Field of education:
Mechanical engineering

Professional qualification:
CNC operator

Exercise:
Programming of CNC machine

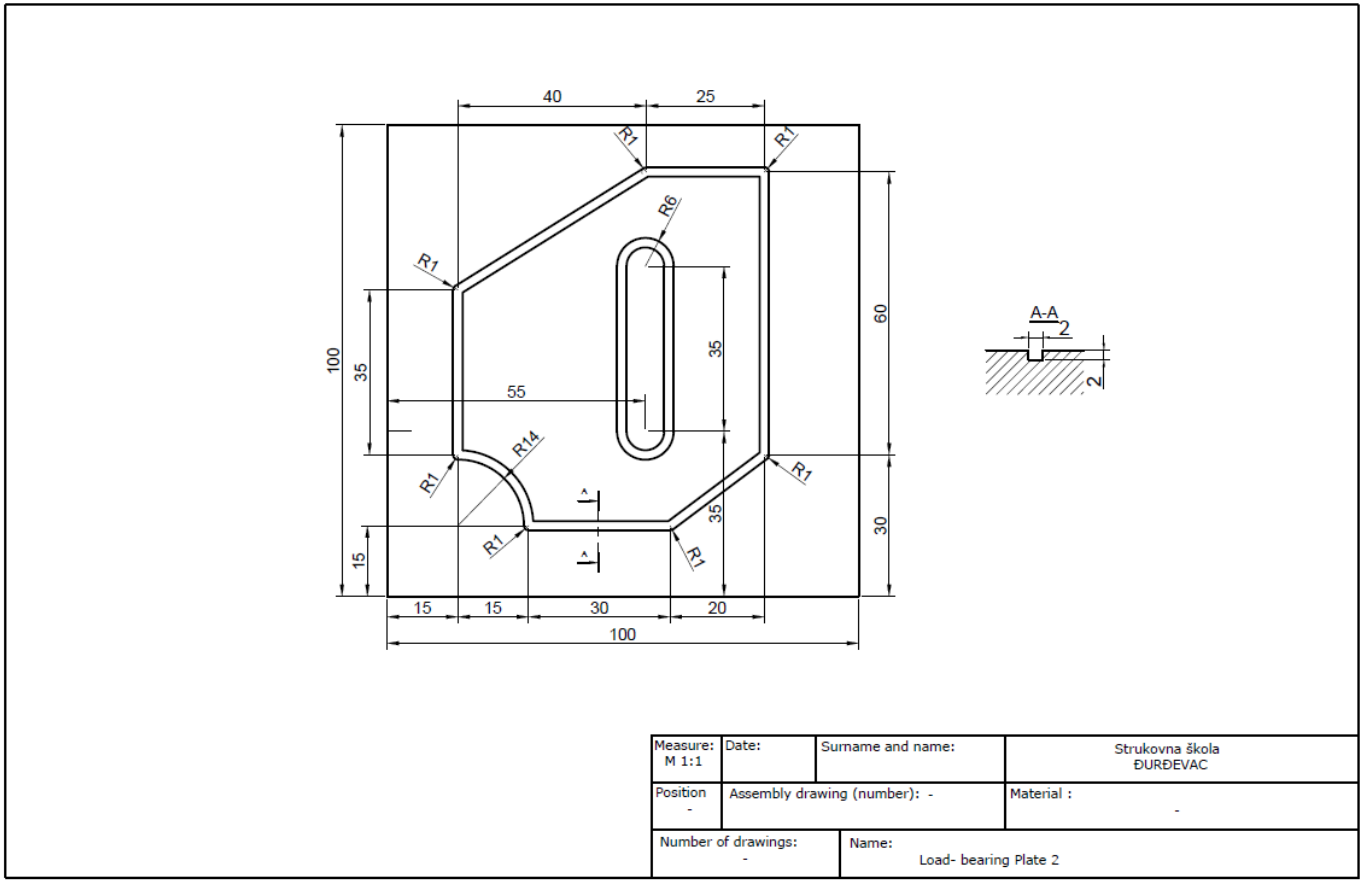
Variant:
Task 21 – Support plate 2.1.

Strukovna škola Đurđevac | Dr. Ivana Kranjčeva 5, 48350 Đurđevac
Tel.: +385 48 812 223 | E-mail: ured@ss-strukovna-djurdjevac.skole.hr
Web: ss-strukovna-djurdjevac.skole.hr

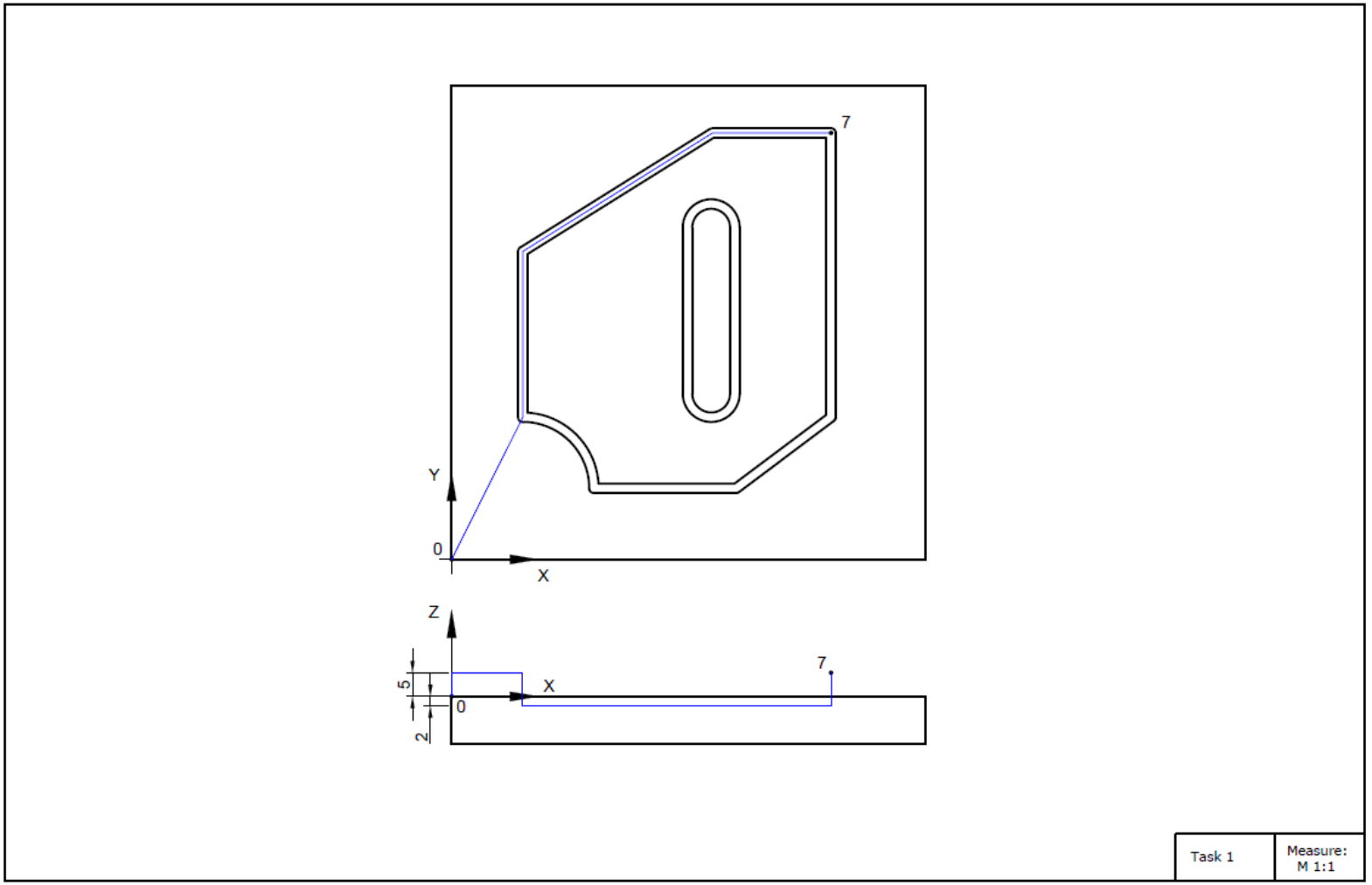
Instructions for exercise:

According to the given workshop drawing make the following tasks:

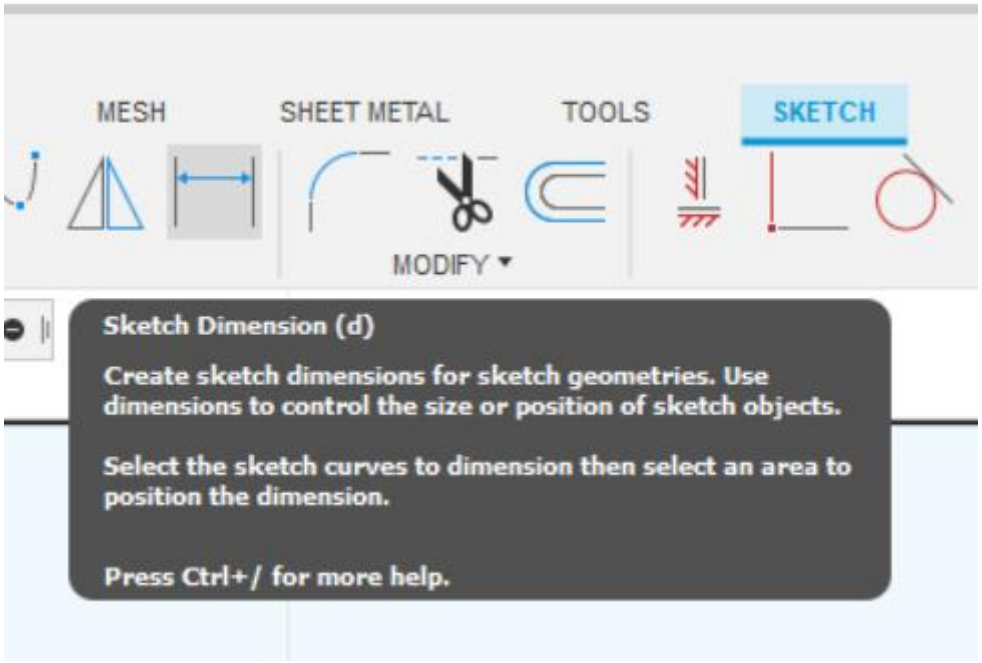
- Draw the appearance of the 3D model in Fusion 360.



- According to the given path and the given start or end point (blue line), determine the other necessary points.



- To make it easier to determine the coordinates, use Sketch Dimension option in the drawn sketch for precise G-code writing.



- Consider the position of your coordinate system.
- Write a G-code.
- Tighten the workpiece on the machine.
- Set the coordinate system on the machine (reset all coordinates to 0).
- Load the program into the machine control unit.
- Move the machine via the control unit to perform operations.

Brief description of commands in G-code:

- G0 - fast pace, straight movement, when we are not in contact with the object of processing

  The command for programming the high-speed movement is modal, and the form of programming is:

  G0 X ... Y ... Z ... - in a rectangular coordinate system,

  where X, Y, Z are the coordinates of the point which the tool should reach.

- G1 - working stroke, straight movement, when processing the object

  It is used for processing, i.e. we enter the material with a tool. The tool moves in a straight line with an offset which is specified before or in the block with the G1 command. The command is modal. Form of programming in a rectangular coordinate system is:

  G1 X ... Y ... Z ...

  where X, Y, Z are the coordinates of the point to which the tool should reach.

- G2 - circular clockwise movement

- G3 - circular motion counterclockwise

- In addition to linear interpolation, the control unit also allows circular interpolation. The first piece of information is the point where the tool is currently located, and that is the starting point of circular arc. The other two data are a logical combination of the following data:

  X, Y, Z - coordinates of the end point of the circular arc,

  R - radius of a circular arc, or

  I, J, K - coordinates of the center of the circular arc