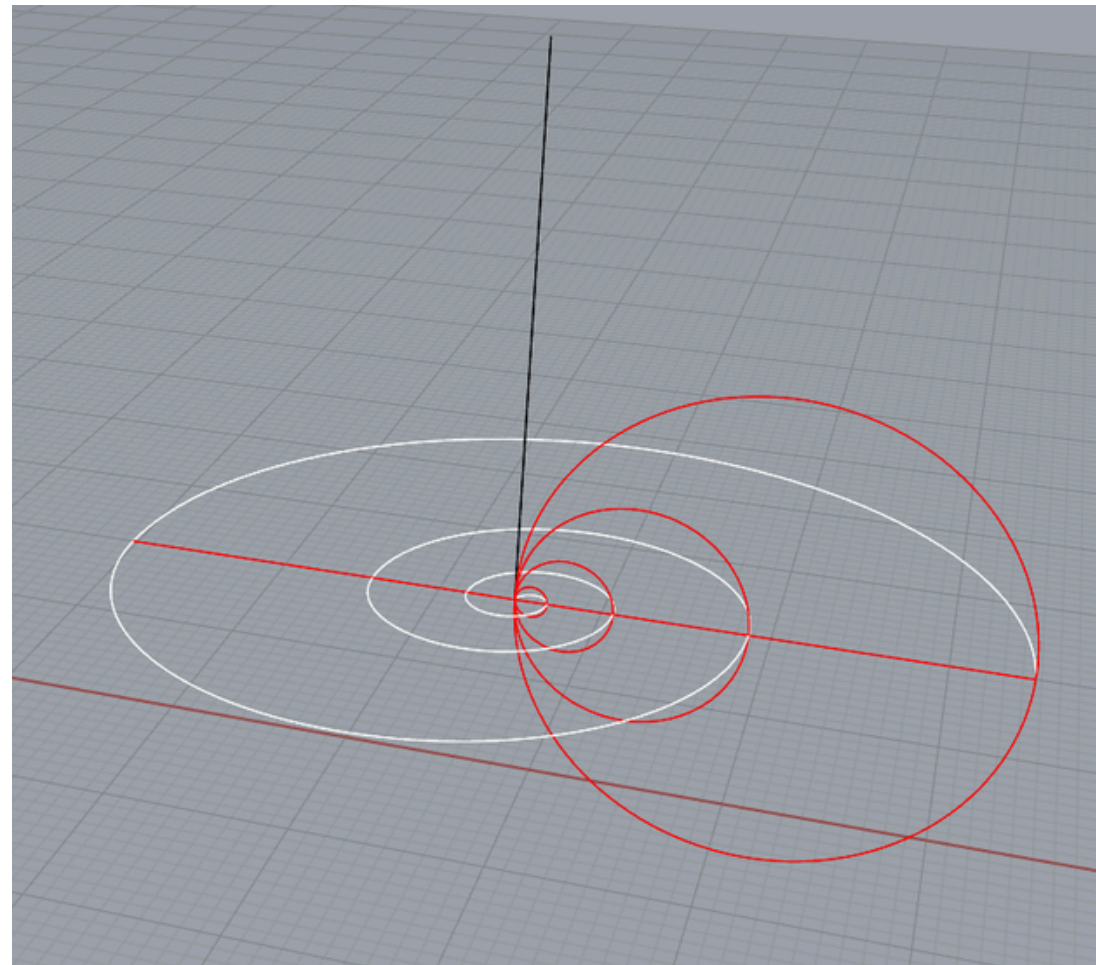
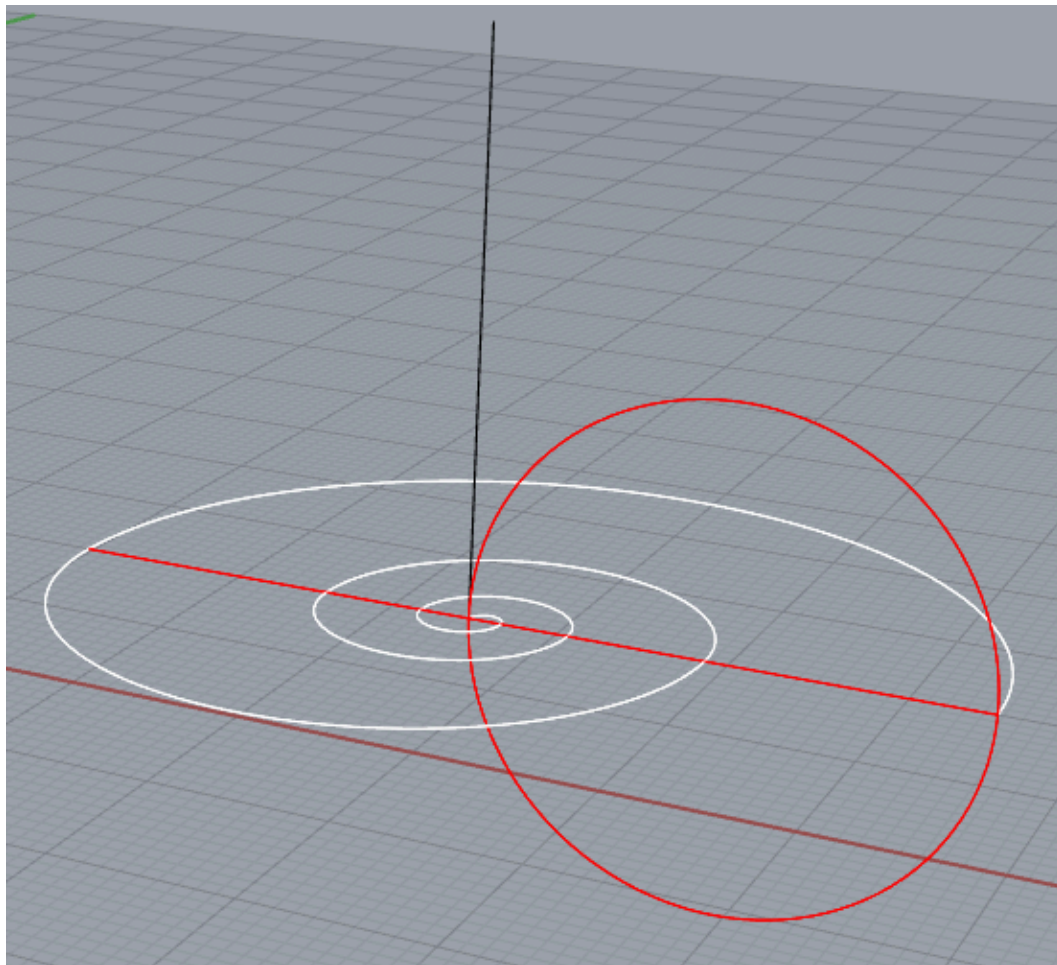
Abobada Alveolada

Trabalho 2

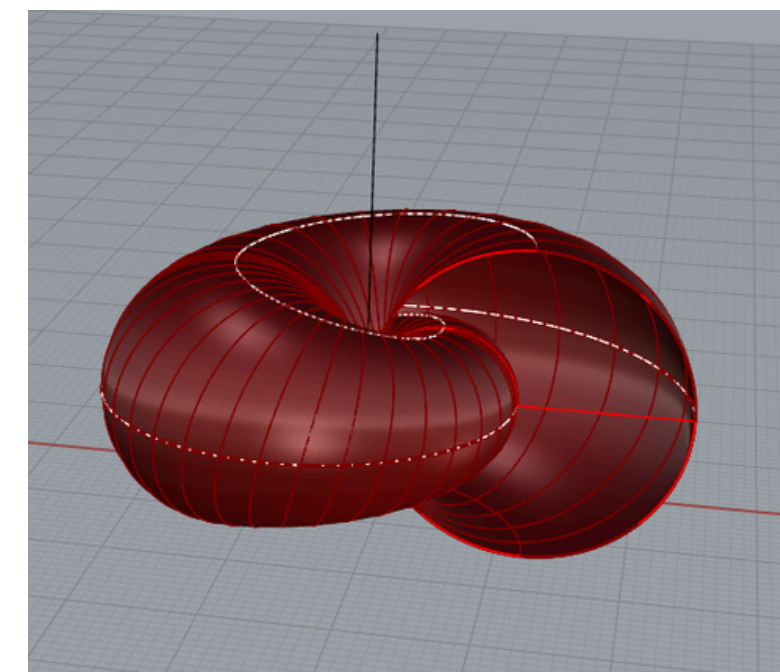
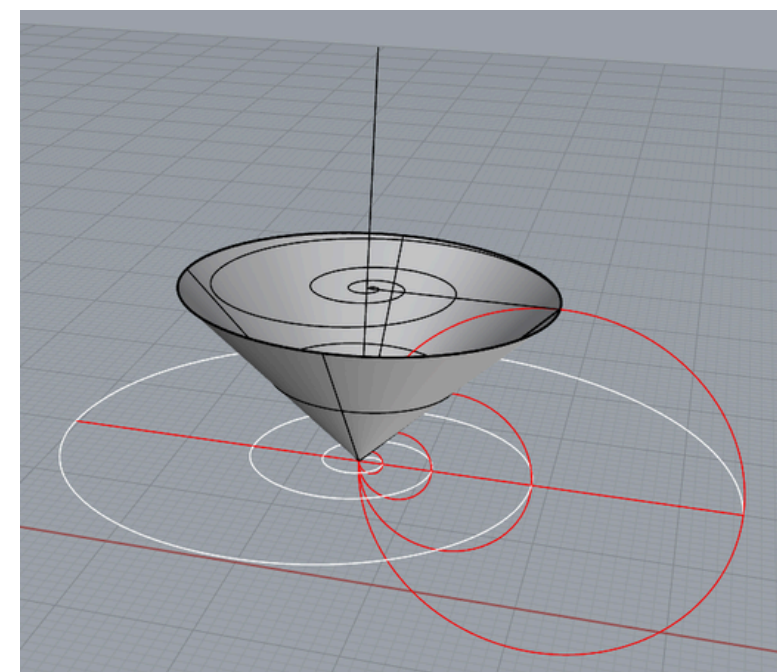
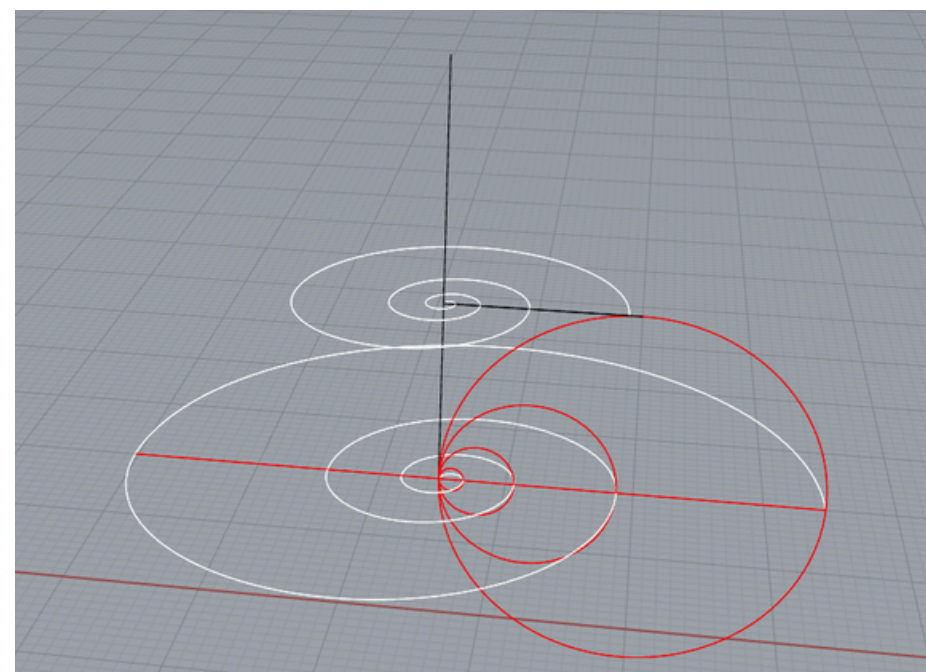
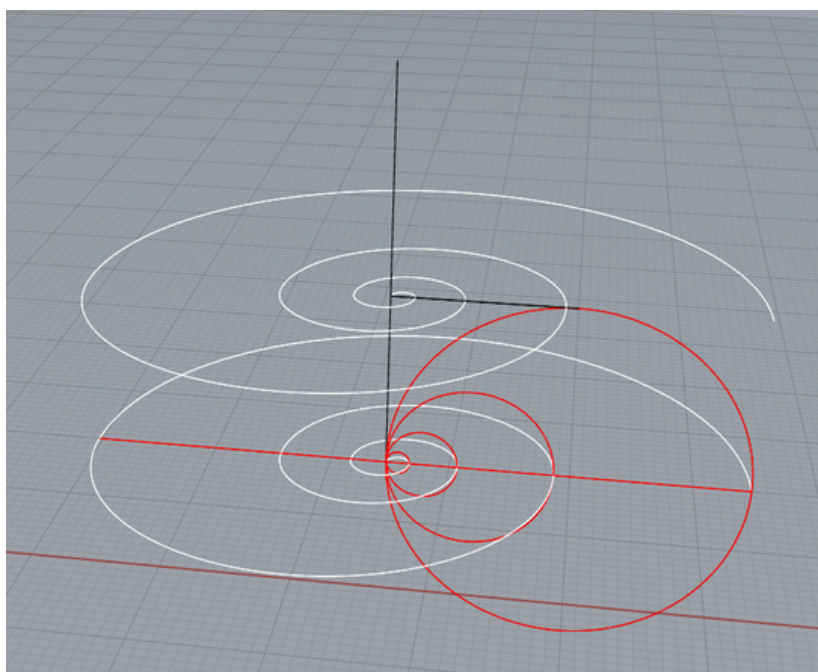


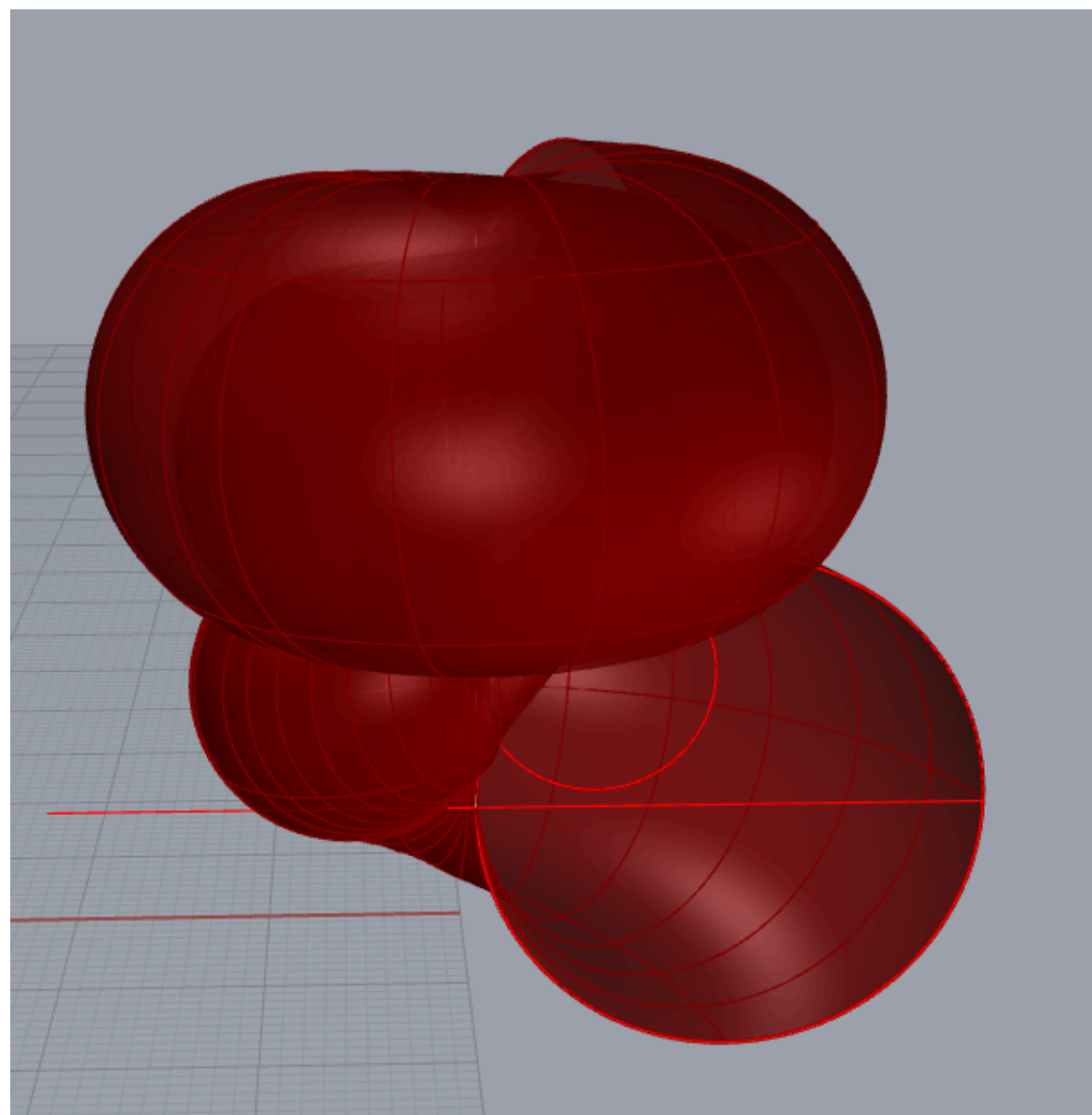
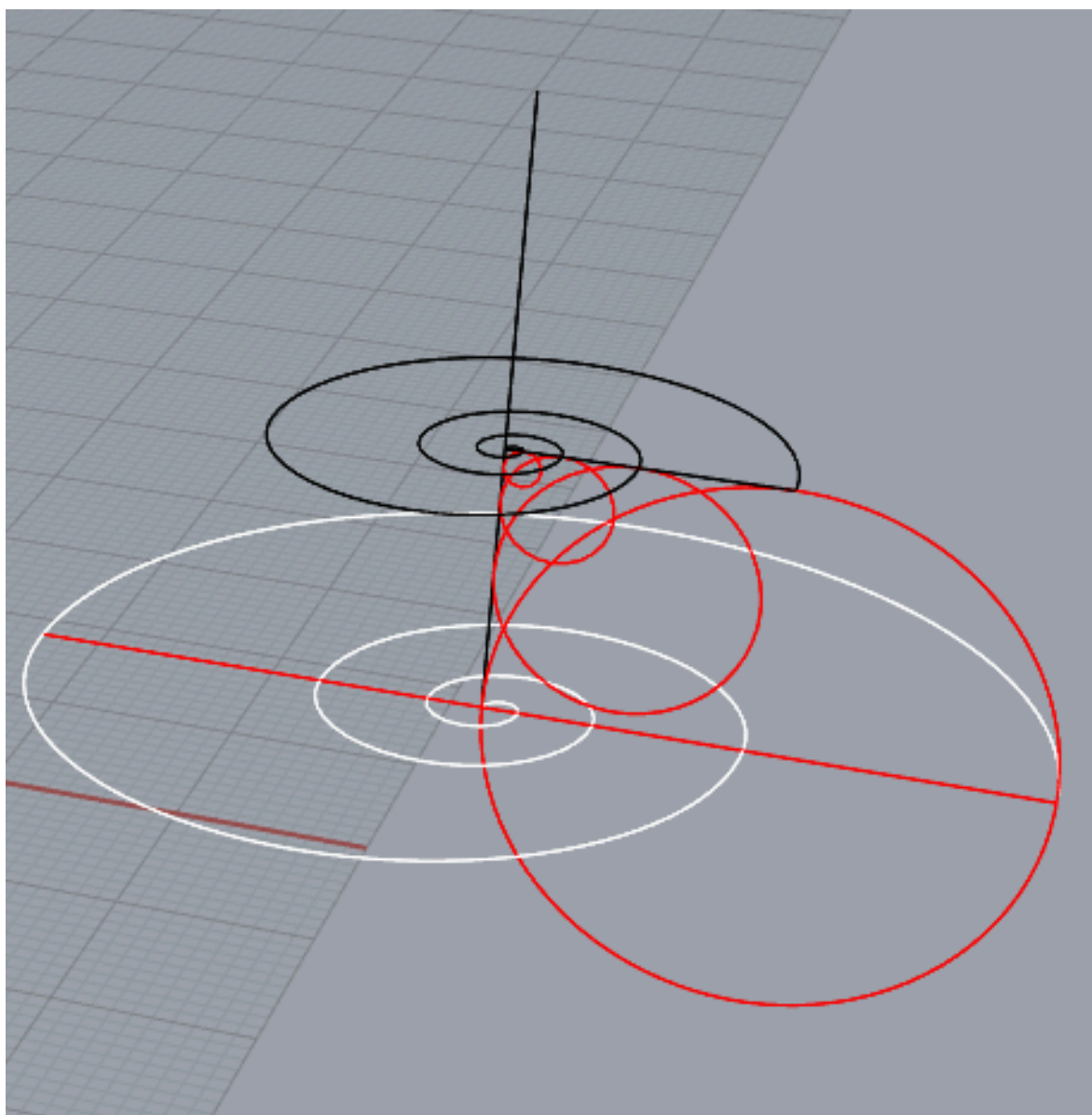
Abobada de Vela

Fim do Trabalho 2

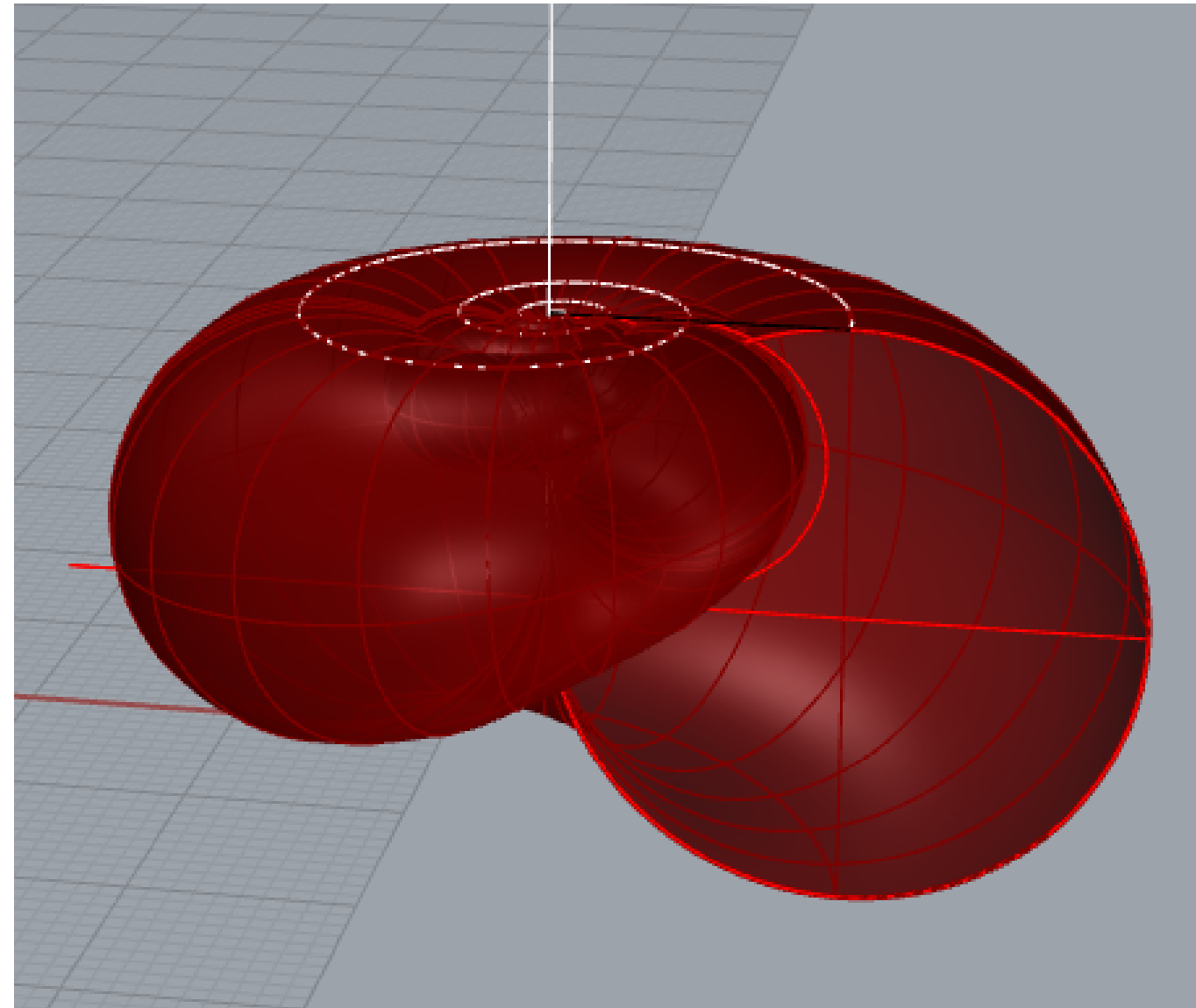


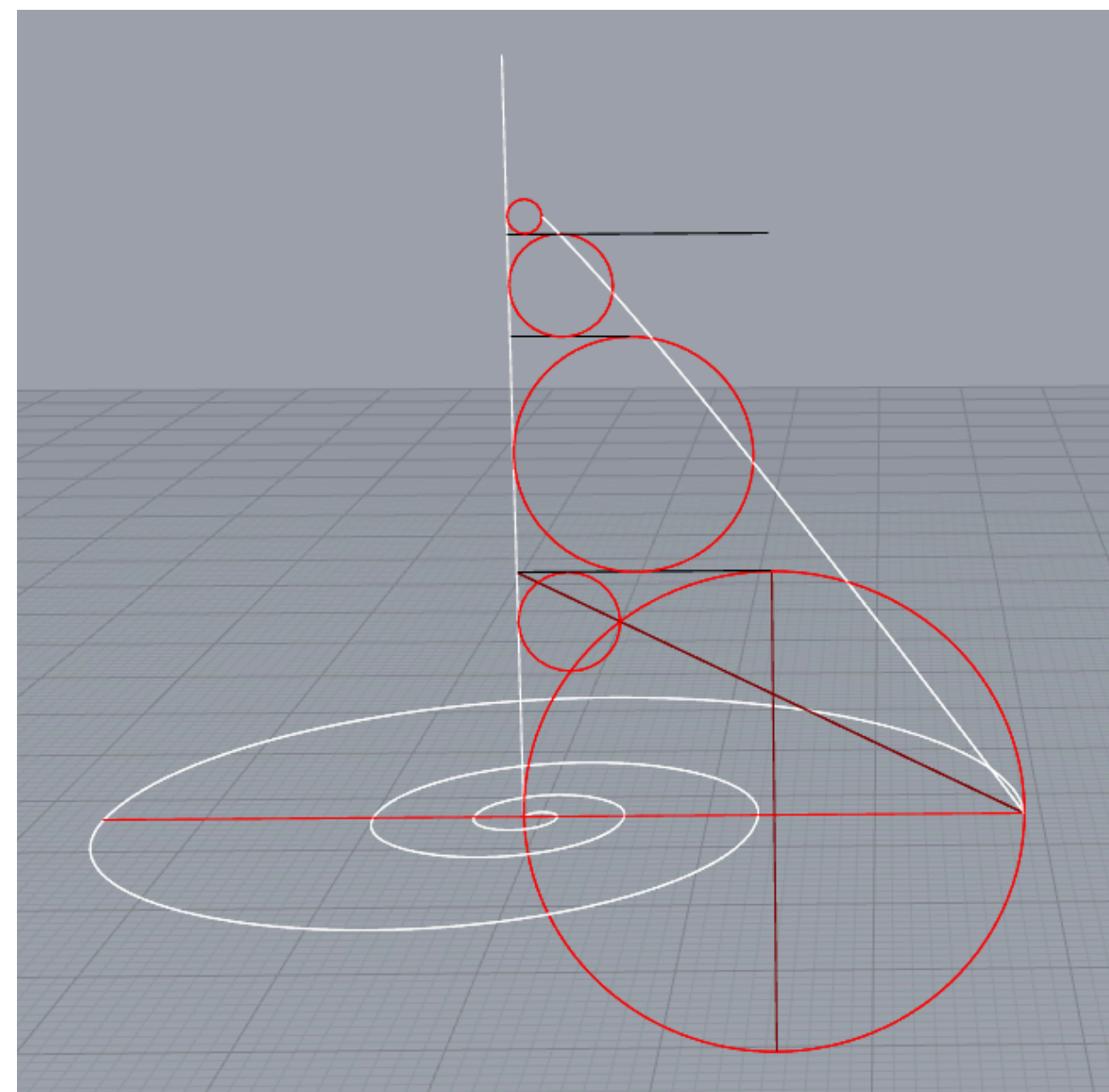
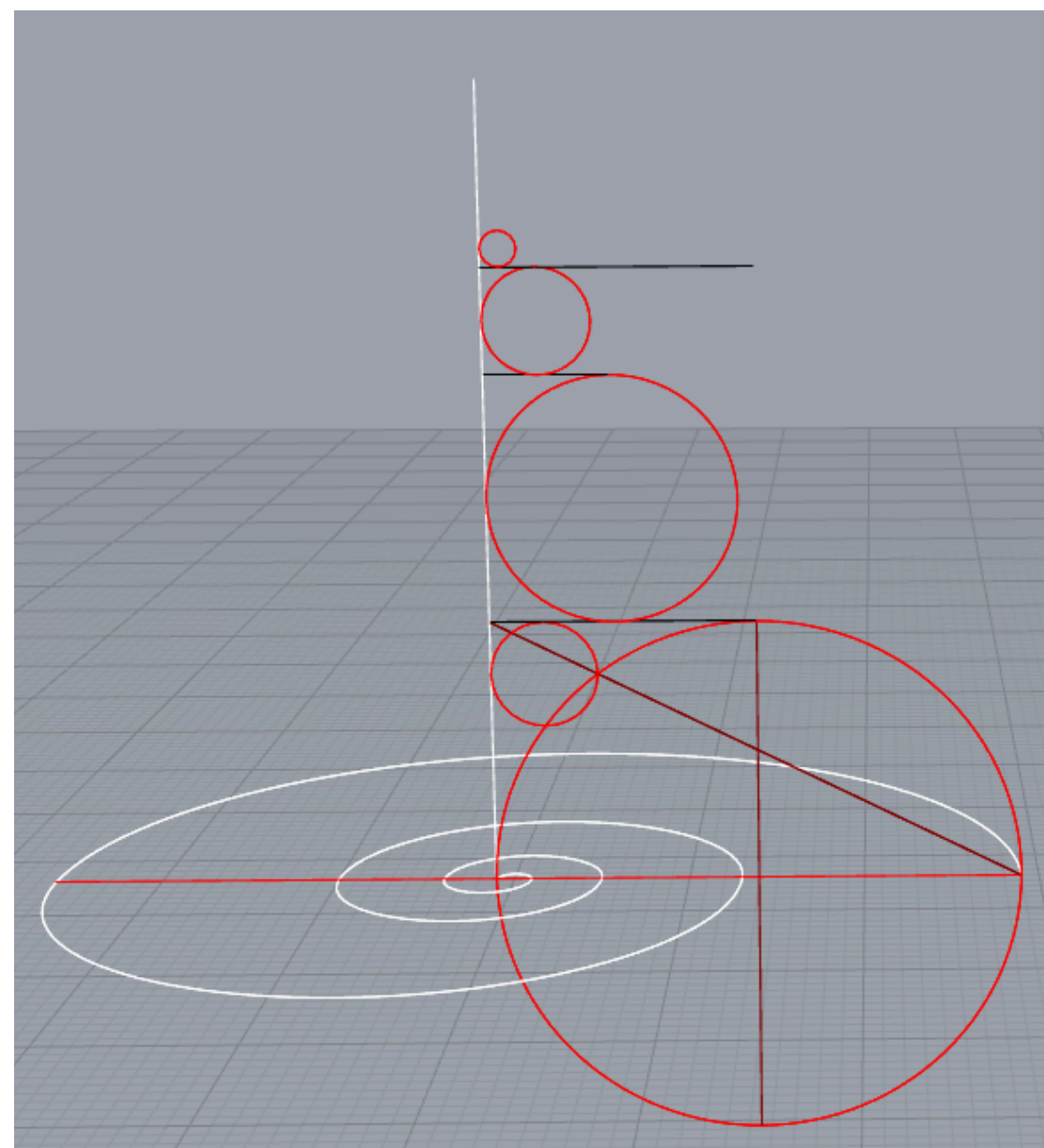
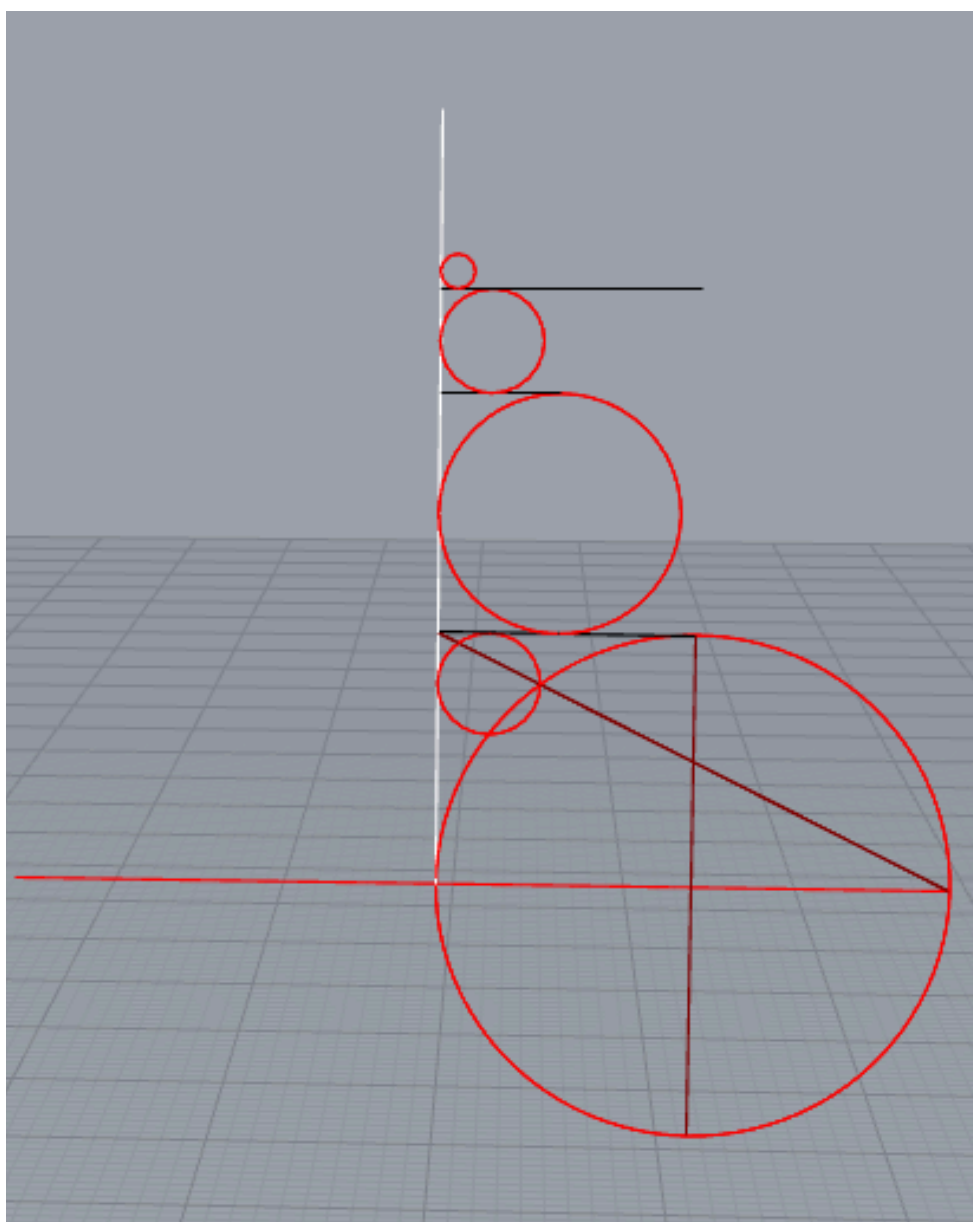
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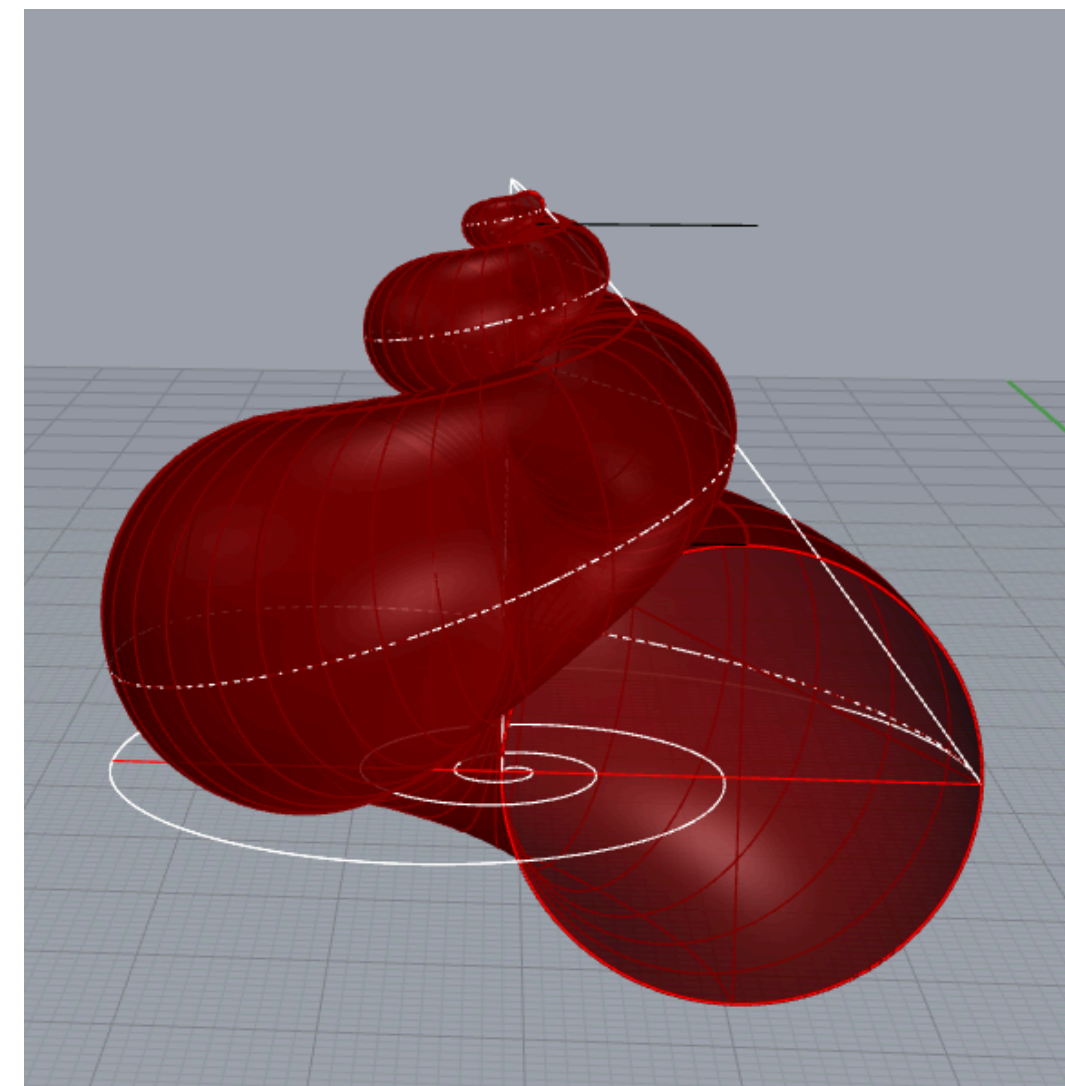
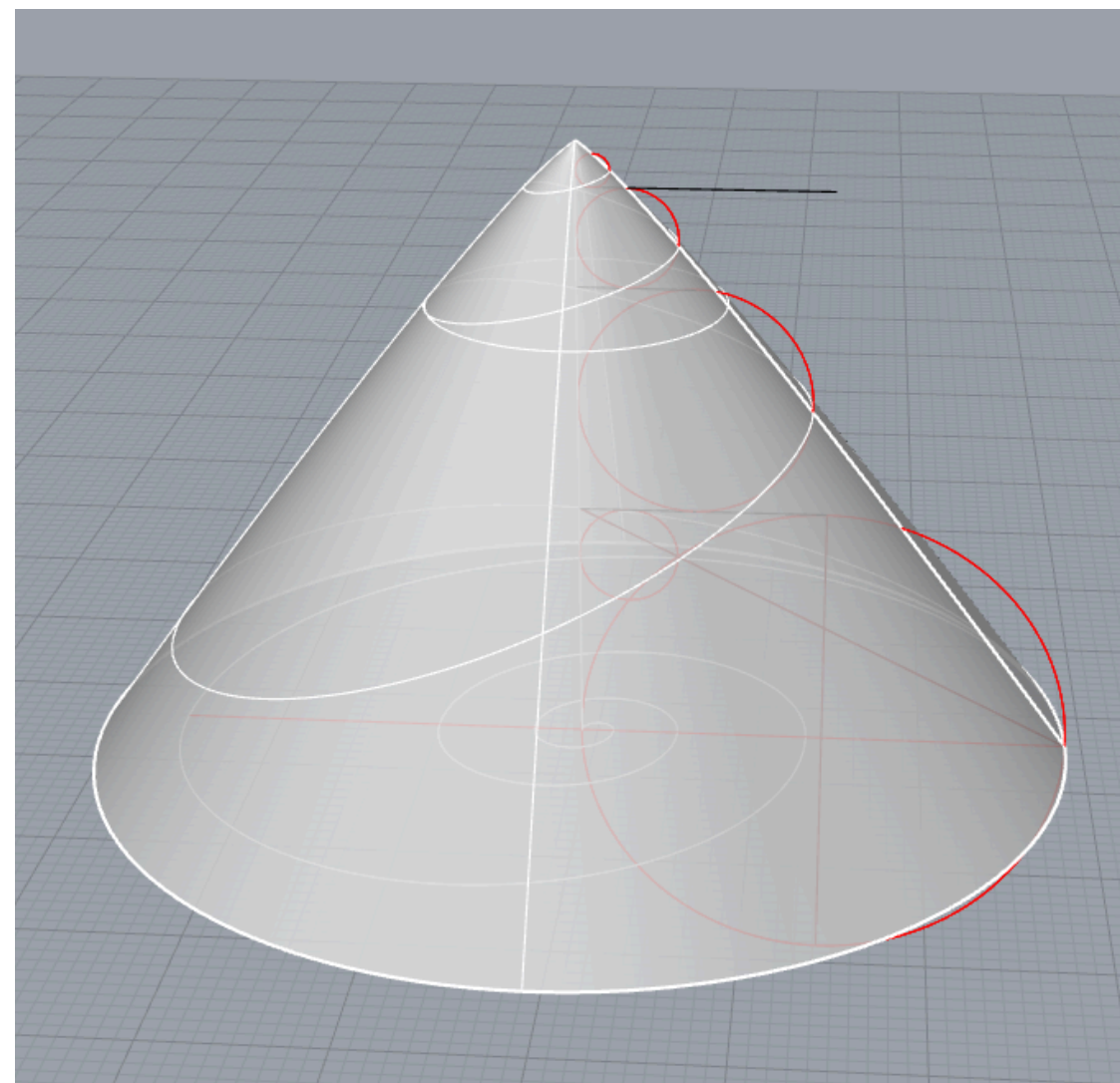
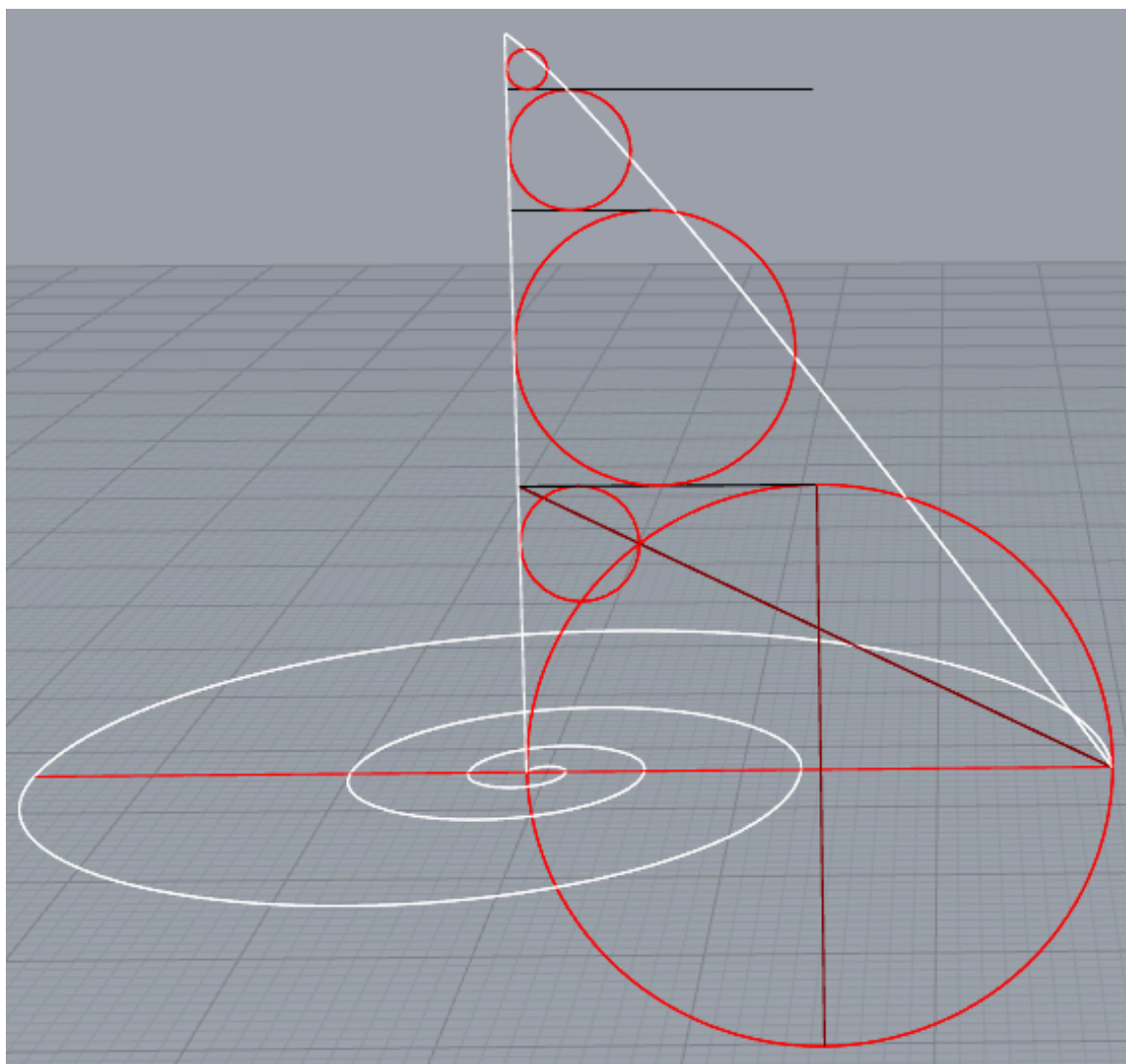


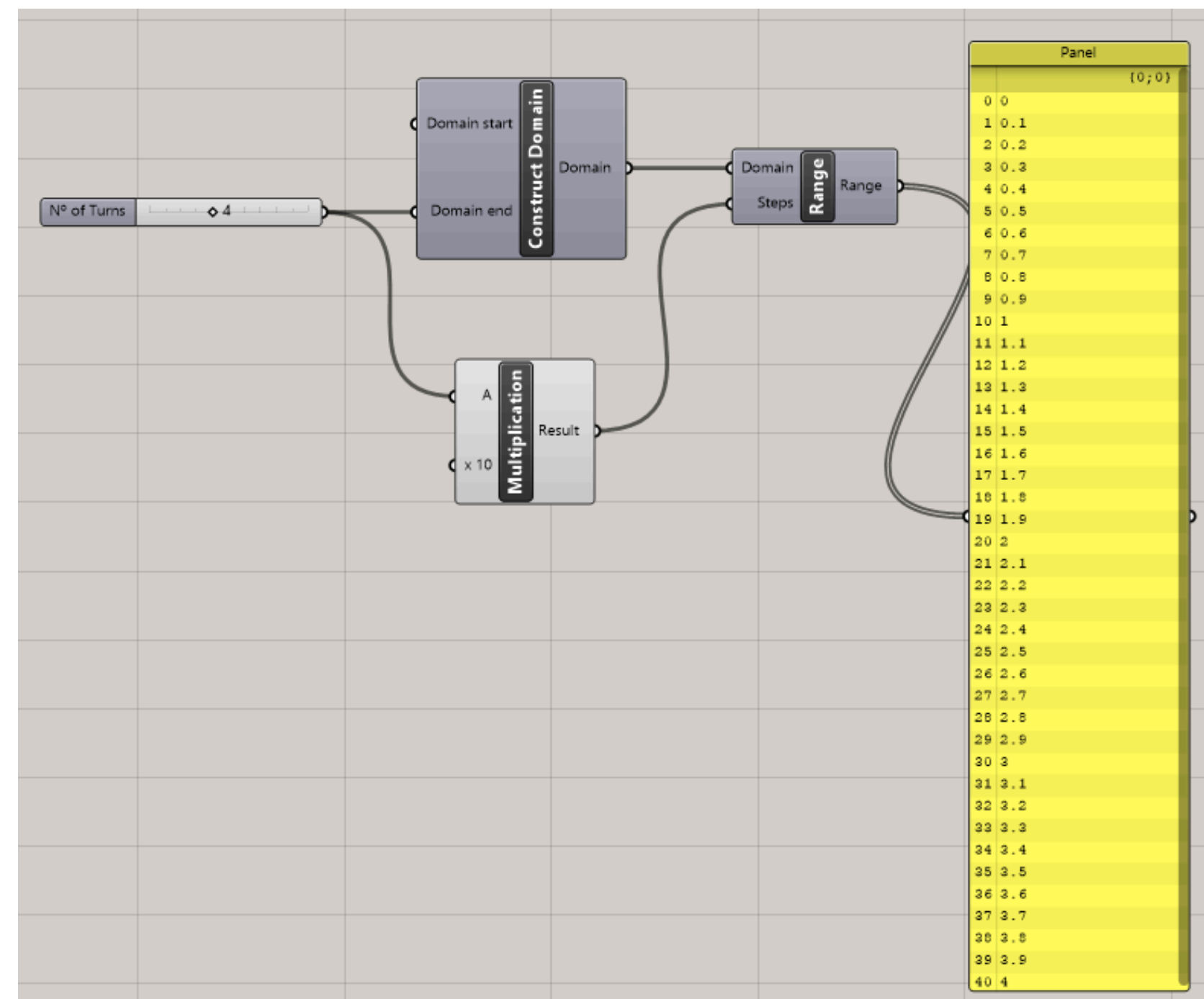
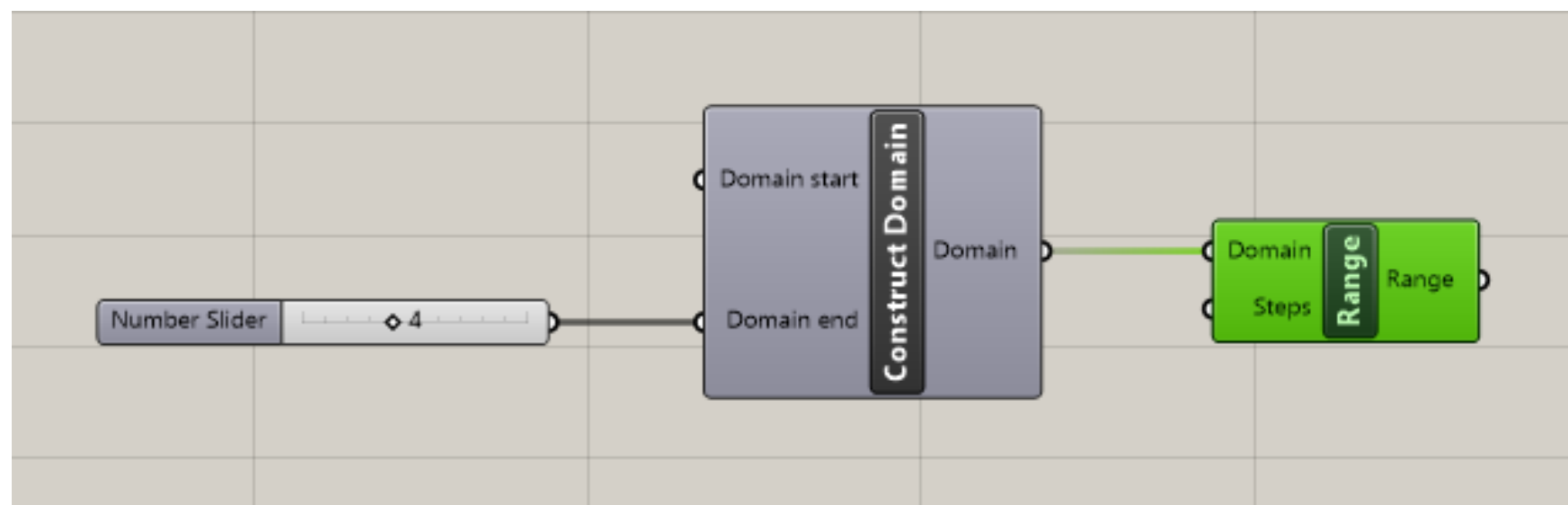


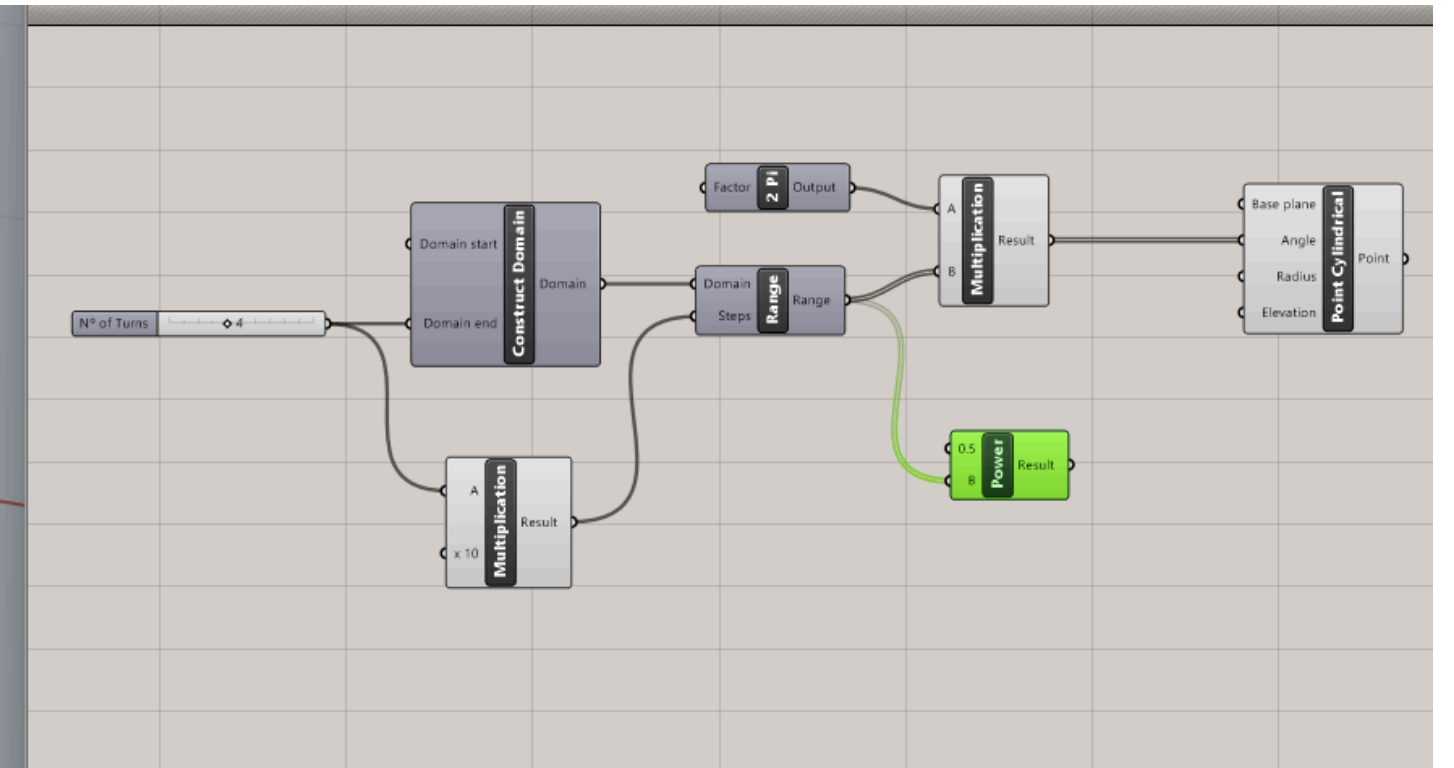
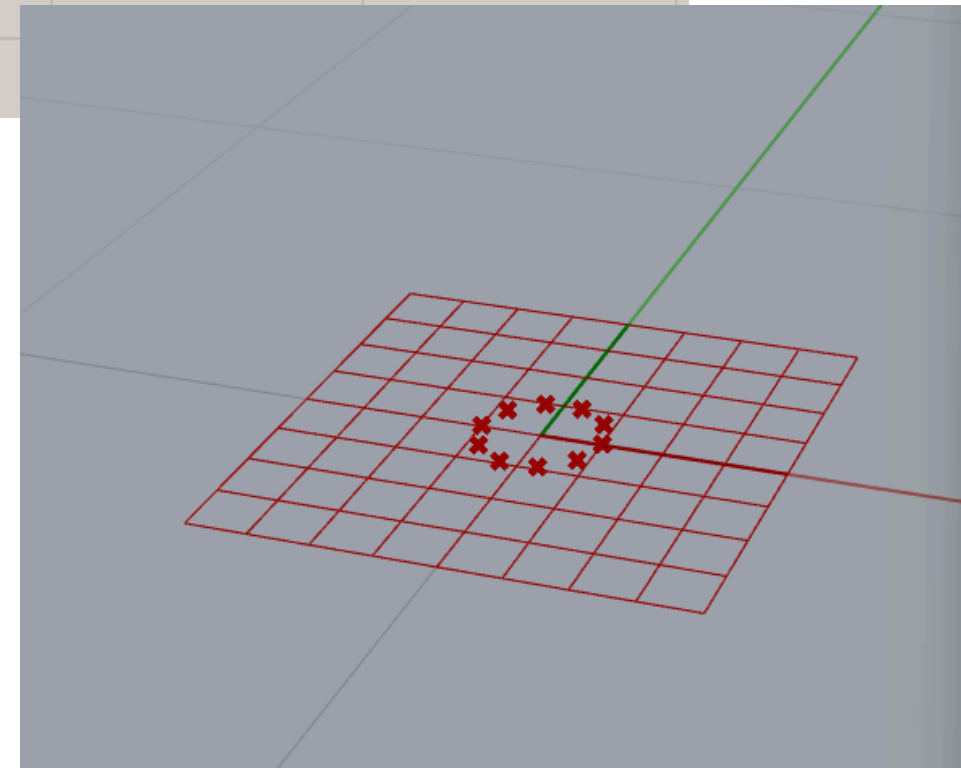
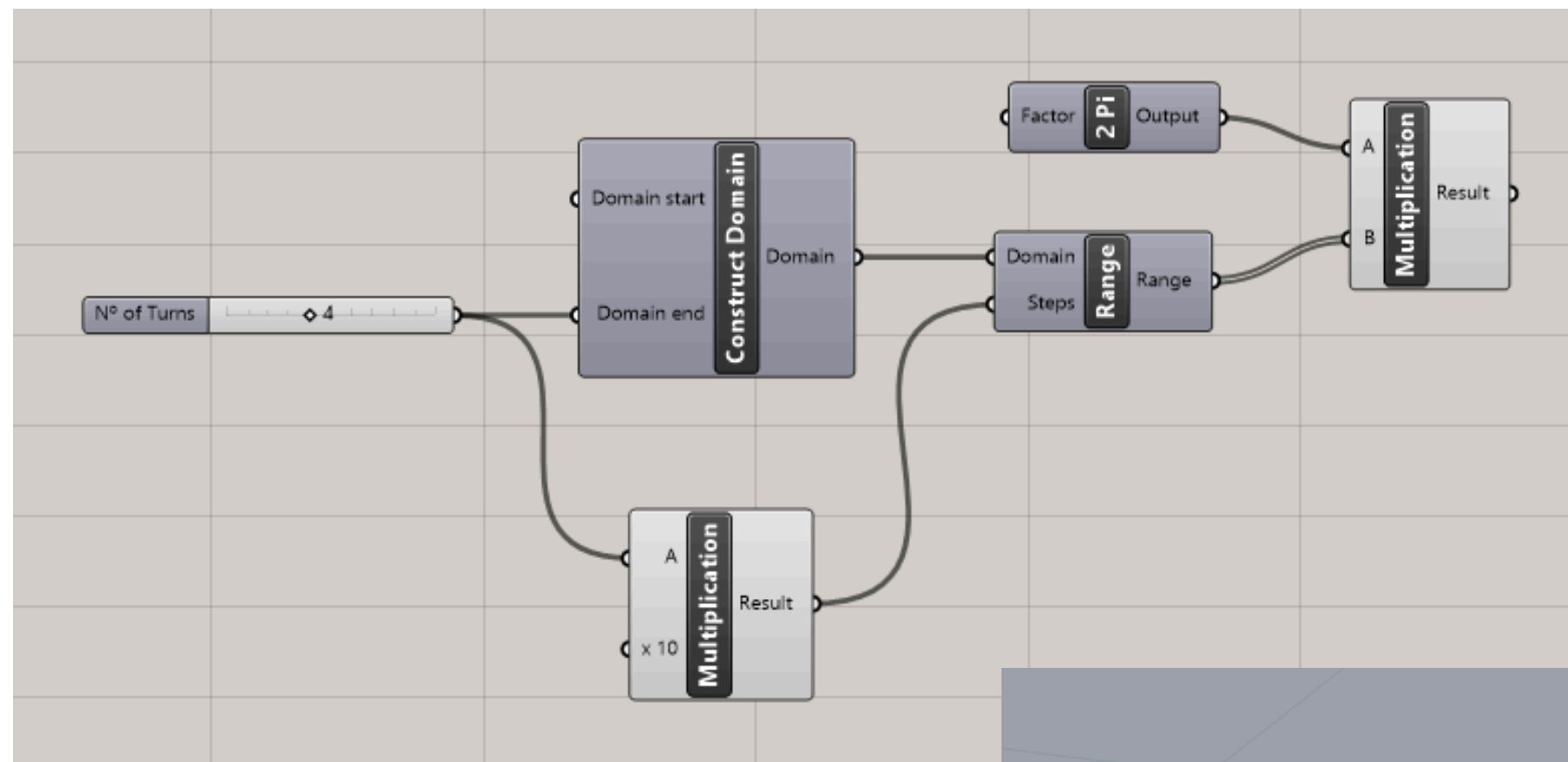
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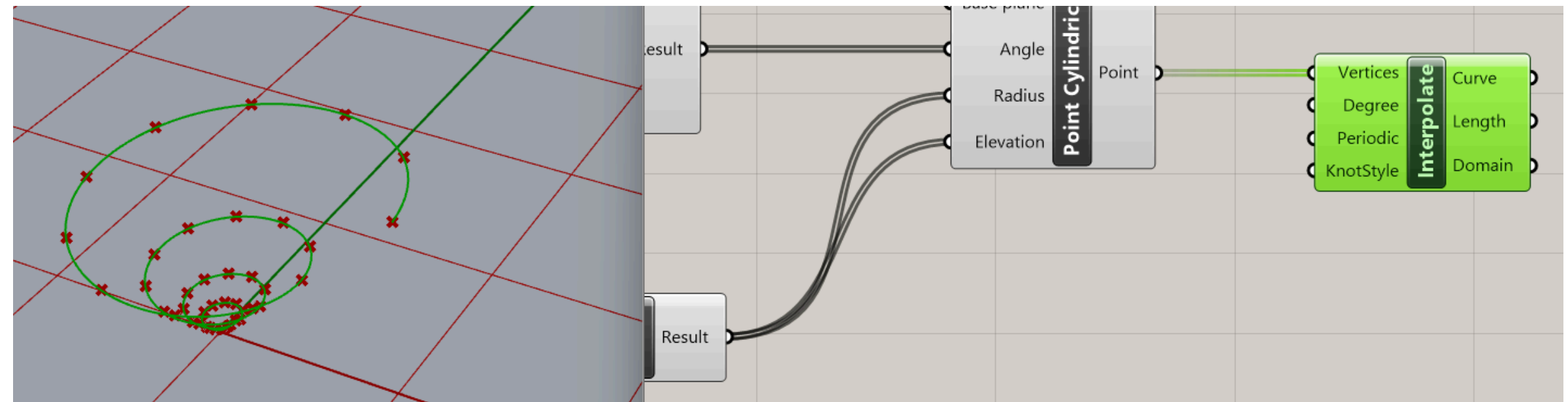
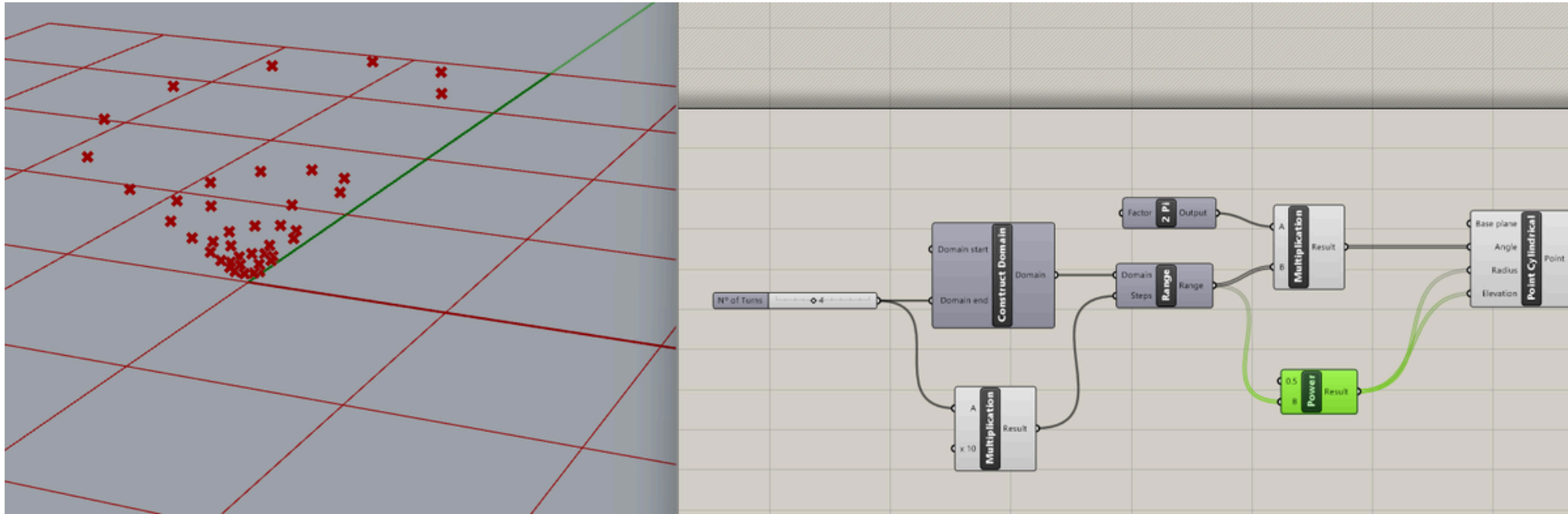


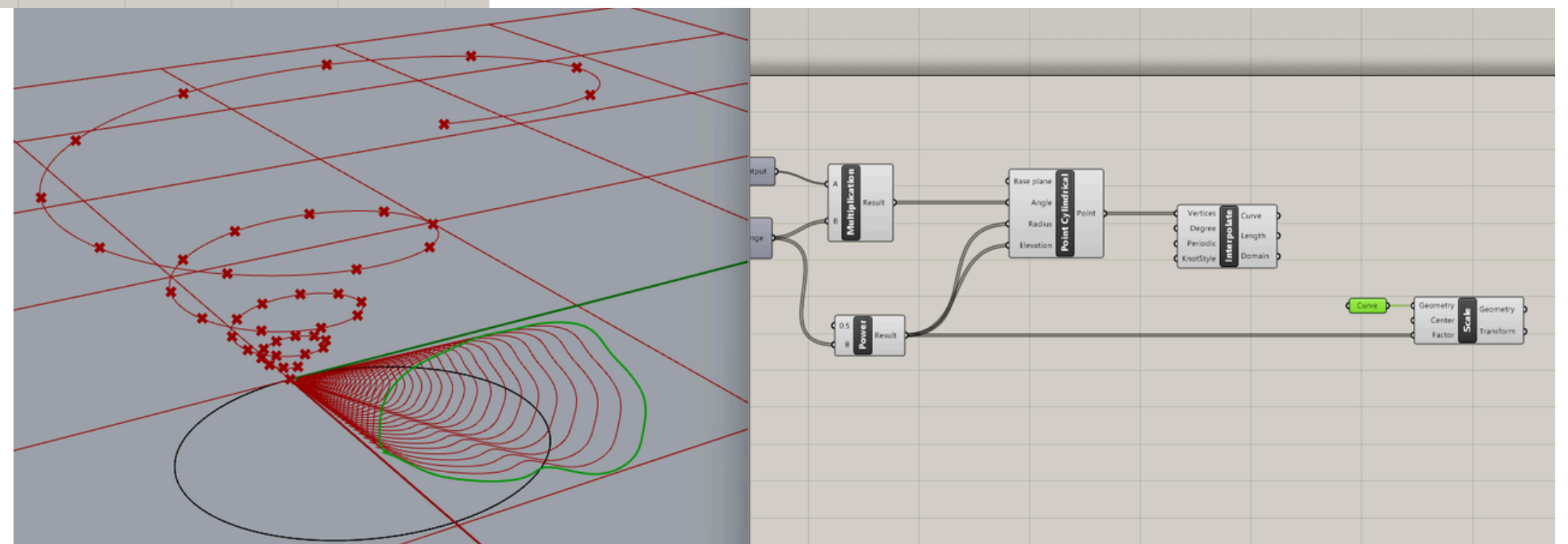
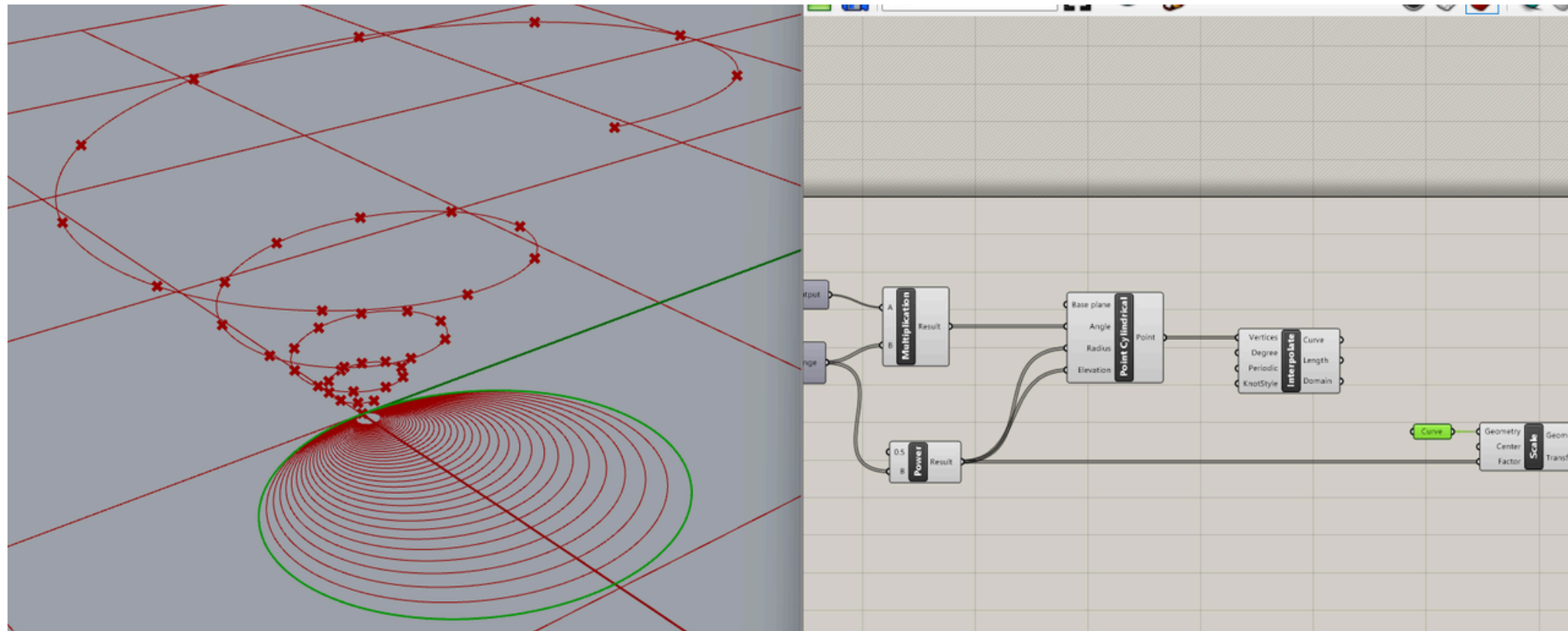


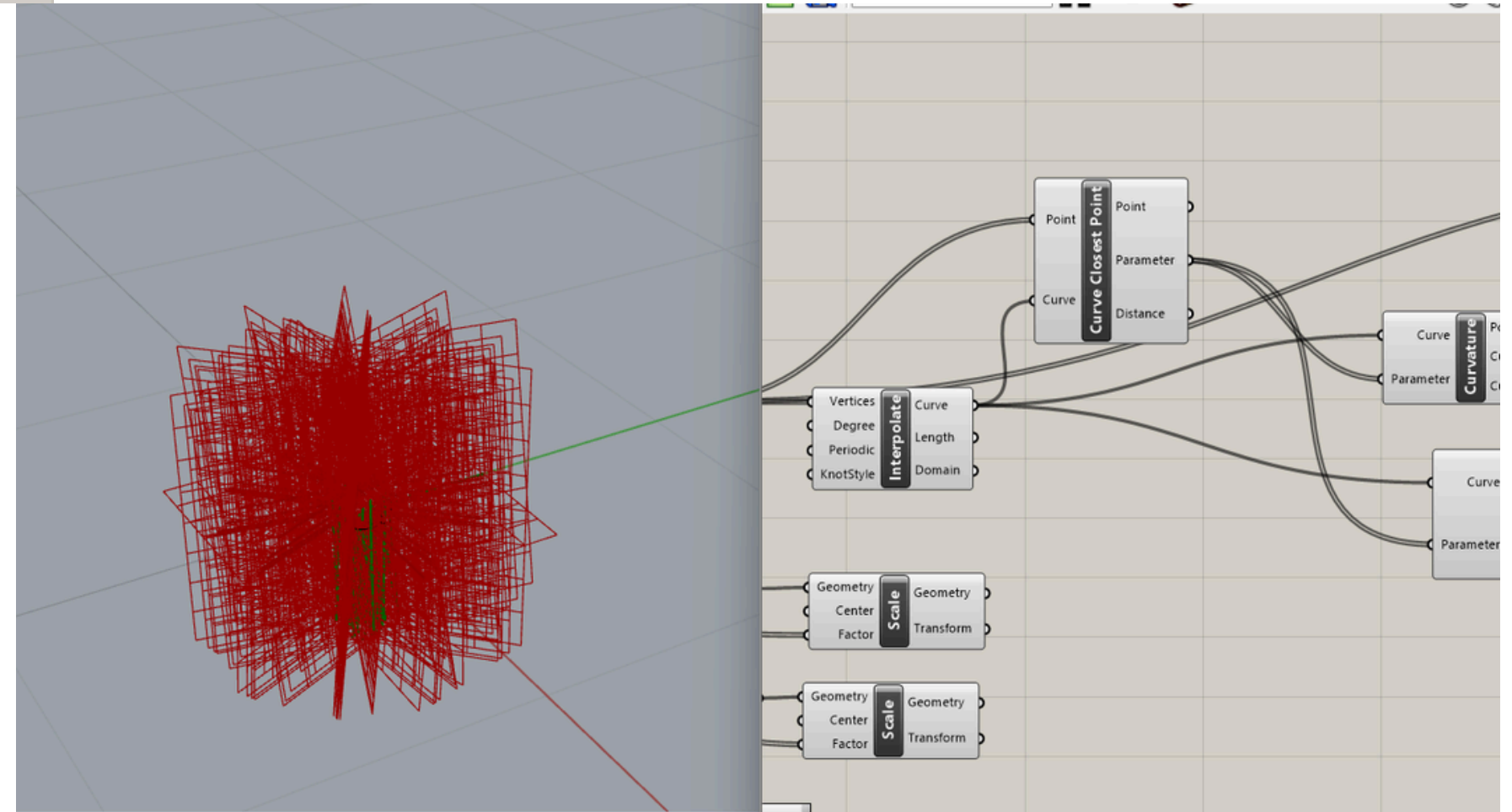
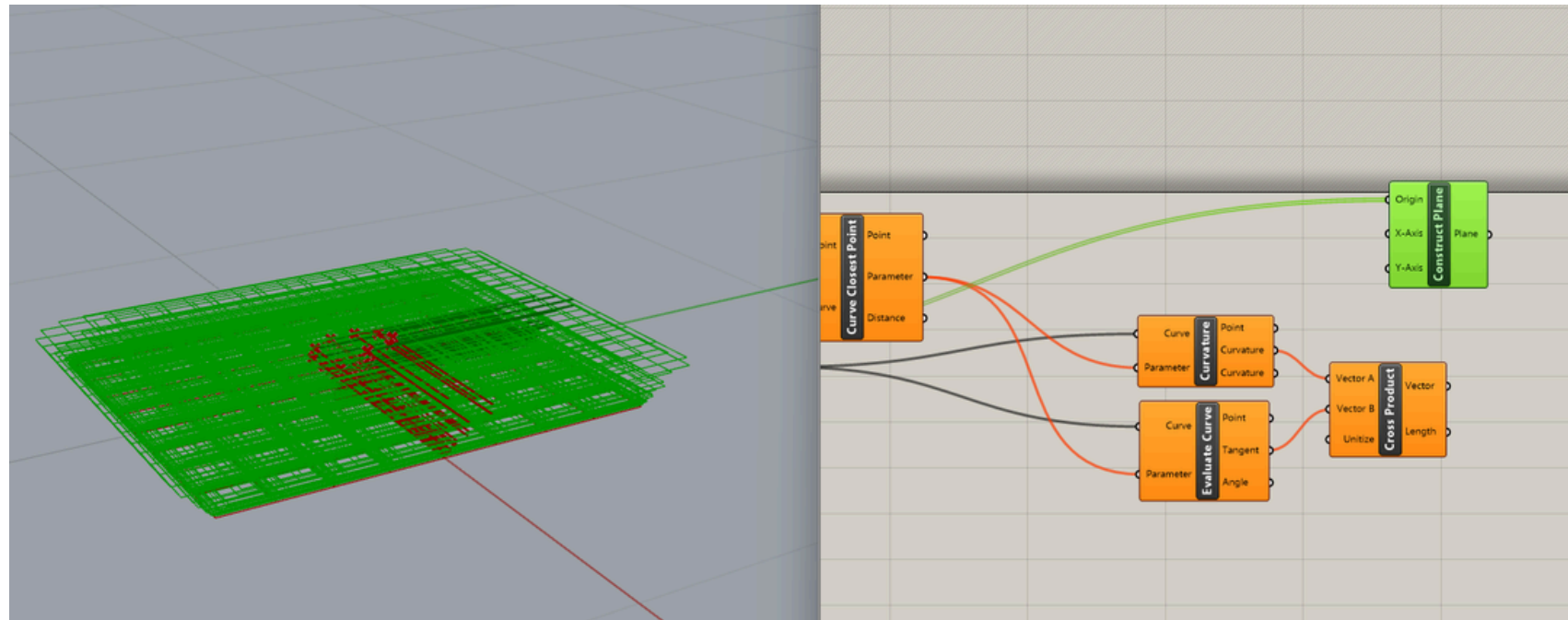


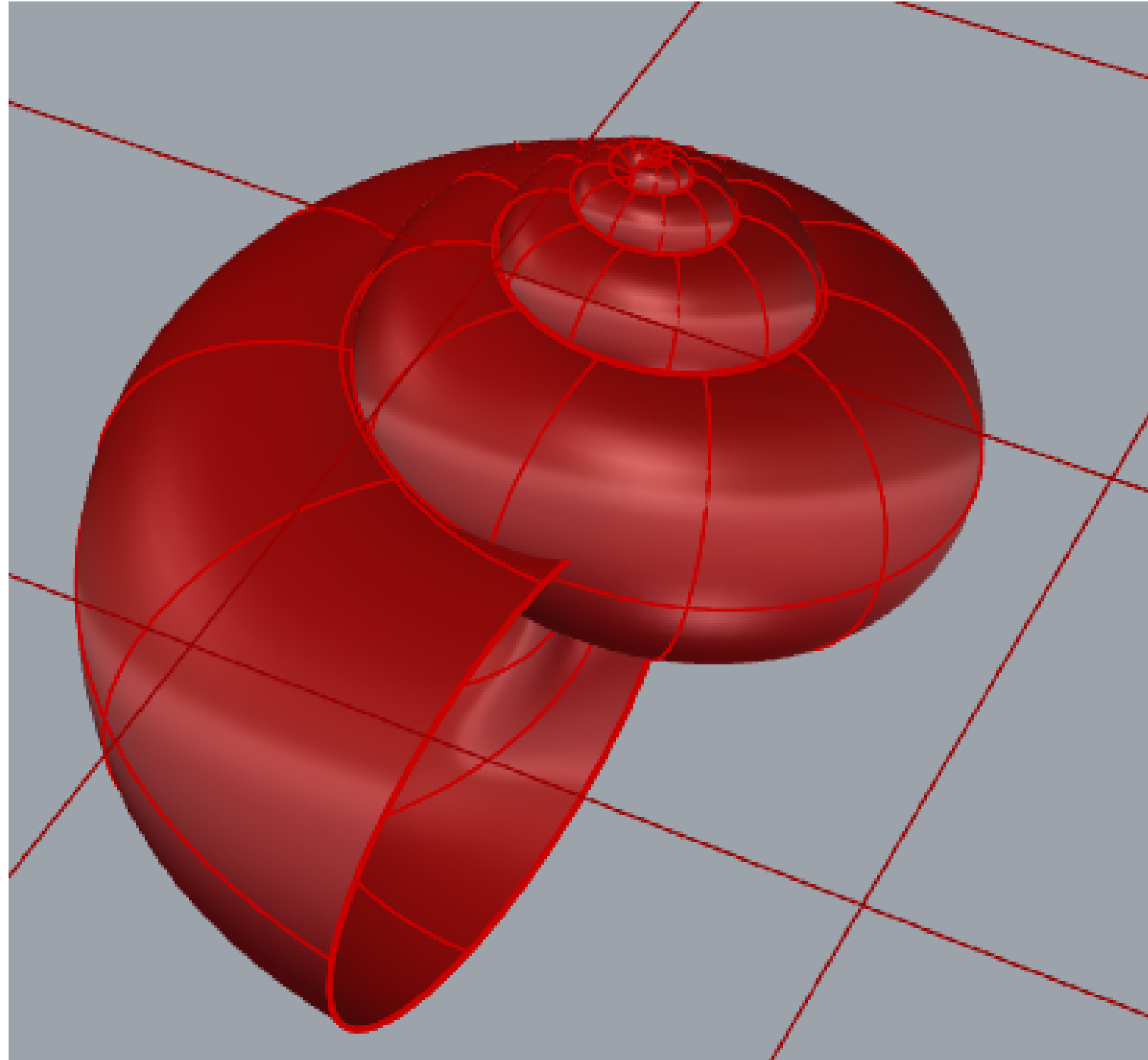


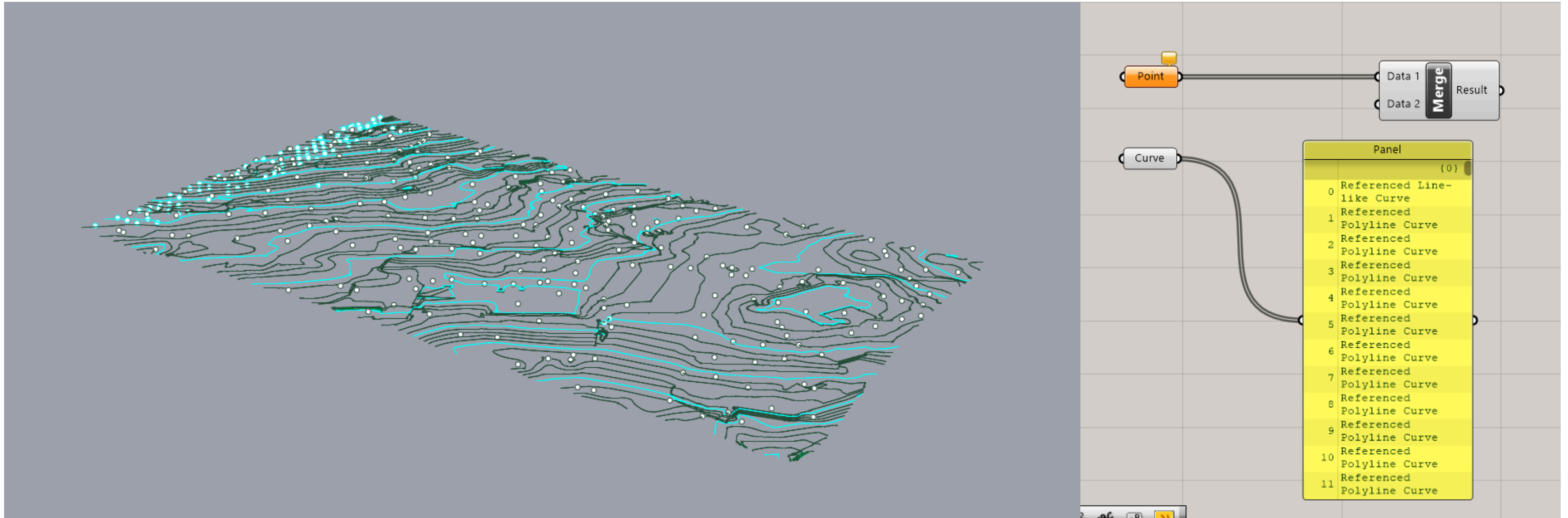


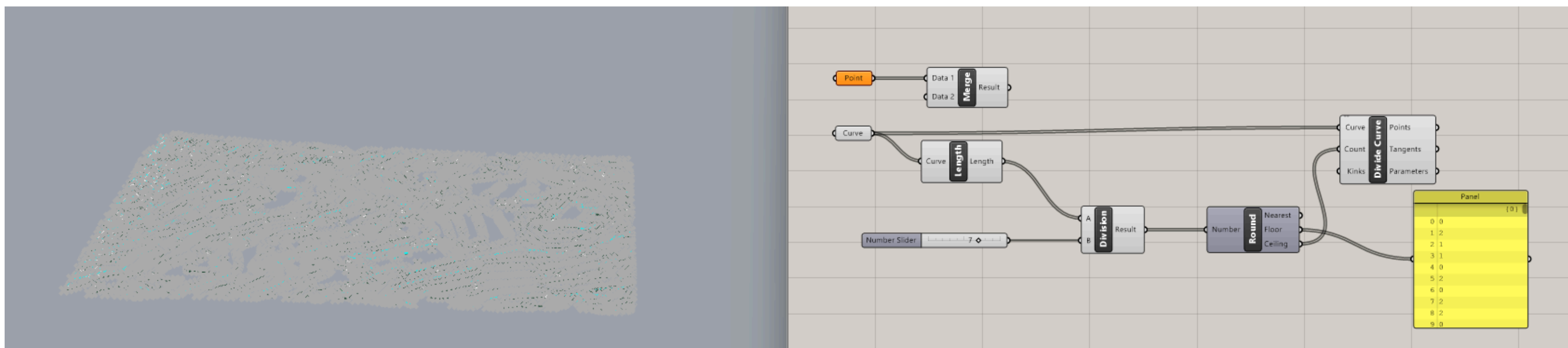


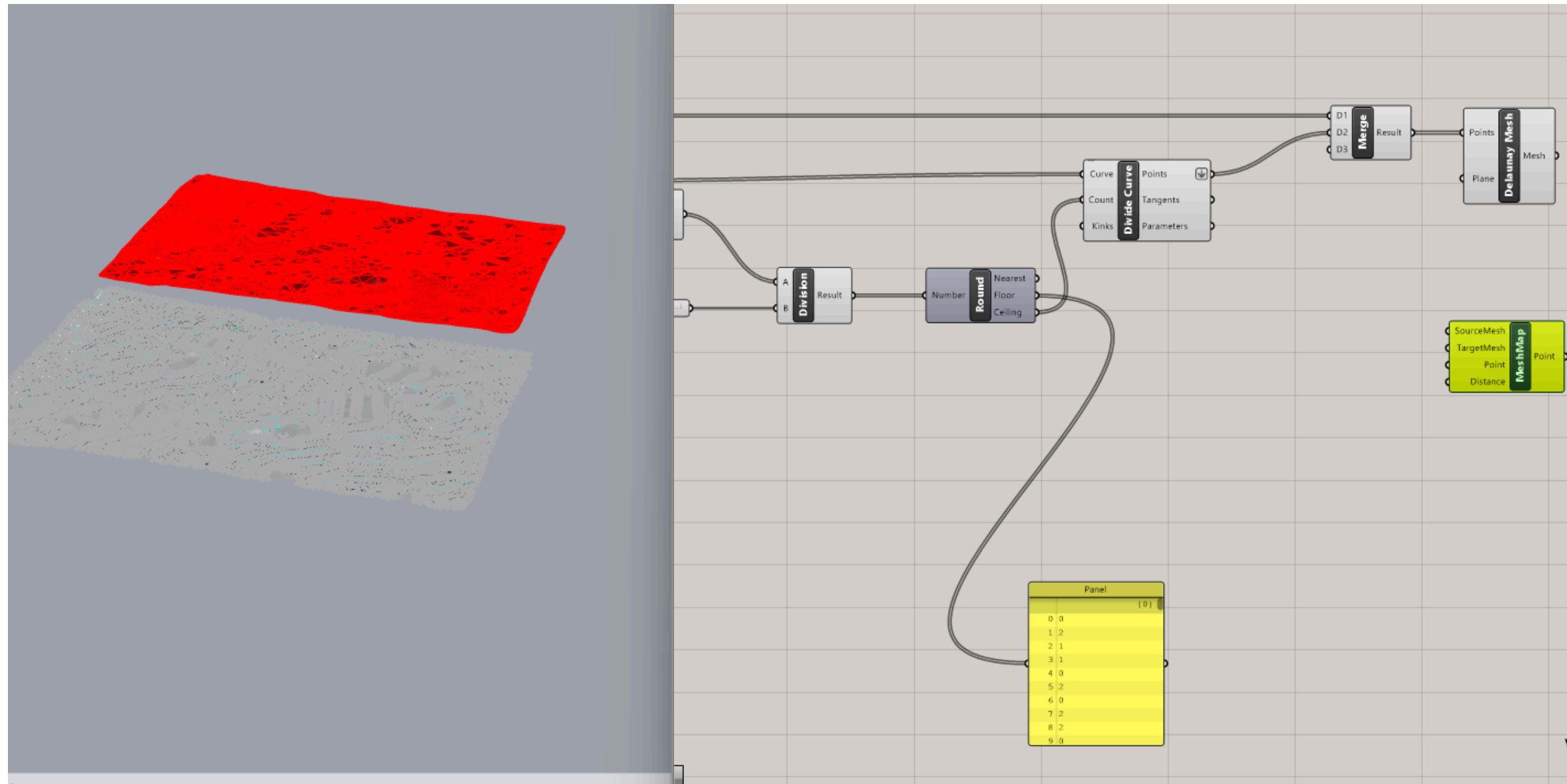


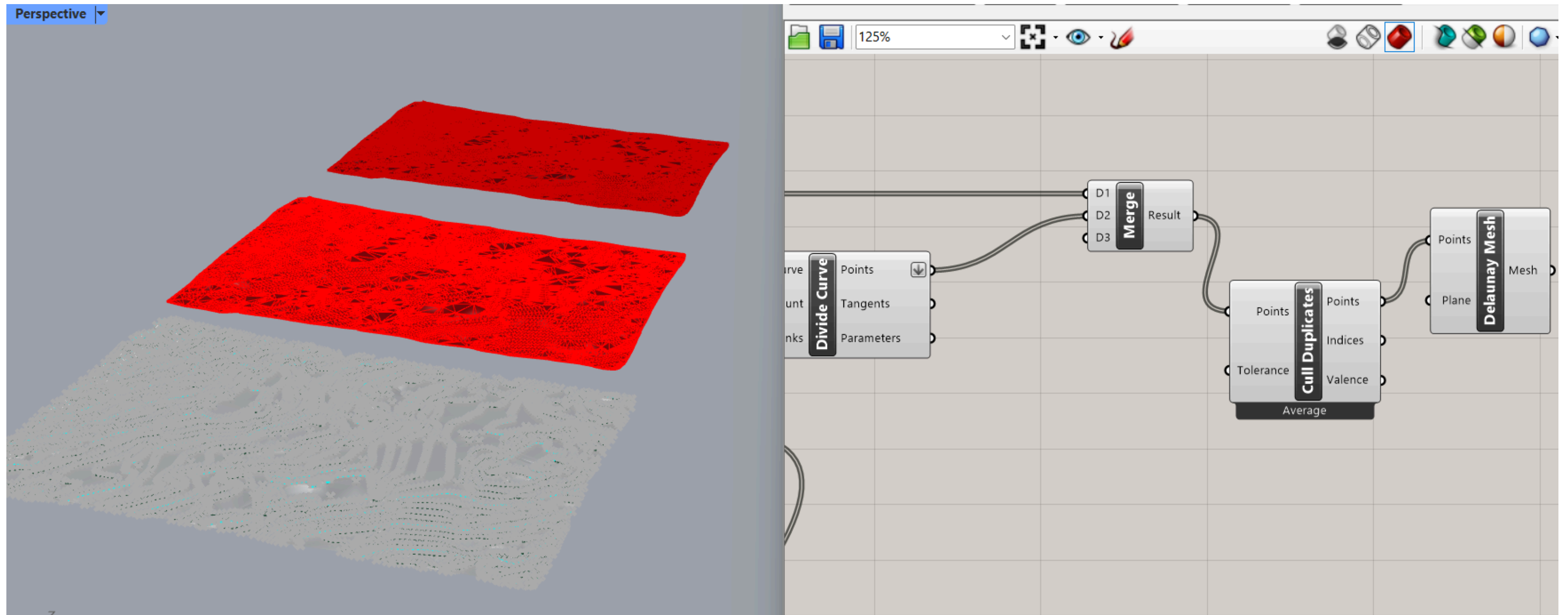




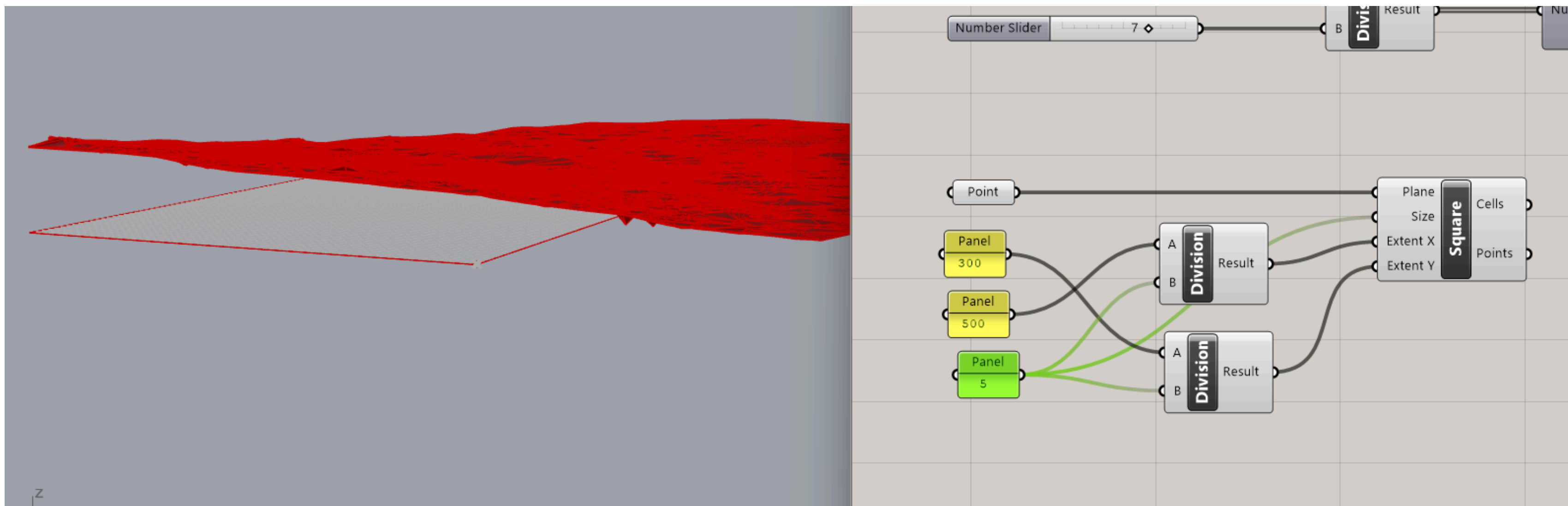


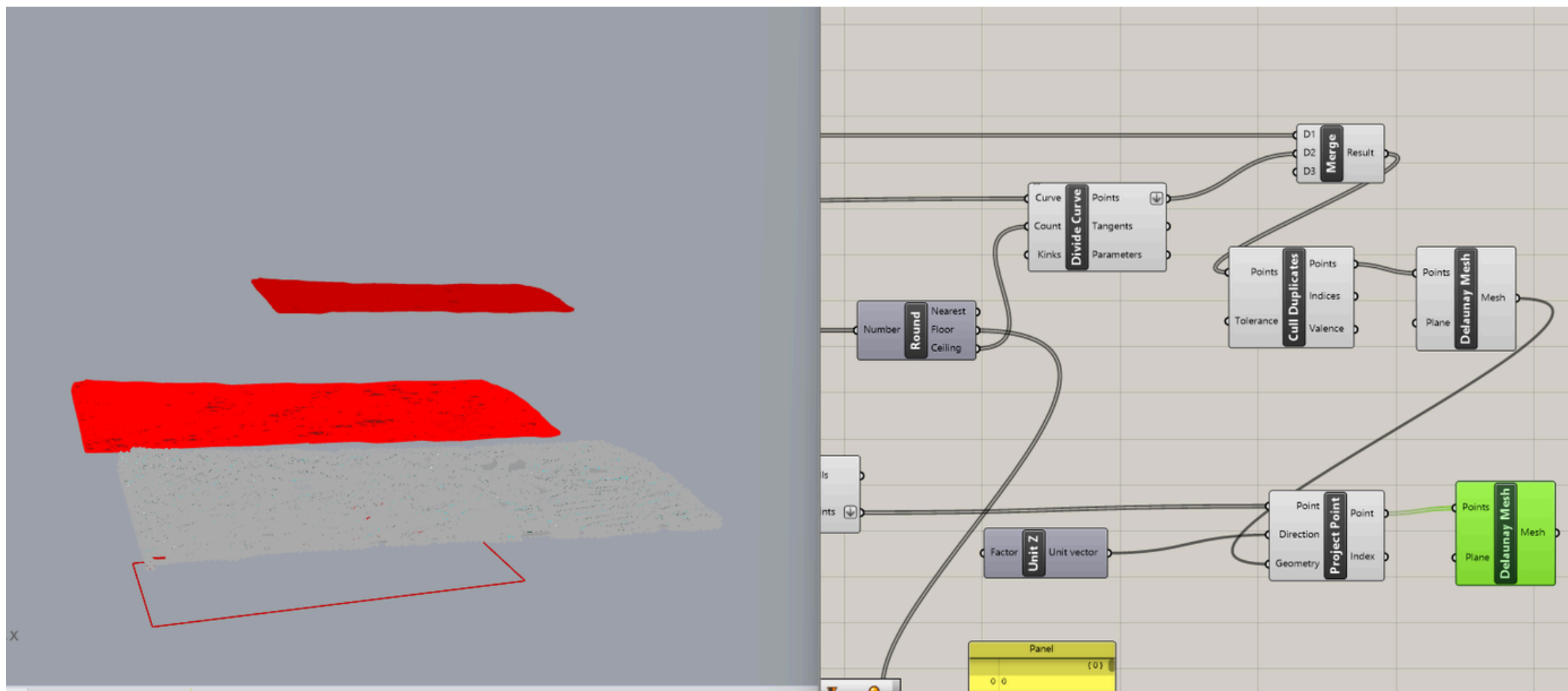


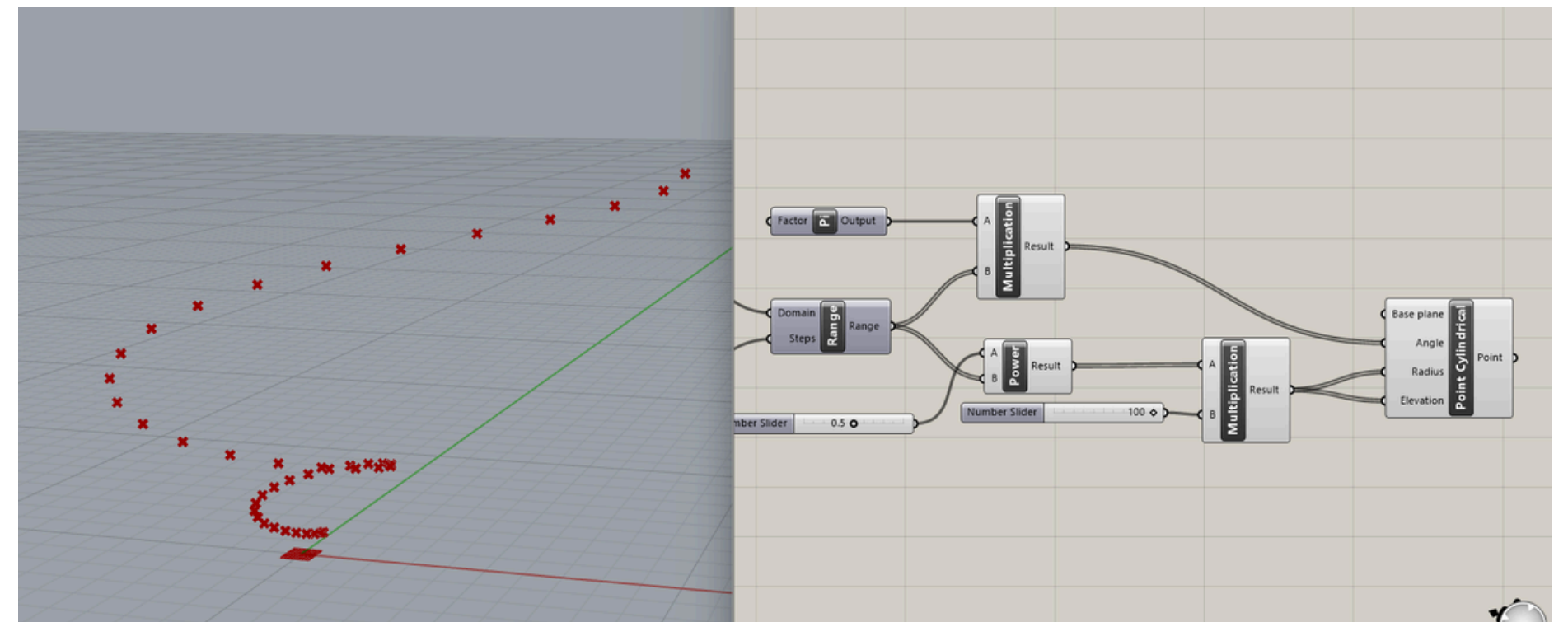
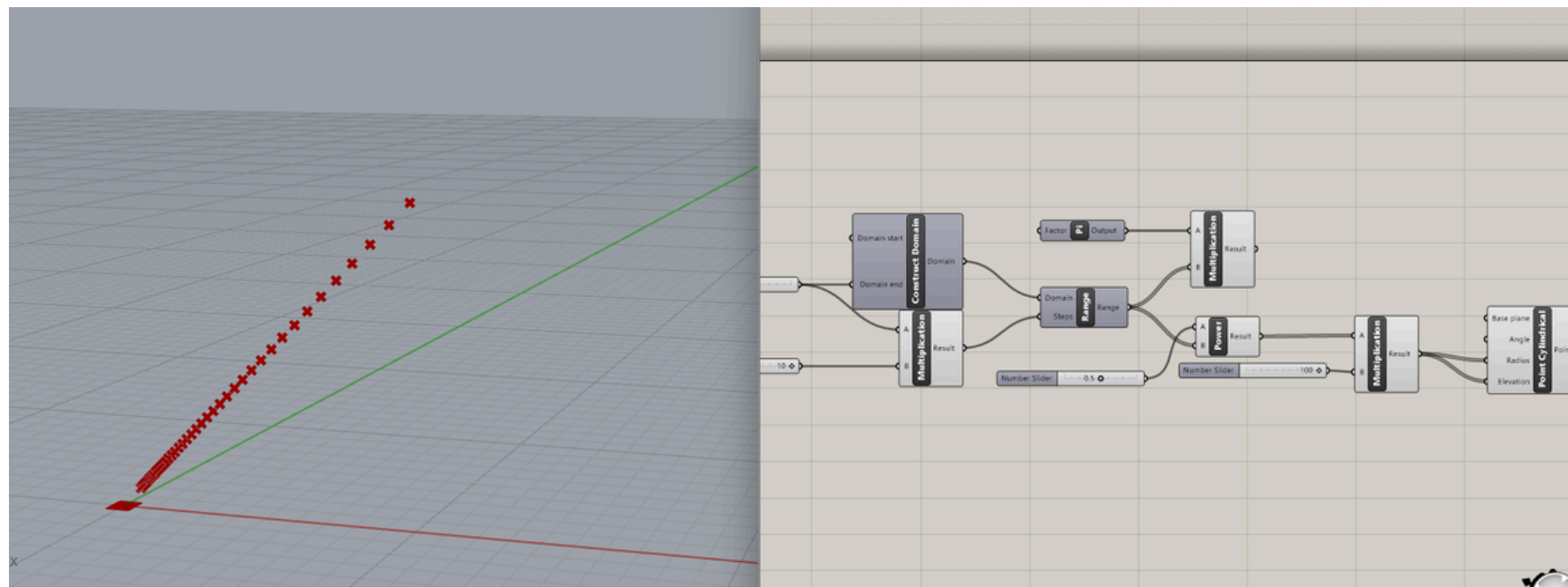




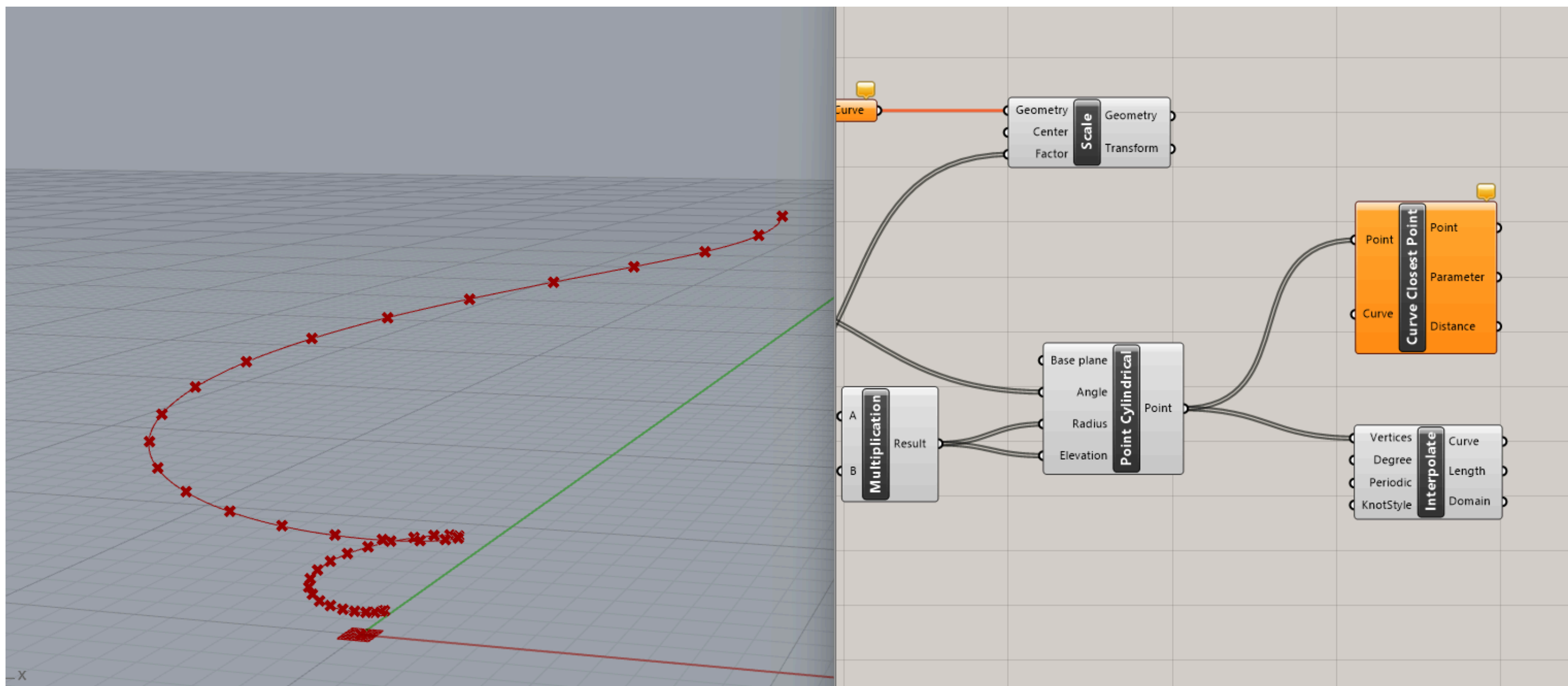
Aula 12



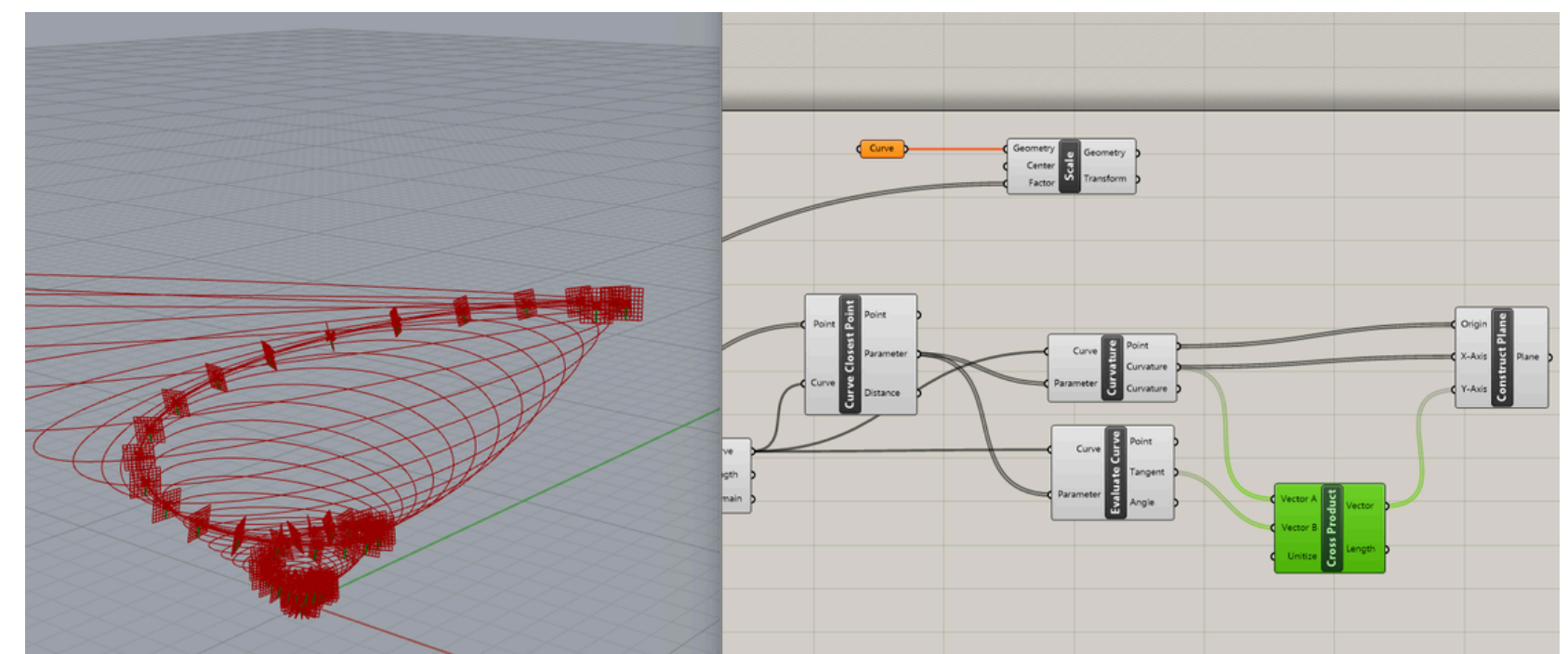
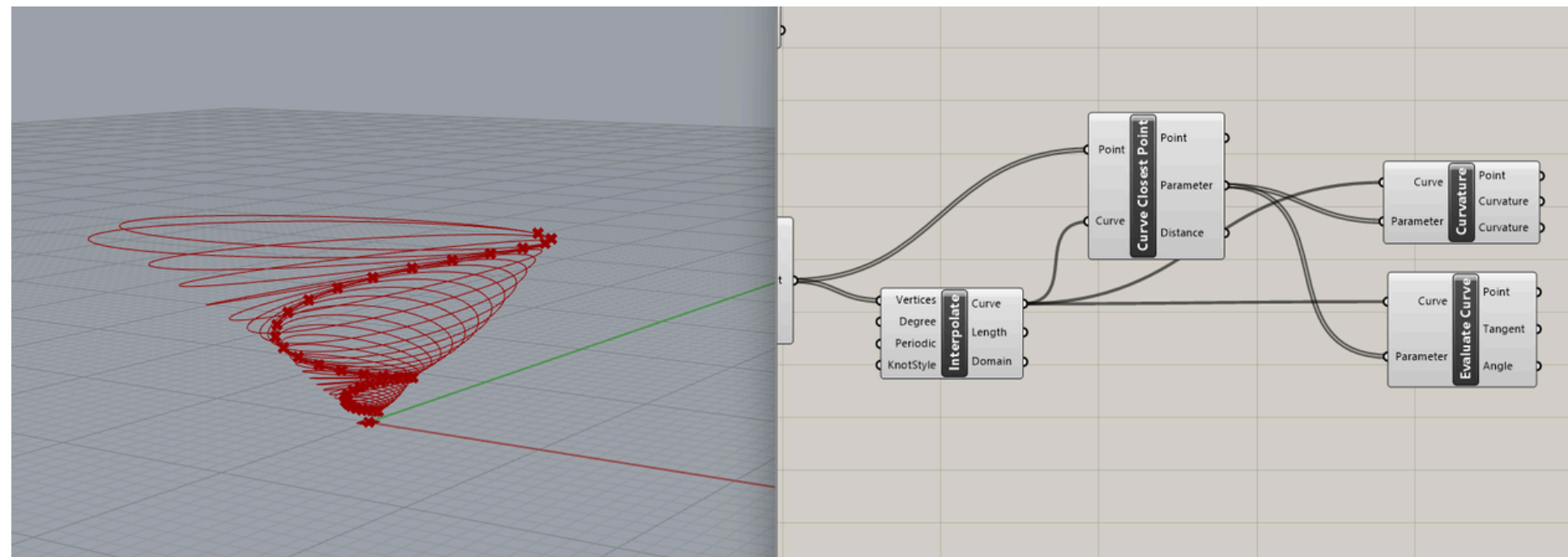




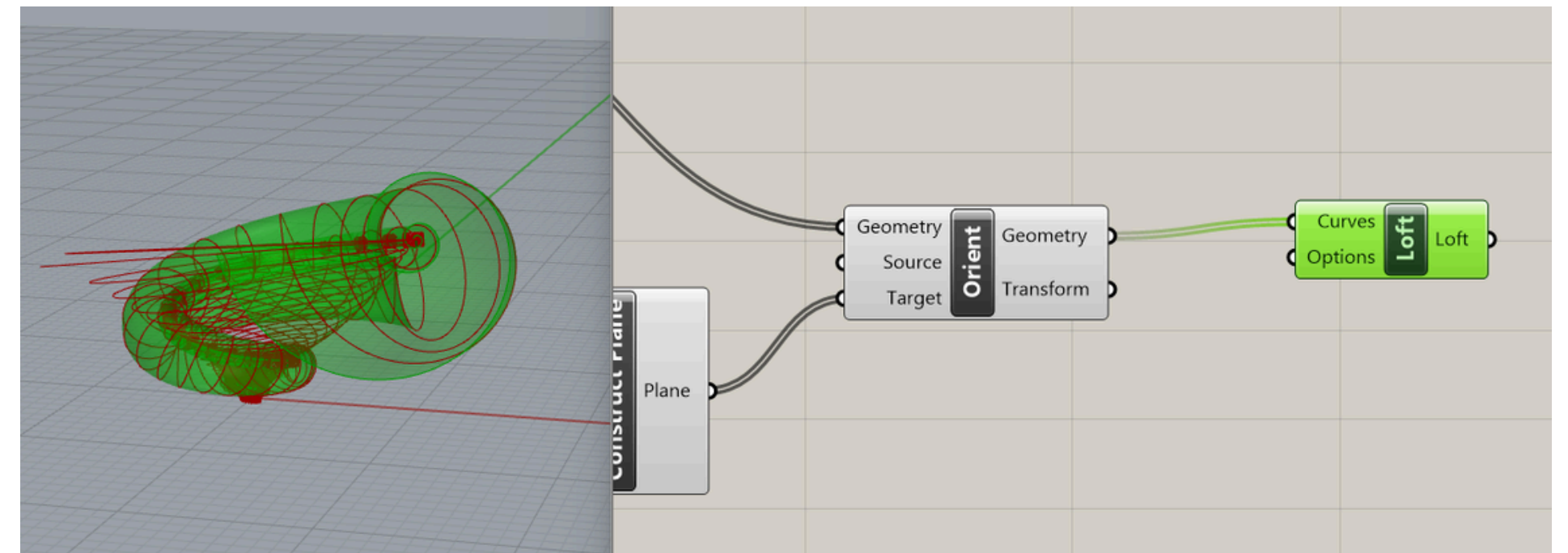
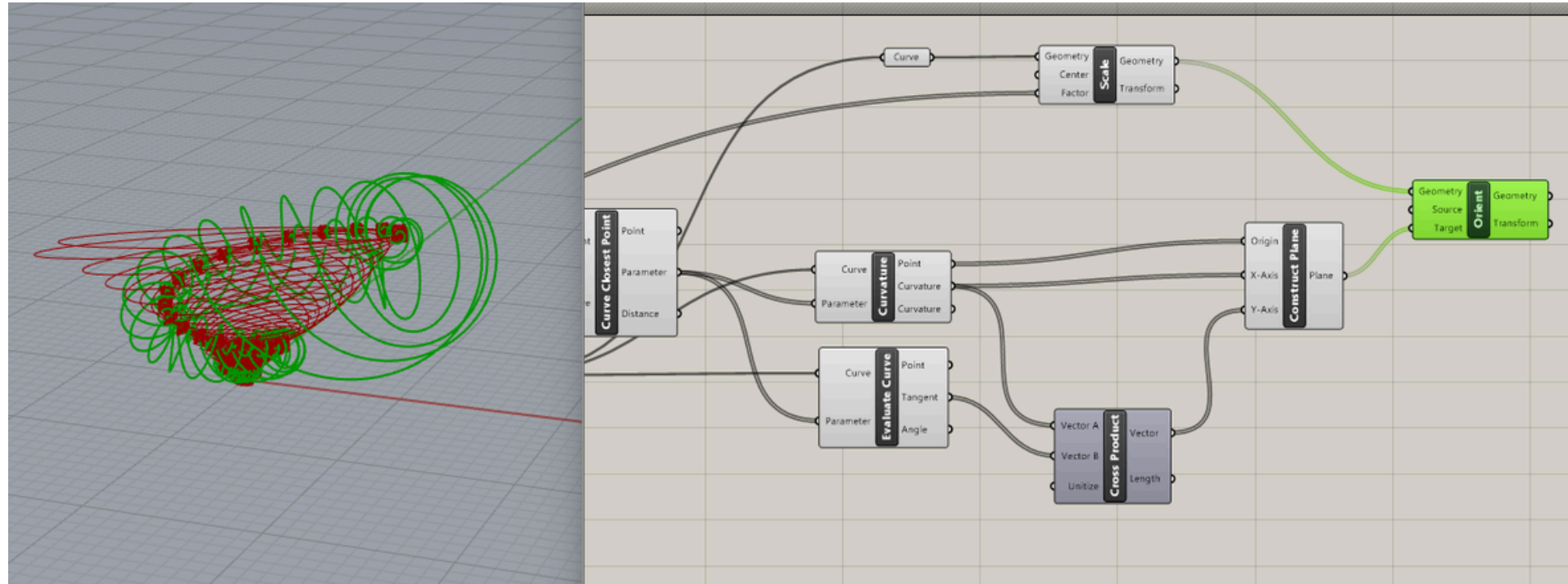
Trabalho 3



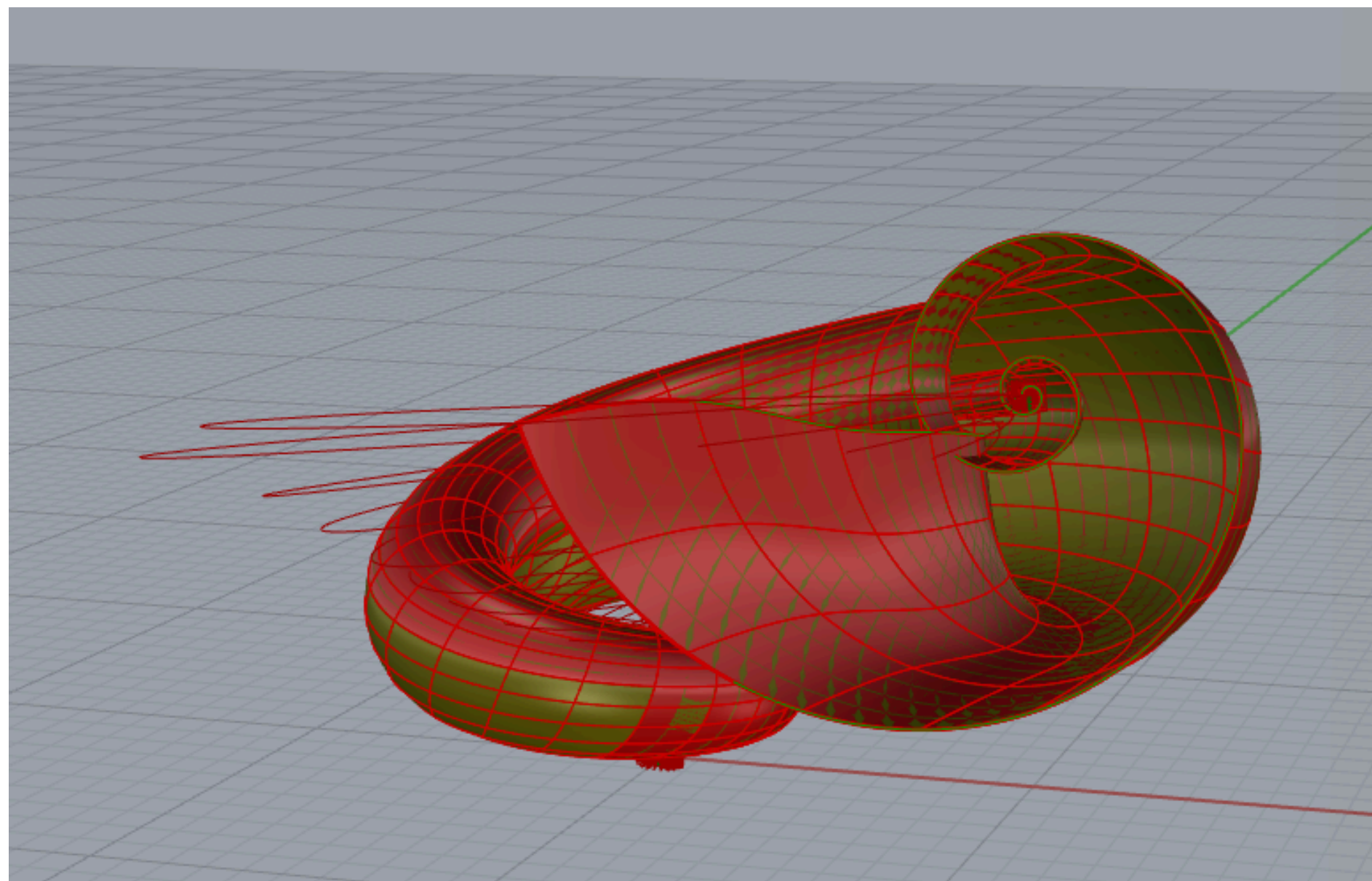
Trabalho 3



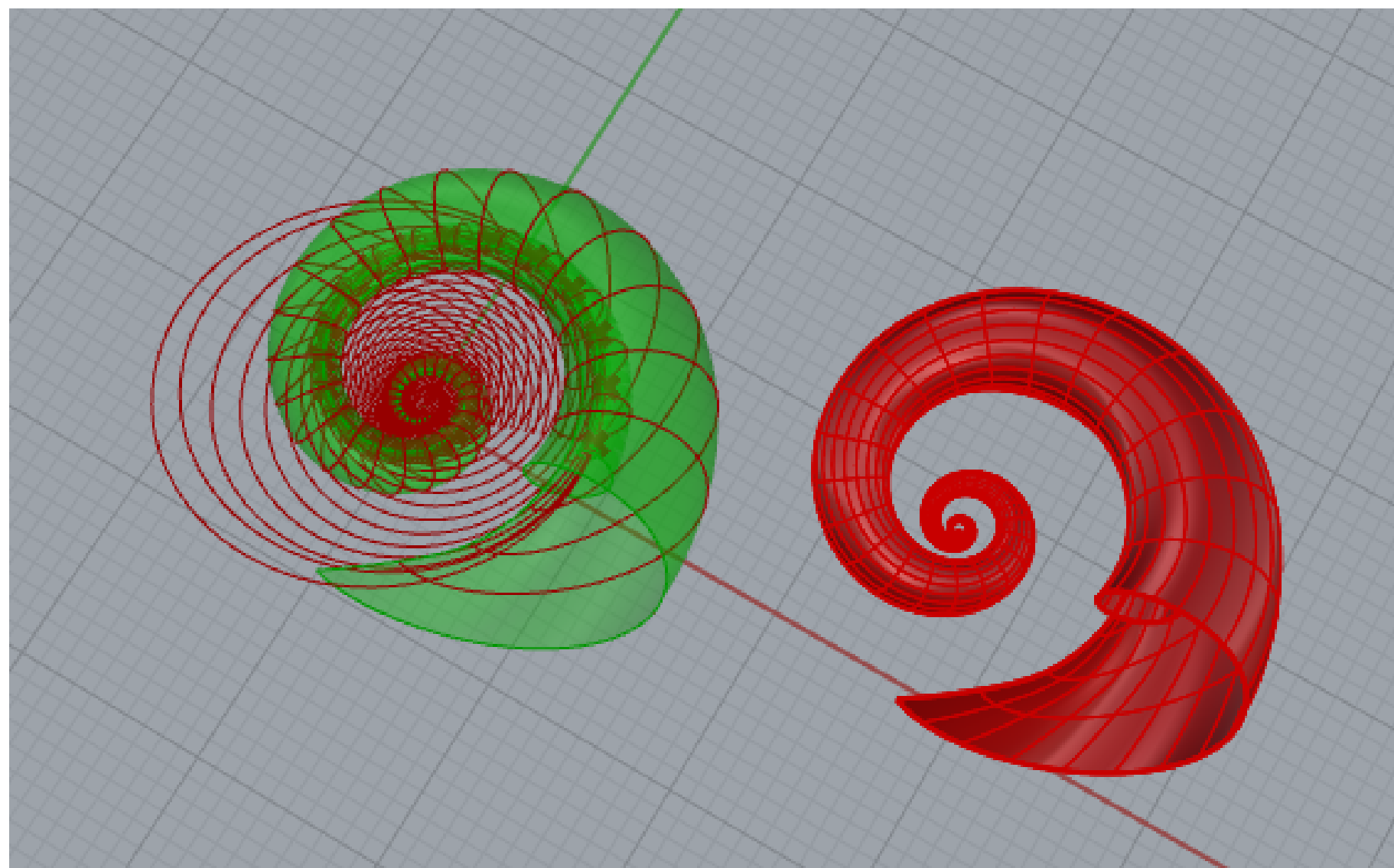
Trabalho 3



Trabalho 3



Trabalho 3



Trabalho 3