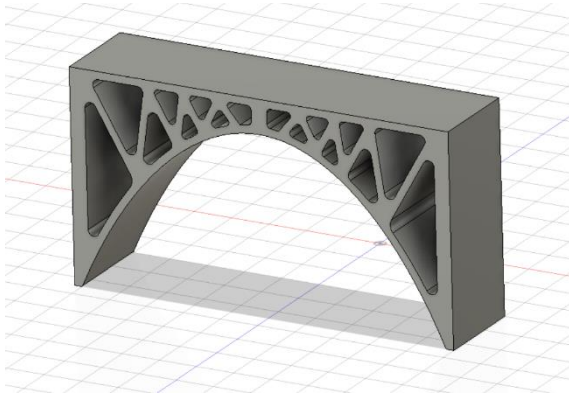


**Question 1: CAD / CGI / Rapid Prototyping**

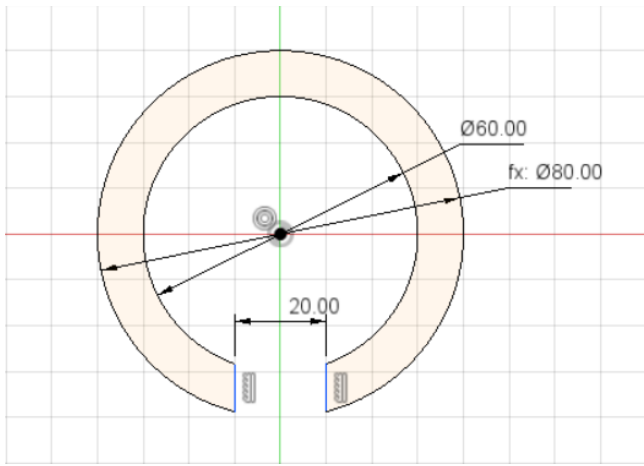
a) **(2P)** Explain: What is the definition of the term „CAD“? Where and why is it used with what purpose?



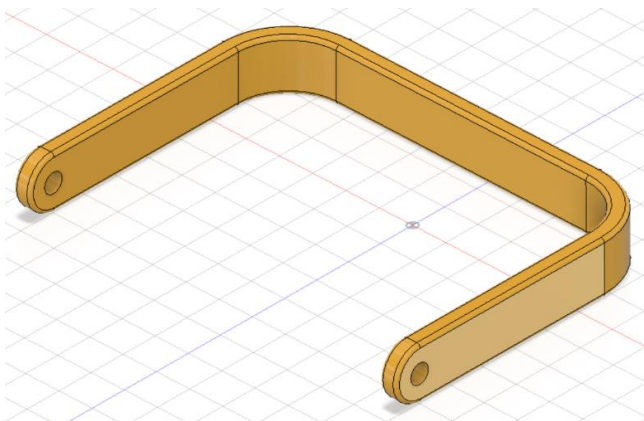
b) **(2P)** In our lessons we produced pictures out of our construction software before 3D printing. Illustrate the steps beginning from CAD to finished picture. Use the correct terms for the process steps.

c) **(3P)** We are using a software called „Fusion 360“ in our lessons (there are many other software packages). Explain the steps getting a construction. In your text use the following technical terms: *Component, Sketch, Extrusion, Dimension, Constraint, Construction plane*.

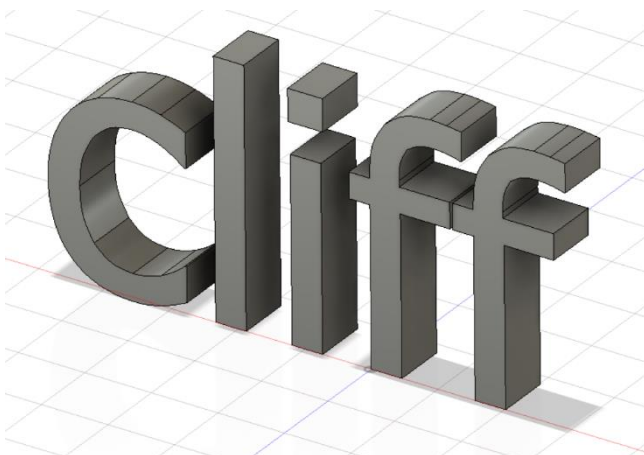
d) How would you prepare the following objects using construction software? Explain the necessary steps:



(2P)



(2P)



### Question 2: 3D printing objects

This lettering needs to be printed as you can see it here: standing upright. Describe: Where do you see difficulties in printing this object and how to fix them?

### Question 3: 3D printing

a) **(4P)** Explain the functionality of a 3D printer: How to get a printed 3D model from CAD data? In your text use the technical terms

- (1) „Filament“      (2) „Printing temperature“      (3) „Glass transition temperature“  
(4) „Layer height“      (5) „Infill“      (6) „Slicing“

b) **(3P)** Here's a model of a 3D printer. Label and describe the different functional units of the printer:

- (1) Stepper motors (how many?)      (2) Nozzle      (3) Hot End  
(4) Extruder (Bowden or Direct?)      (5) Print bed      (6) drive gear

