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Zürcher Hochschule der Künste
Bachelor of Arts in Design

Bits & Atoms

Computer Aided Design

3rd Semester | 27th of September 2018

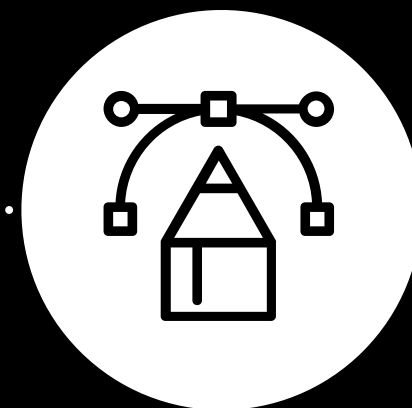
Florian Wille

Overview

Bits & Atoms: Computer Aided Design

27.09.2018

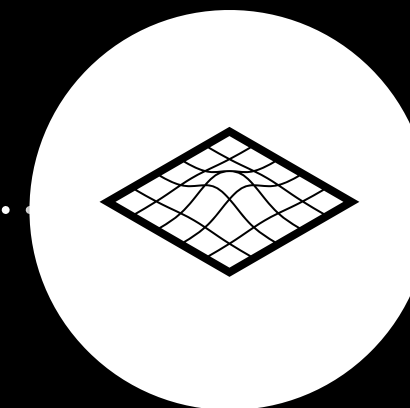
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Rhino Basics

04.10.2018

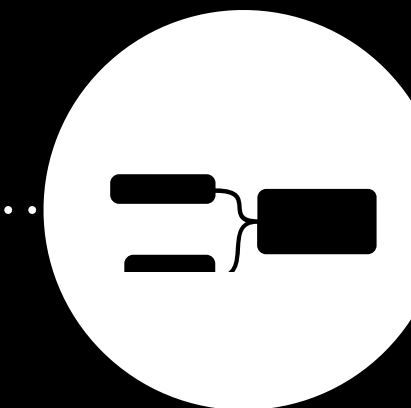
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**Rhino to
Grasshopper**

11.10.2018

⋮



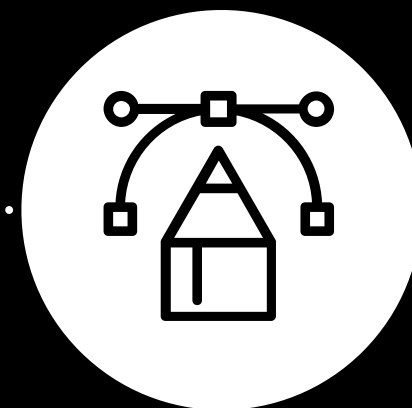
**Parametric
Design with
Grasshopper**

Overview

Bits & Atoms: Computer Aided Design

27.09.2018

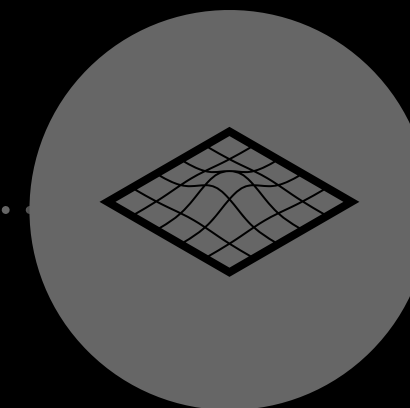
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Rhino Basics

04.10.2018

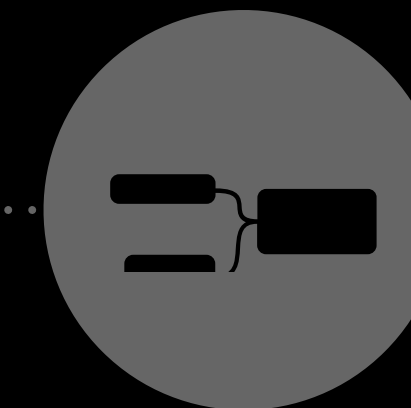
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**Rhino to
Grasshopper**

11.10.2018

⋮



**Parametric
Design with
Grasshopper**

Install Rhino 3D

Rhino 3D

Rhino 3D

Interface - Editing

The screenshot displays the Rhino 3D software interface with a truncated cone model. The interface is divided into several panels:

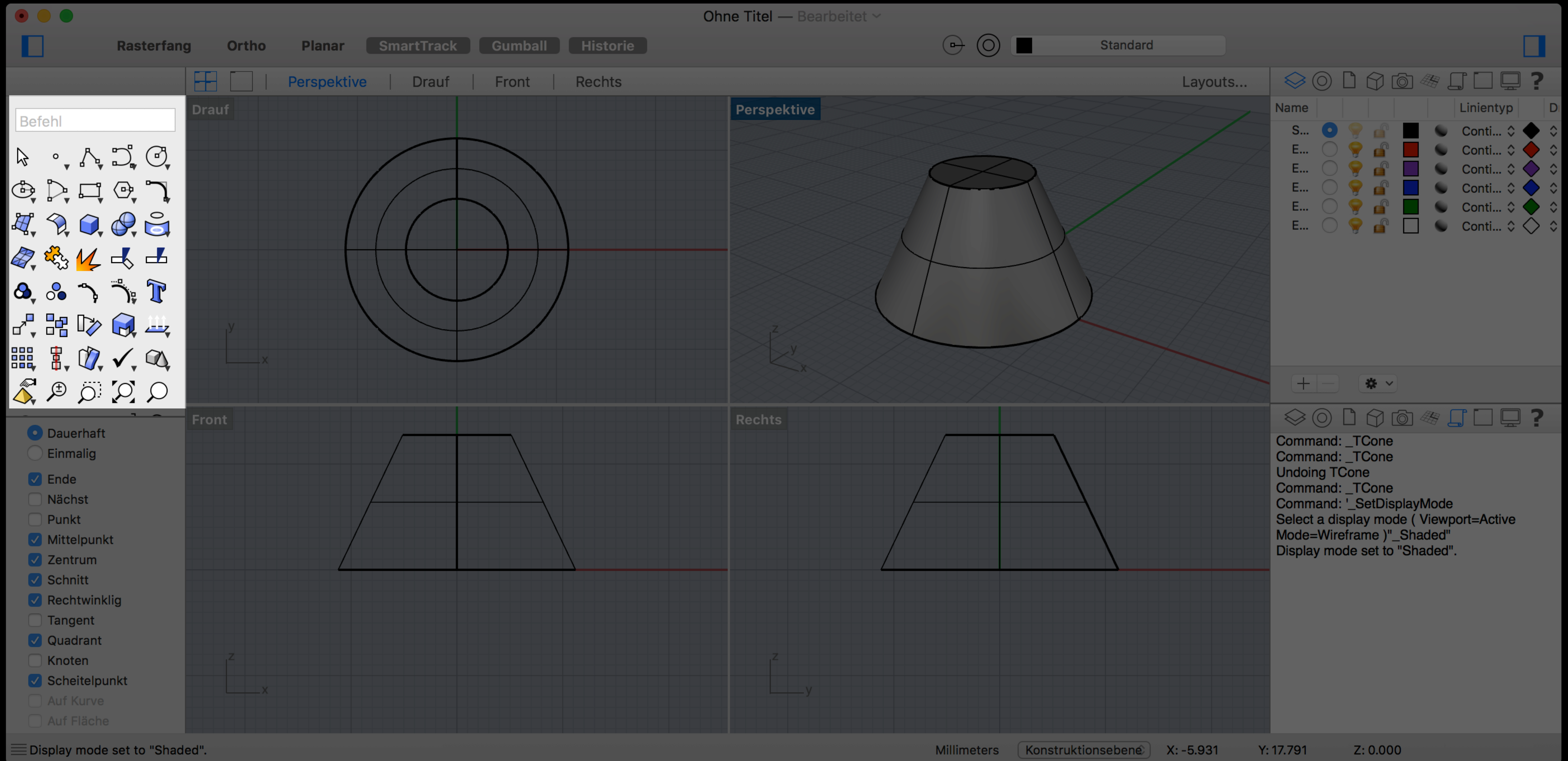
- Top Panel:** Contains window management icons (red, yellow, green), the title bar "Ohne Titel — Bearbeitet", and toolbars for "Rasterfang", "Ortho", "Planar", "SmartTrack", "Gumball", and "Historie".
- Viewports:** Four viewports are shown: "Drauf" (top view), "Perspektiv" (perspective view), "Front" (front view), and "Rechts" (right side view). Each viewport shows a different projection of the truncated cone.
- Left Panel:** A "Befehl" (Command) toolbar with various icons for creating and editing objects.
- Right Panel:** A "Linientyp" (Line Style) panel with a table of line styles and a command history window.
- Bottom Panel:** A status bar showing "Display mode set to 'Shaded'", "Millimeters", "Konstruktionsebene", and coordinates "X: -5.931", "Y: 17.791", "Z: 0.000".

Name	Linientyp	D
S...	Conti...	◇
E...	Conti...	◇
E...	Conti...	◇
E...	Conti...	◇
E...	Conti...	◇
E...	Conti...	◇

Command: _TCone
Command: _TCone
Undoing TCone
Command: _TCone
Command: '_SetDisplayMode
Select a display mode (Viewport=Active
Mode=Wireframe)" _Shaded"
Display mode set to "Shaded".

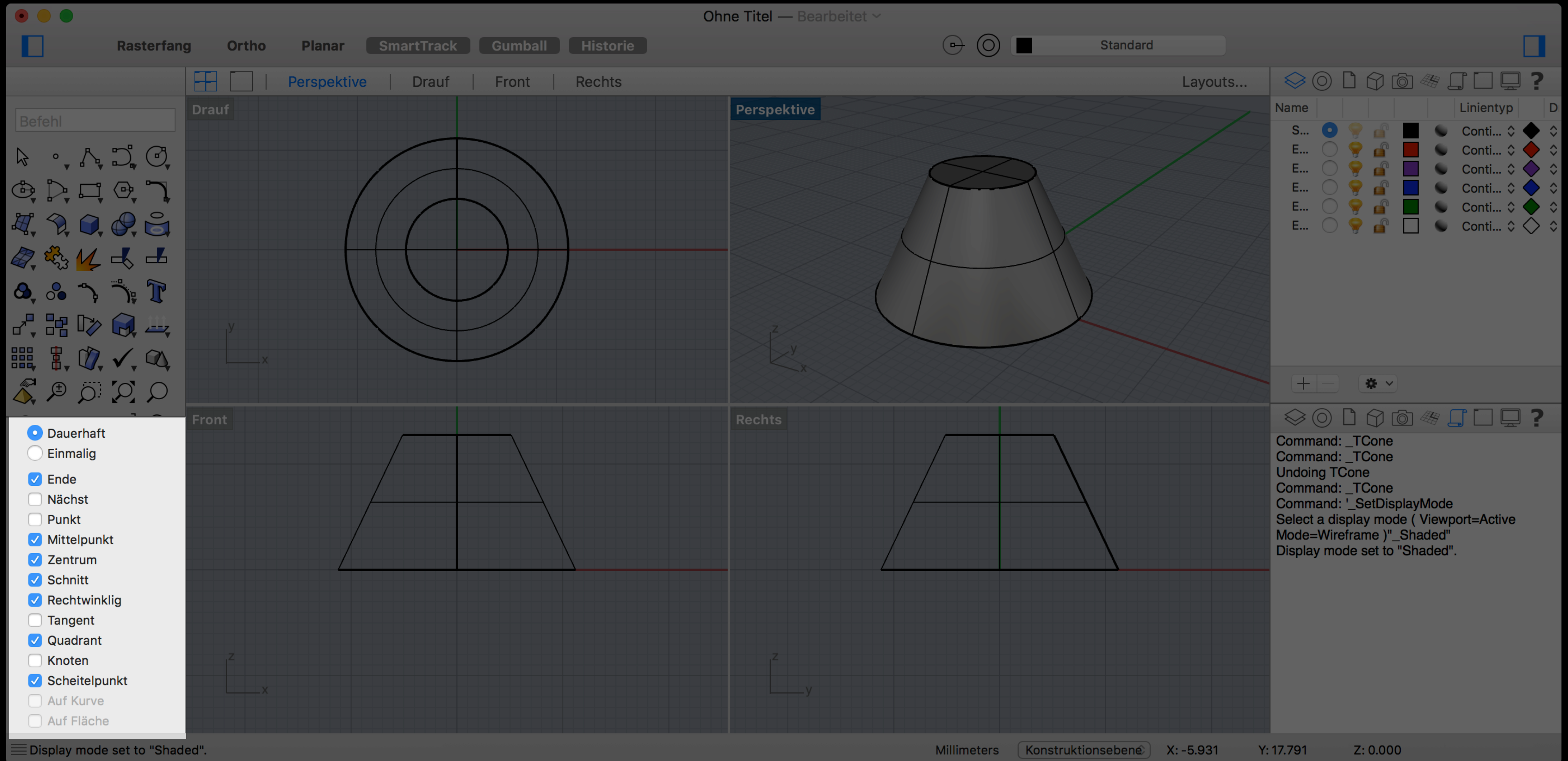
Rhino 3D

Interface - Editing



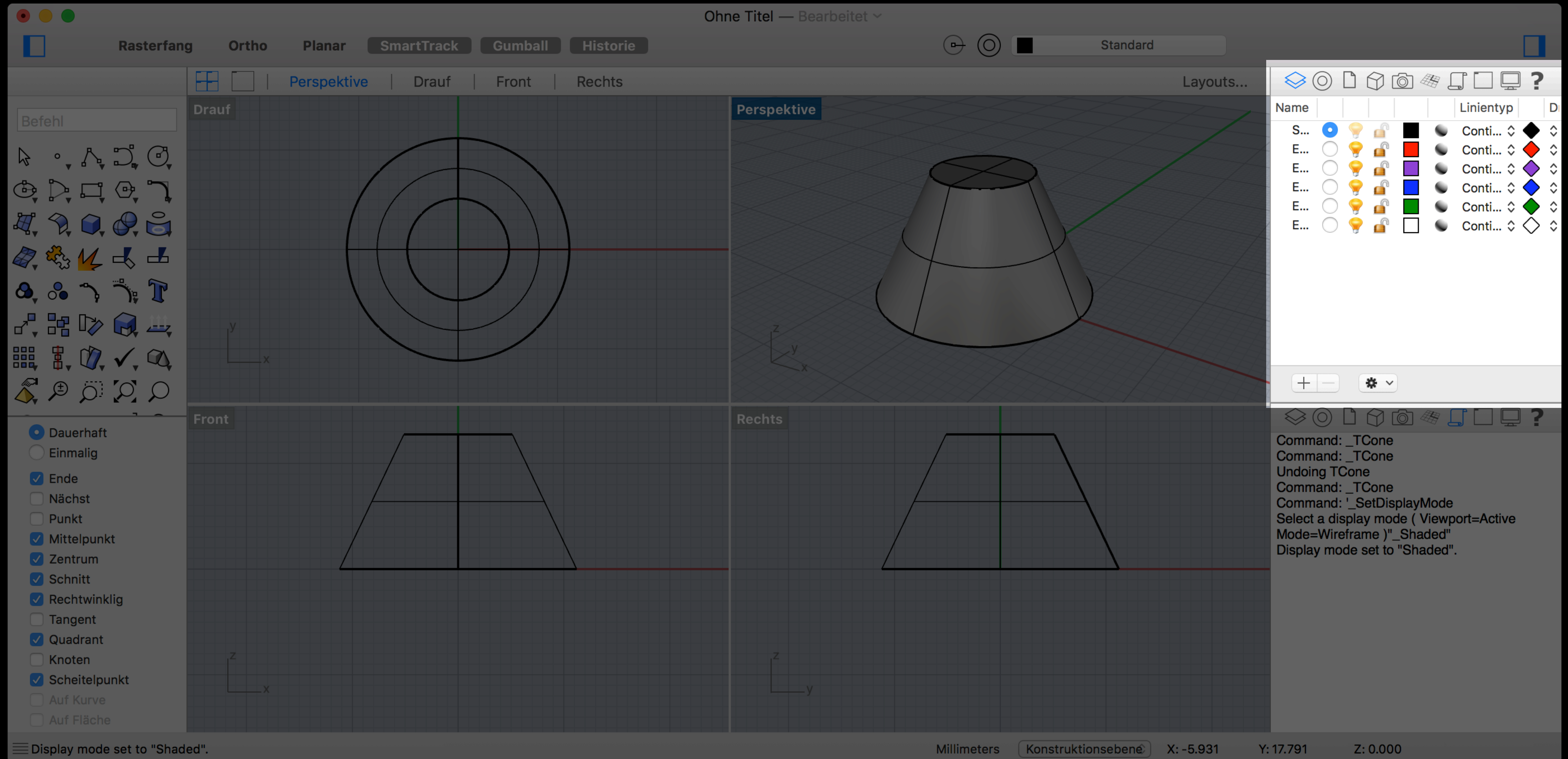
Rhino 3D

Interface - Editing



Rhino 3D

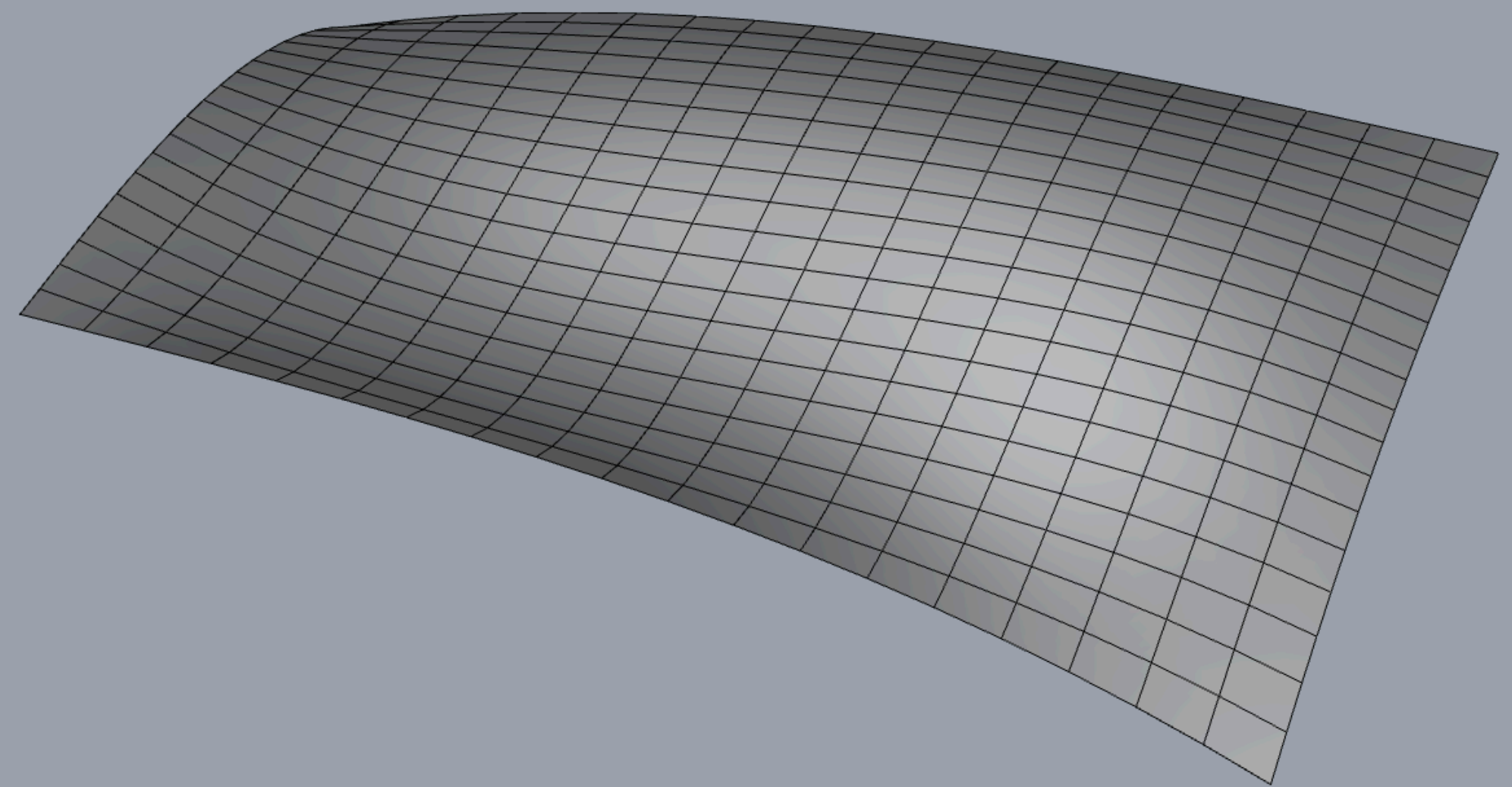
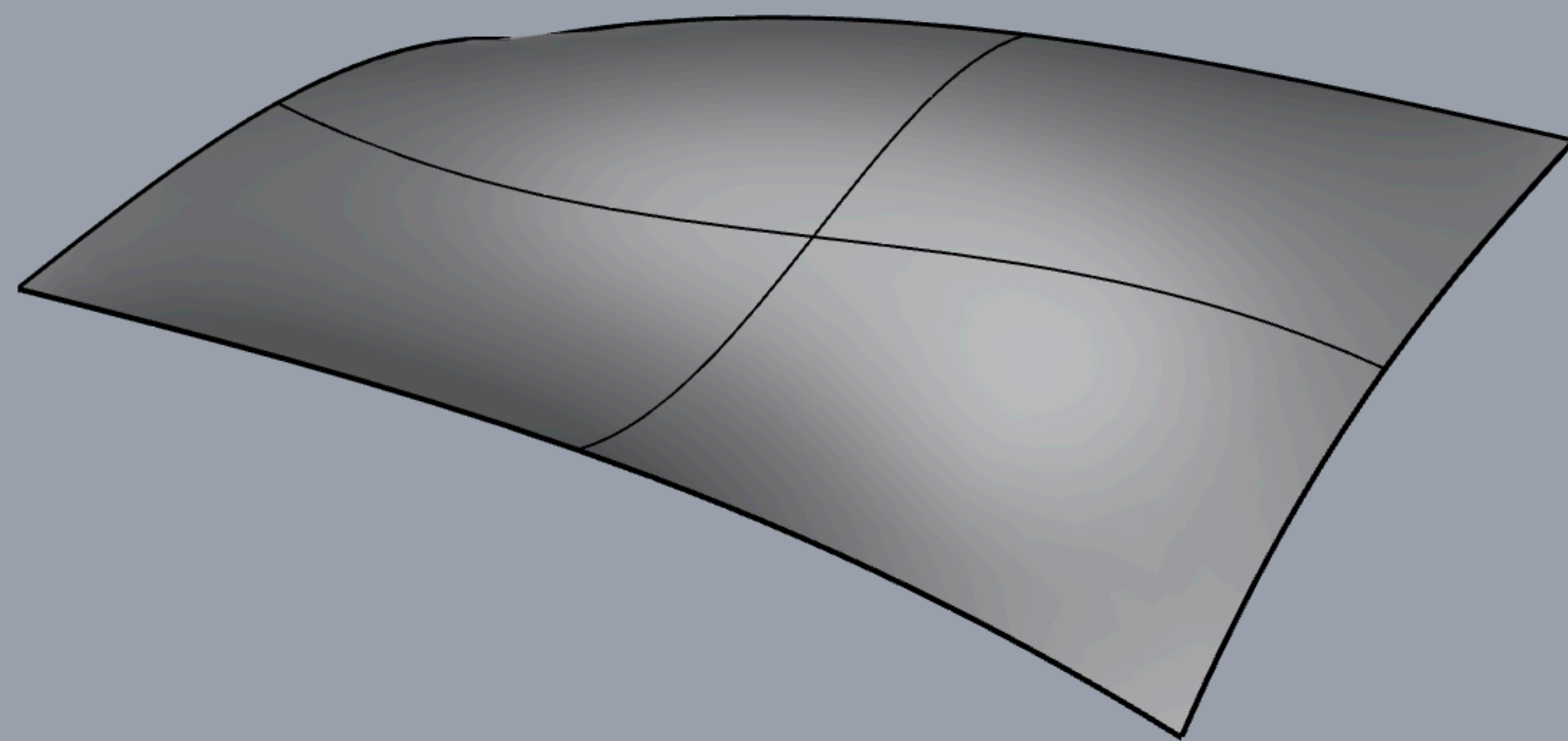
Interface - Layers



Creating and Editing Geometry

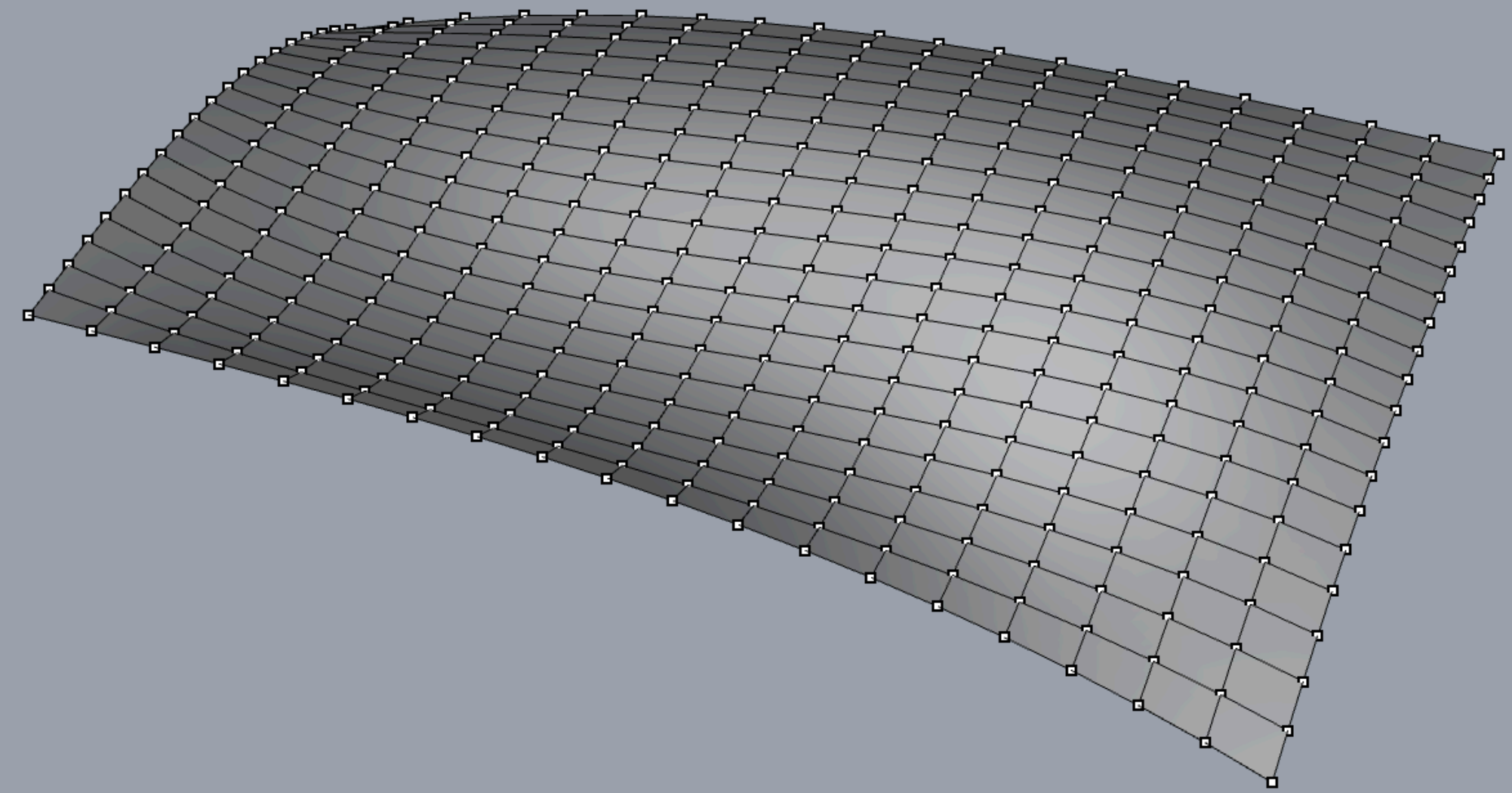
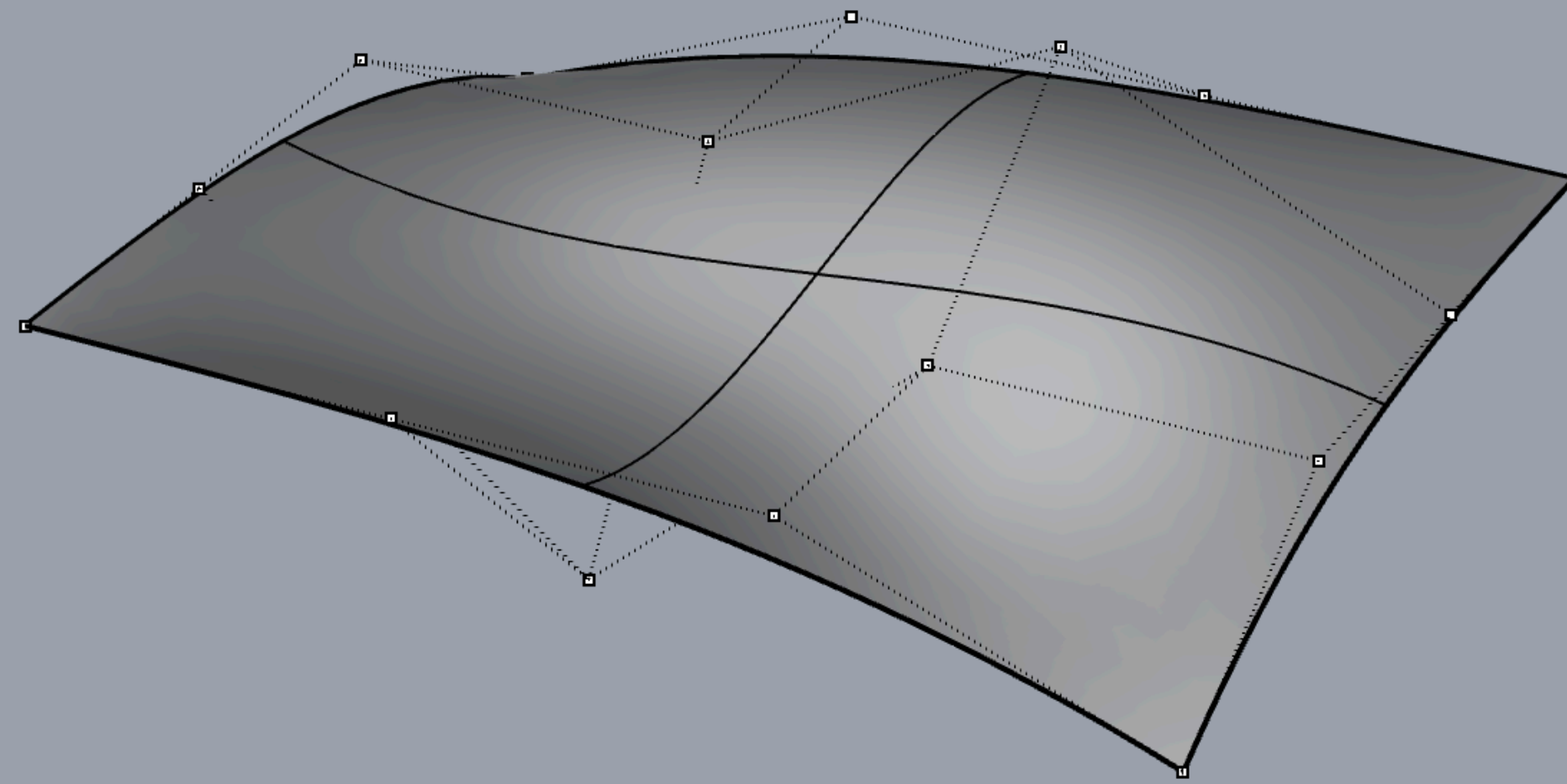
Rhino 3D

Nurbs vs. Polygons



Rhino 3D

Nurbs vs. Polygons

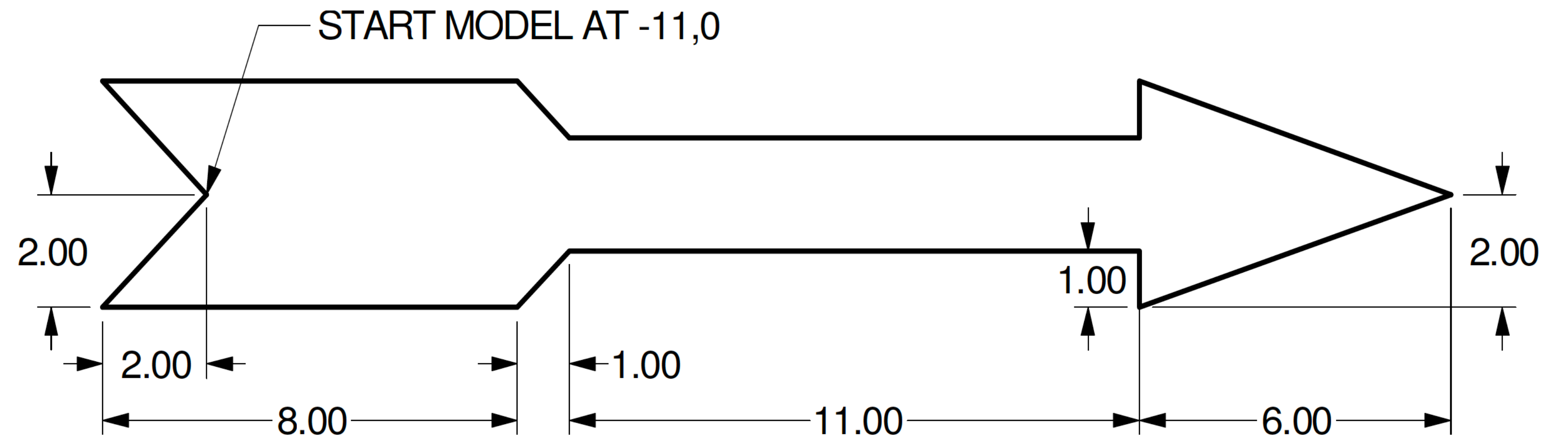


EXERCISE01

Create and Edit 2D Geometry

EXERCISE01

2D & 3D Creation and Editing



create & edit 2D:

_line, _circle, _curve, _arc
_move / _mirror / _trim / _extend
_EditPtOn

Use Osnap / Objektfang

Use Gridsnap / Rasterfang

create & edit 3D:

_ExtrudeCrv

EXERCISE02

Circles and Arcs

create & edit 2D:

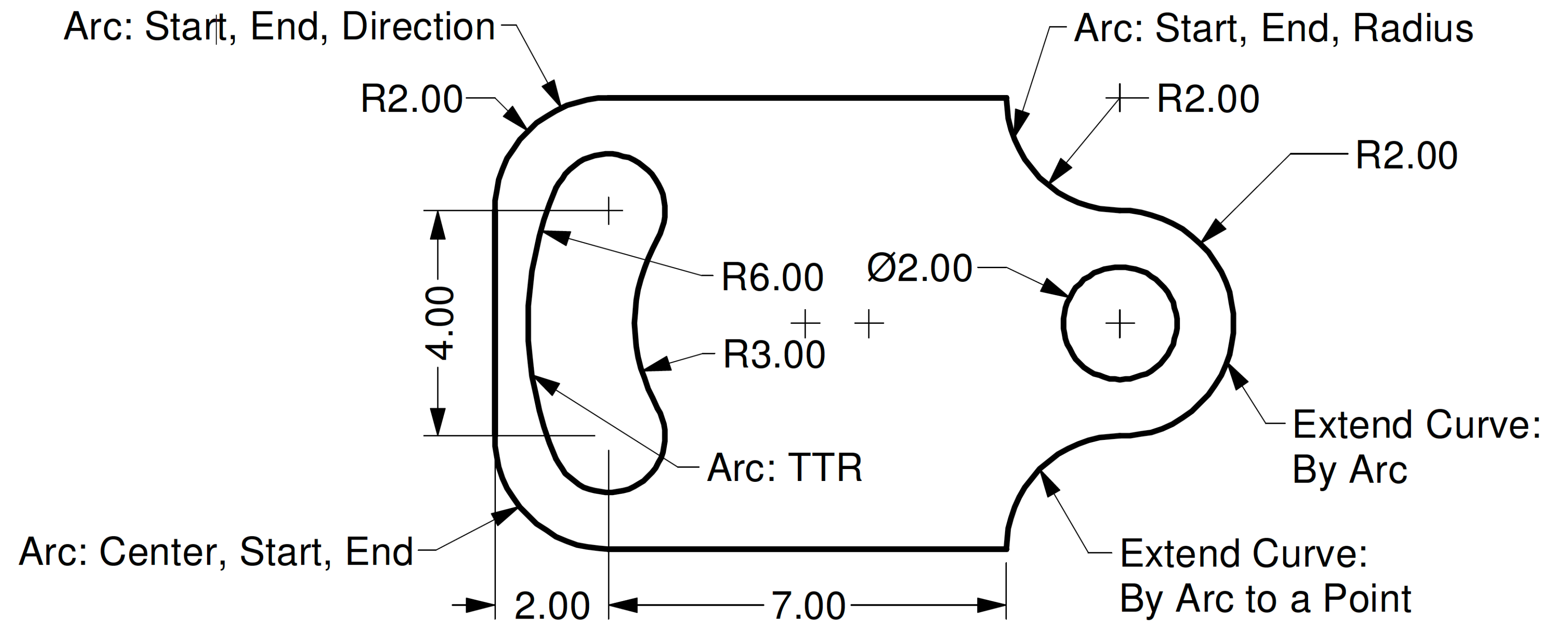
_line, _circle, _curve, _arc
_move / _mirror / _trim / _extend
_EditPtOn

Use Osnap / Objektfang

Use Gridsnap / Rasterfang

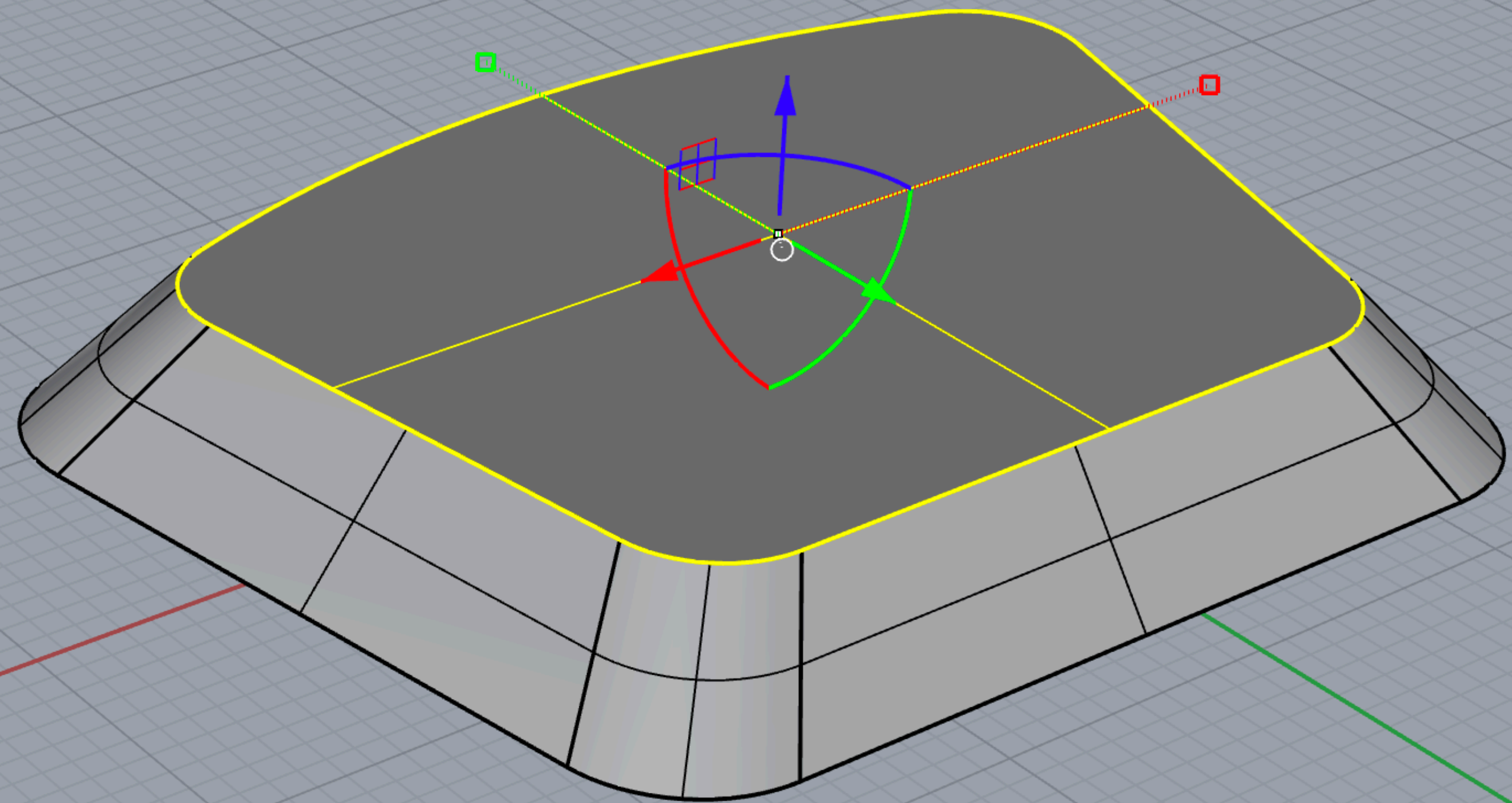
create & edit 3D:

_ExtrudeCrv



EXERCISE03

Modelling with Gumball



Gumball Commands:

move: arrow handles

scale: square handles

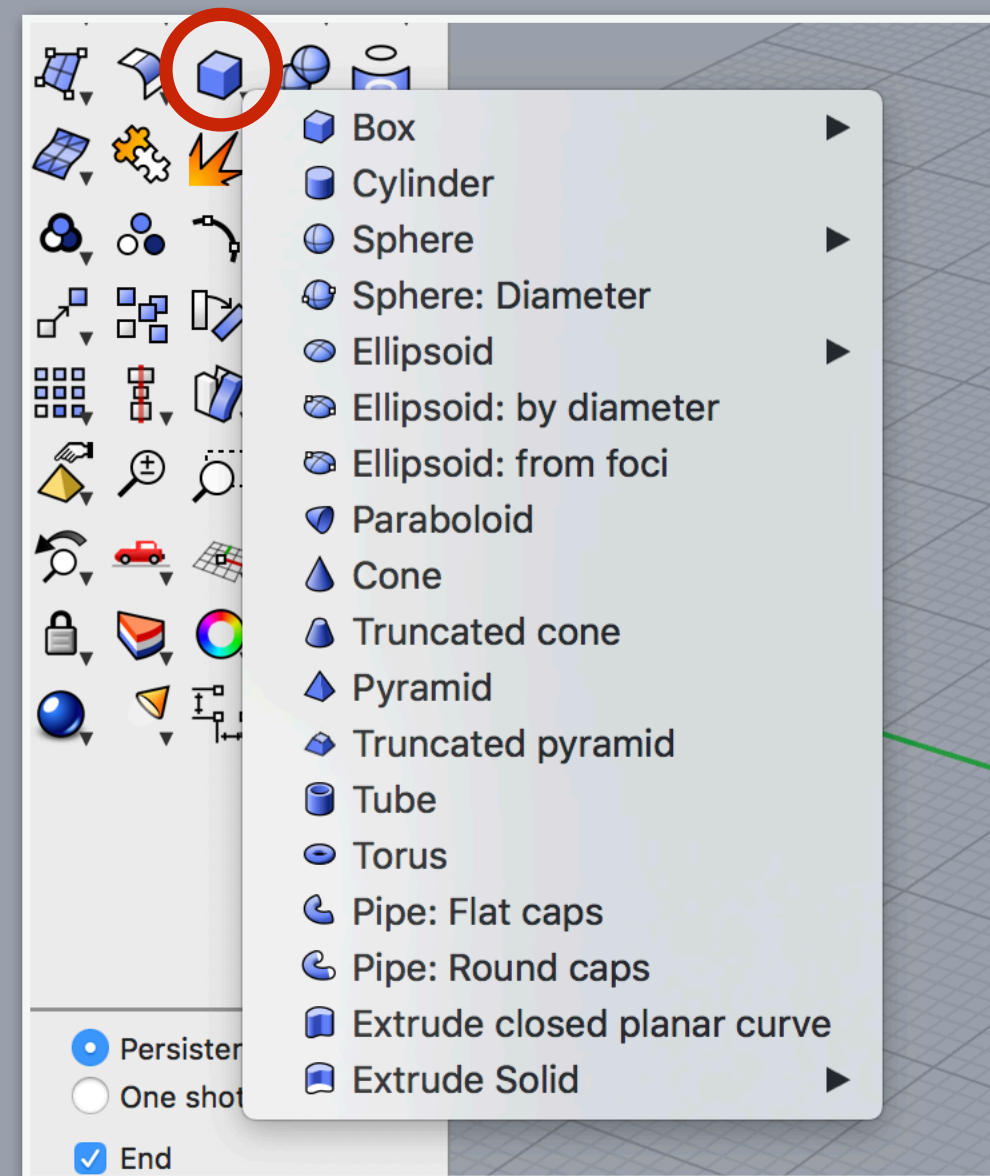
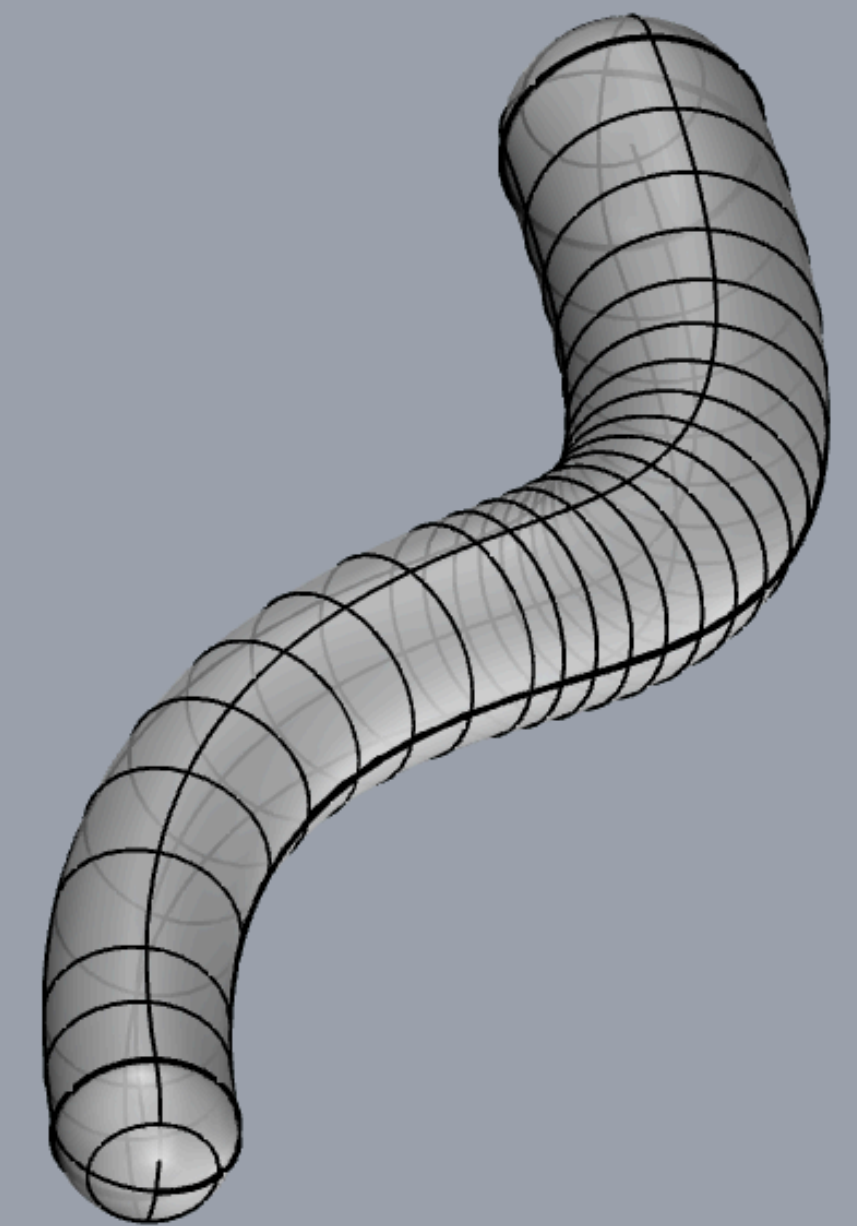
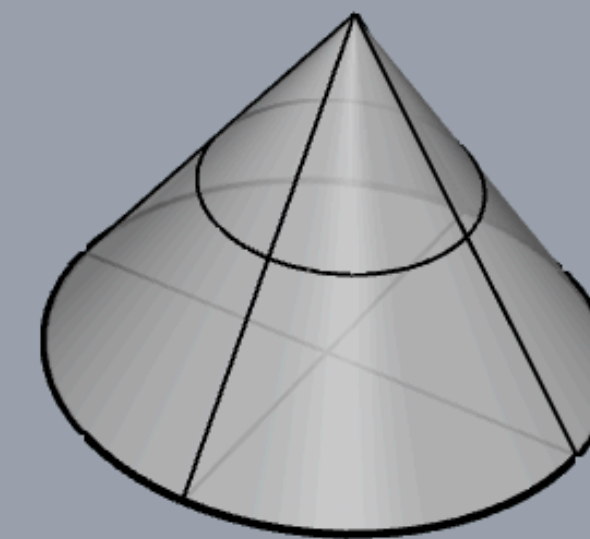
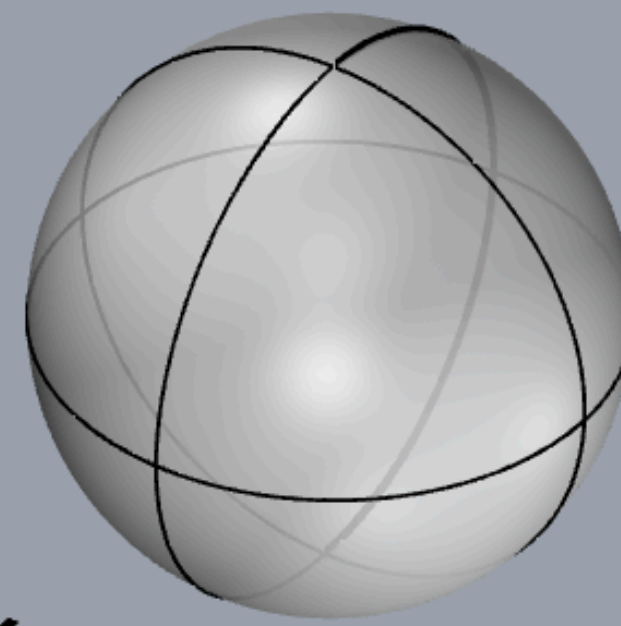
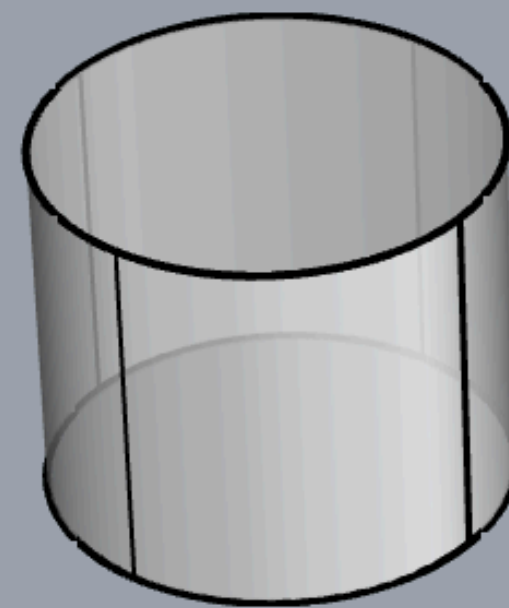
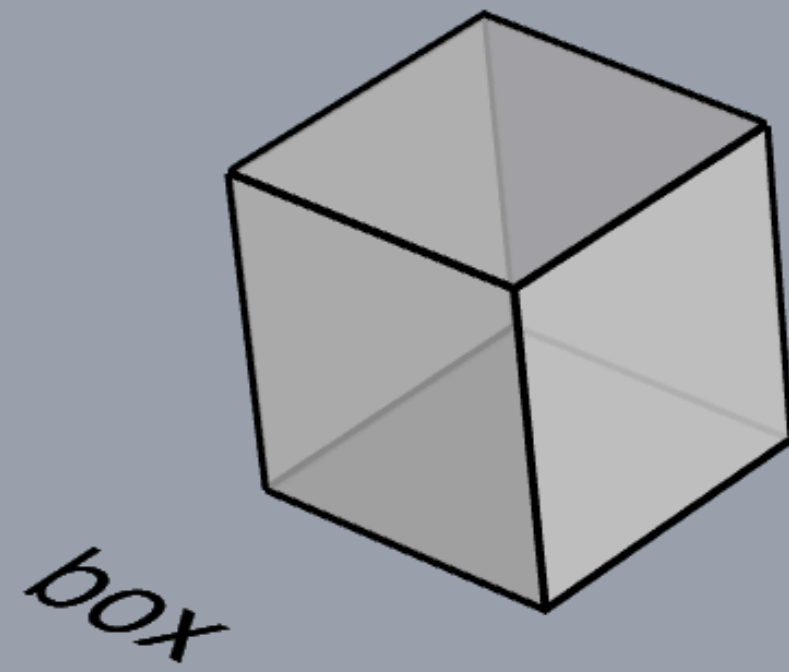
rotate: circle segment handles

extrude: click arrow handle > drag > press command&shift

select subsurface: command&shift + selecting surface or edge

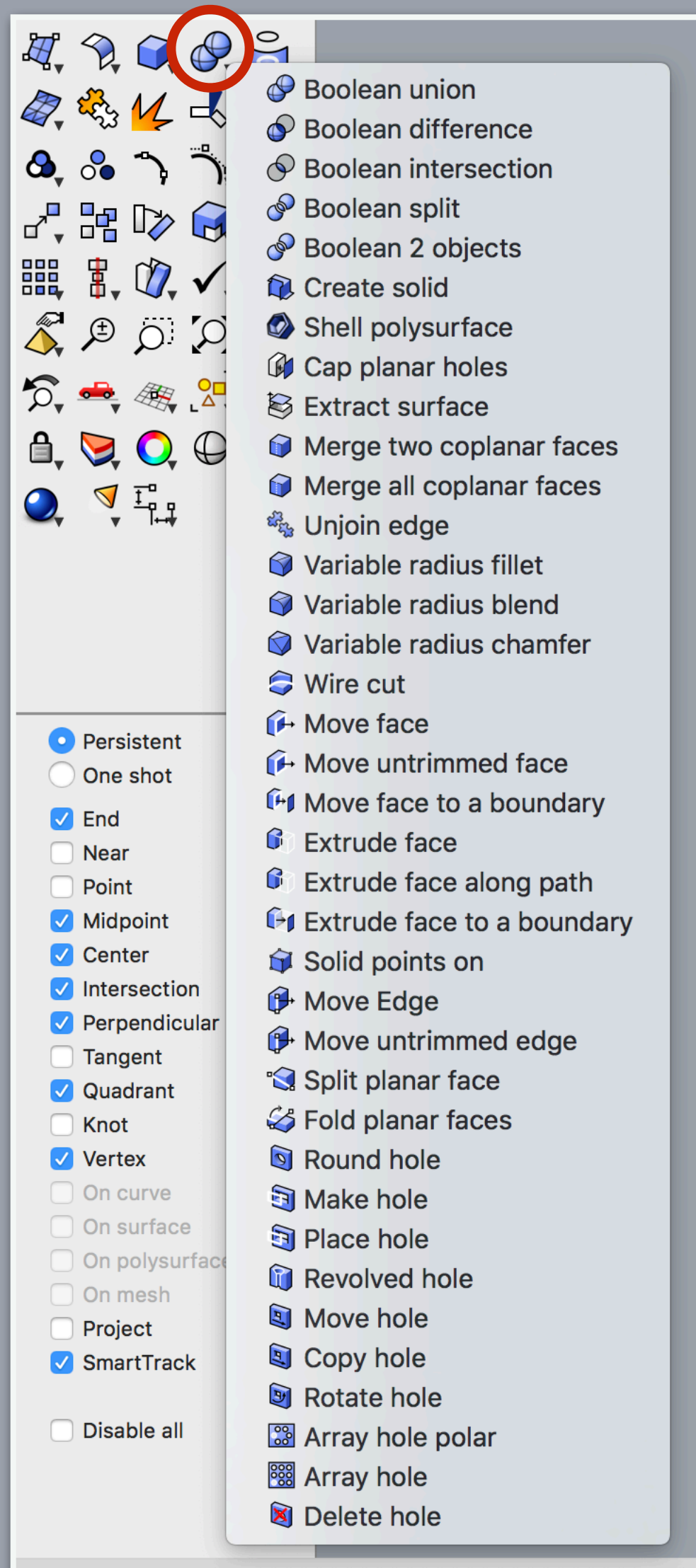
EXERCISE03

Create Solids



EXERCISE03

Edit Solids

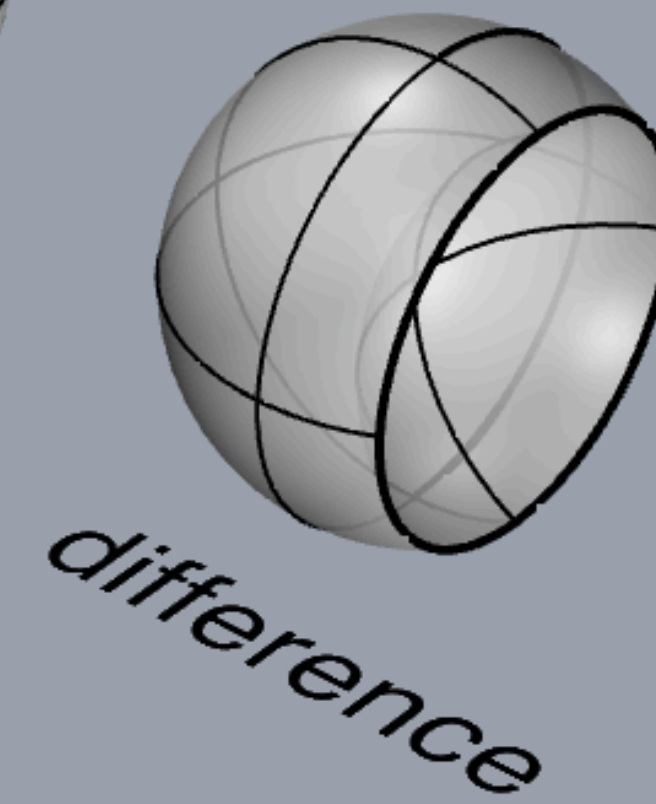
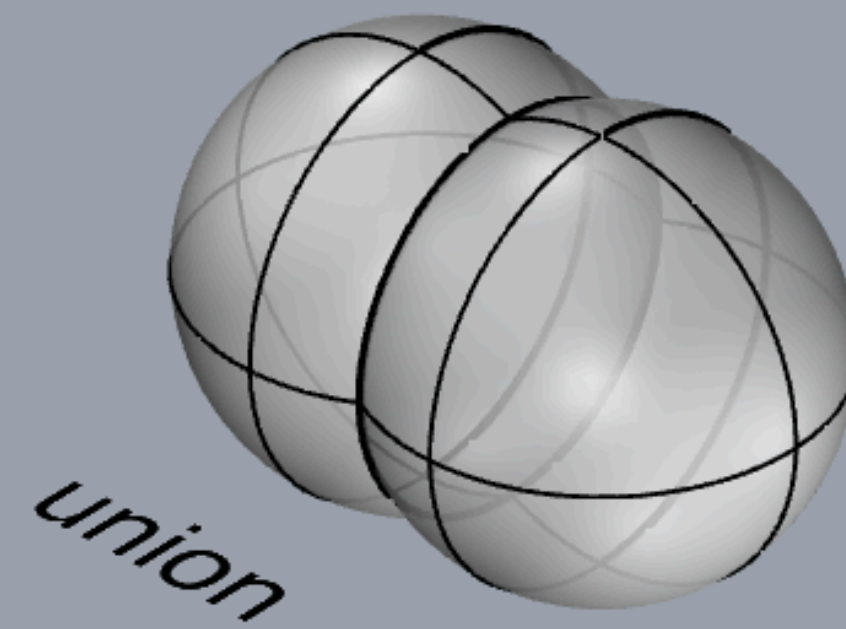


The image shows a CAD software toolbar with various icons. The Boolean operations icons are highlighted with a red circle. Below the toolbar is a list of Boolean operations and other solid editing tools.

- Boolean union
- Boolean difference
- Boolean intersection
- Boolean split
- Boolean 2 objects
- Create solid
- Shell polysurface
- Cap planar holes
- Extract surface
- Merge two coplanar faces
- Merge all coplanar faces
- Unjoin edge
- Variable radius fillet
- Variable radius blend
- Variable radius chamfer
- Wire cut
- Move face
- Move untrimmed face
- Move face to a boundary
- Extrude face
- Extrude face along path
- Extrude face to a boundary
- Solid points on
- Move Edge
- Move untrimmed edge
- Split planar face
- Fold planar faces
- Round hole
- Make hole
- Place hole
- Revolved hole
- Move hole
- Copy hole
- Rotate hole
- Array hole polar
- Array hole
- Delete hole

Options:

- Persistent
- One shot
- End
- Near
- Point
- Midpoint
- Center
- Intersection
- Perpendicular
- Tangent
- Quadrant
- Knot
- Vertex
- On curve
- On surface
- On polysurface
- On mesh
- Project
- SmartTrack
- Disable all



EXERCISE04

CV Curve Creation and Editing

_curve

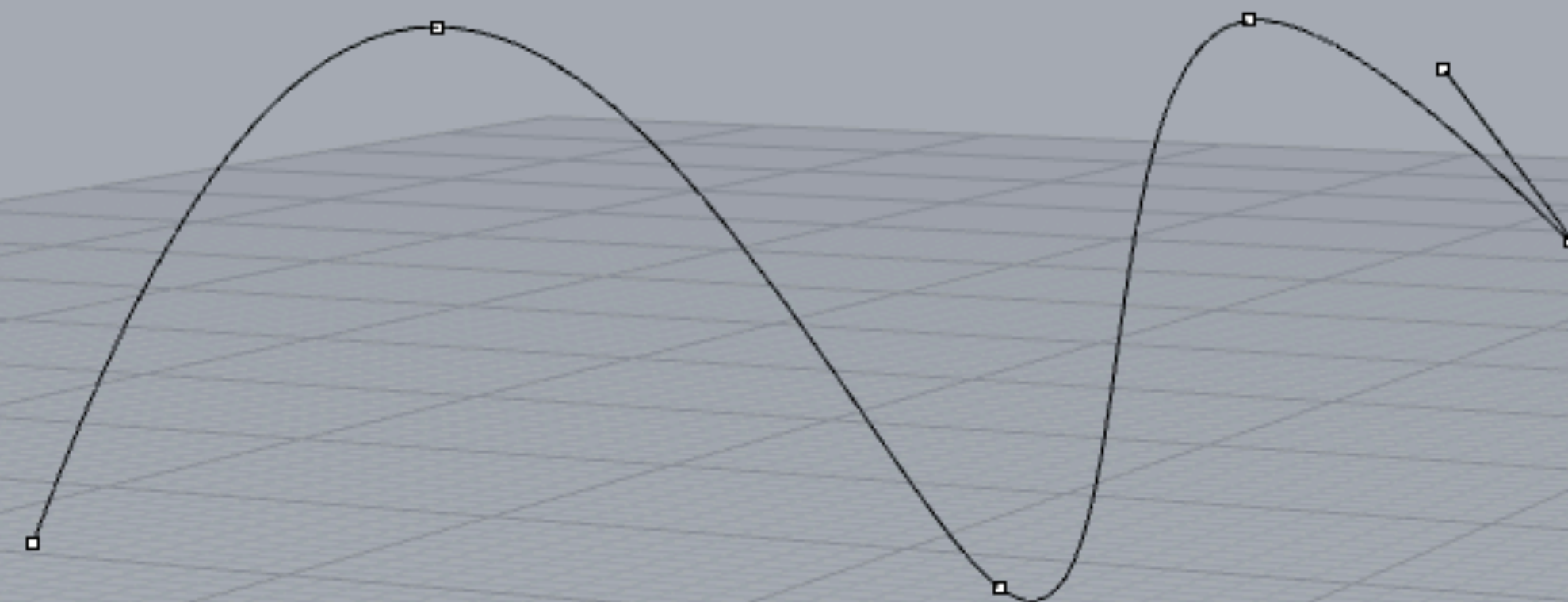
_move / _mirror / _trim / _extend

_EditPtOn

Use Osnap / Objektfang

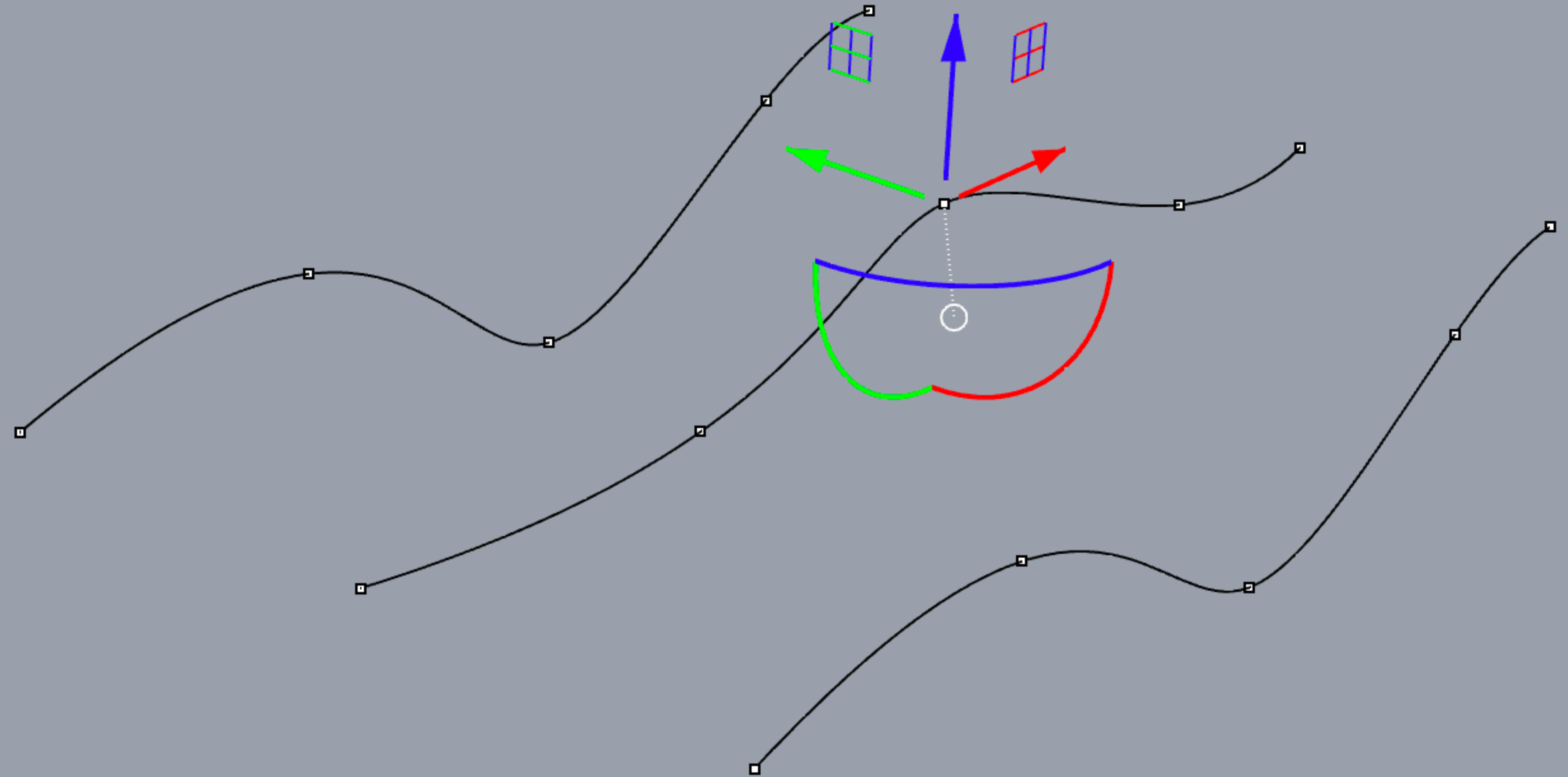
Use Gridsnap / Rasterfang

Use gumball to edit and move points



EXERCISE04

CV Curve Creation and Editing



_curve

_move / _mirror / _trim / _extend

_EditPtOn

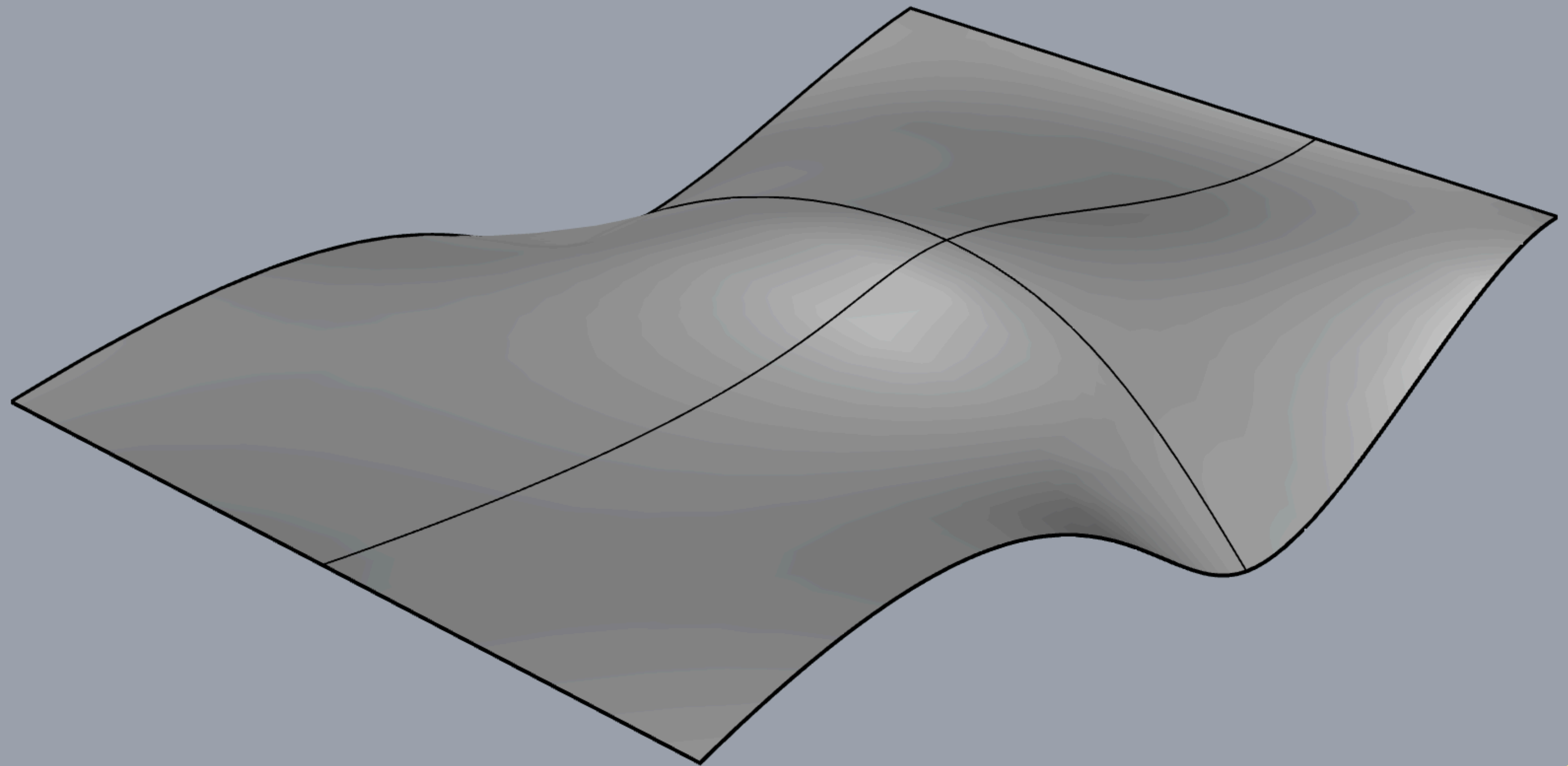
Use Osnap / Objektfang

Use Gridsnap / Rasterfang

Use gumball to edit and move points

EXERCISE03

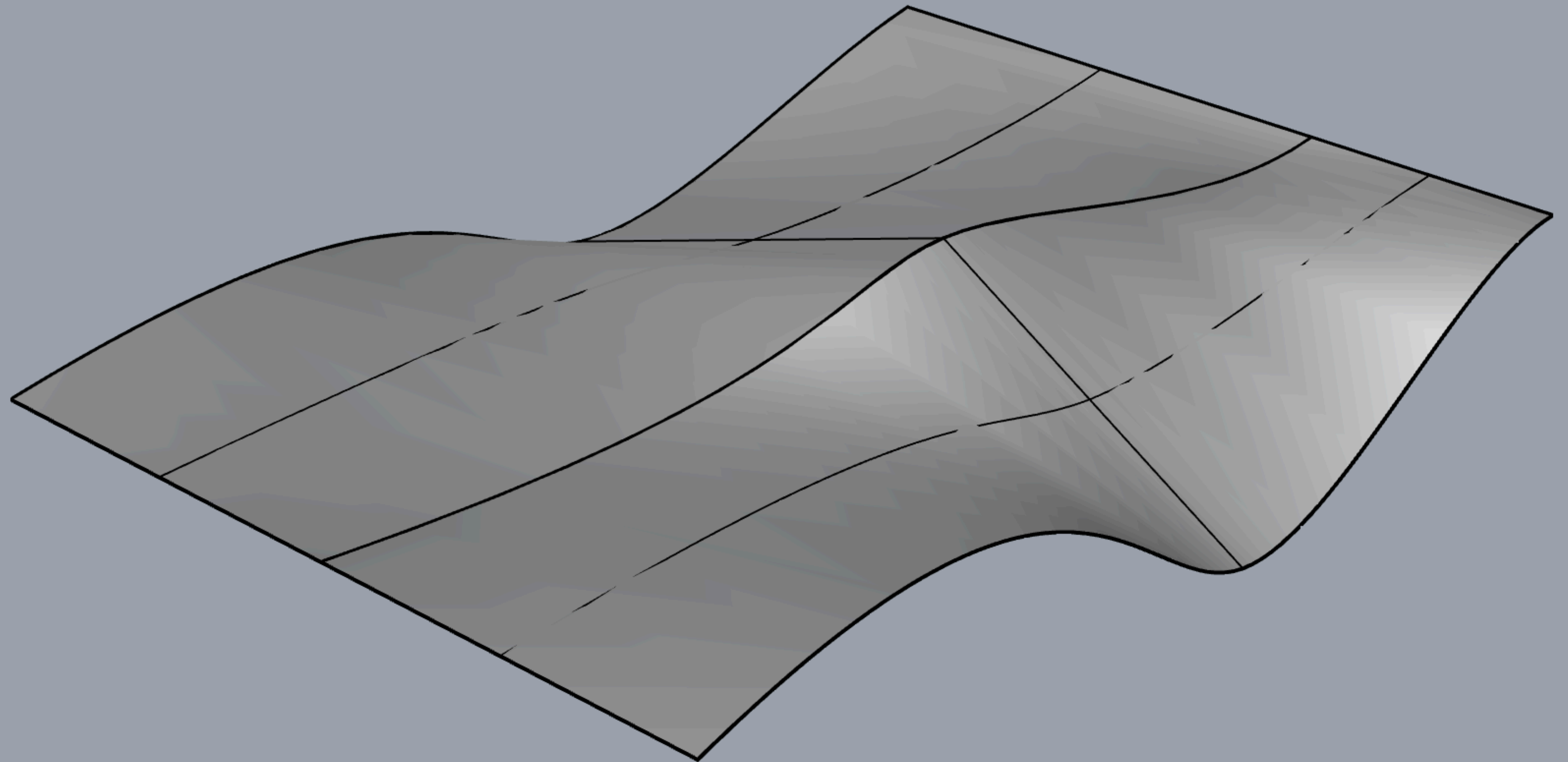
Create Surfaces - Loft



Loft > normal

EXERCISE03

Create Surfaces - Loft



Loft > straight sections

Ressources

- [Digitaltoolbox.info](#)
- [Rhino 5 Level 1 Training Guide and Models](#)
- [Download Rhino 5 WIP](#)

Thank you!

Kontakt

Florian Wille

florian.wille@zhdk.ch

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Zürcher Hochschule der Künste
Bachelor of Arts in Design