

XI'AN JIAOTONG-LIVERPOOL UNIVERSITY

西 交 利 物 浦 大 学

COURSEWORK SUBMISSION COVER SHEET

Name	Yilun.Zhang (Surname)	(Other Names)
Student Number	2251482	
Programme	MEC106 Final Project	
Module Title	Engineering drawing	
Module Code	MEC106	
Assignment Title	Orthographic Drawing (Multiview Drawing) for Engineering Solids & Isometric Sketching from Orthographic Views	
Submission Deadline	5/28/2024	
Module Leader	Yan Yan	

By uploading or submitting this coursework submission cover sheet, I certify the following :

- I have read and understood the definitions of PLAGIARISM, COLLUSION, and the FABRICATION OF DATA, as outlined in the Undergraduate Student Handbook of Xi'an Jiaotong-Liverpool University and as posted on the University Website.
- This work is my own, original work produced specifically for this assignment. It does not misrepresent the work of another person or institution as my own.
Additionally, it is a submission that has not been previously published, or submitted to another module.
- This work is not the product of unauthorized collaboration between myself and others.
- This work is free of embellished or fabricated data.

I understand that PLAGIARISM, COLLUSION and the FABRICATION OF DATA are serious disciplinary offences. By uploading or submitting this cover sheet, I acknowledge that I am subject to disciplinary action if I am found to have committed such acts.

Signature Yilun.Zhang 张逸伦

Date 24/5/2024

For Academic Office use:	Date Received	Days Late	Penalty

Feedback on the strength of the work

Feedback on the weakness that needs to be improved

1st Marker_____ **Date**_____ **Mark**_____

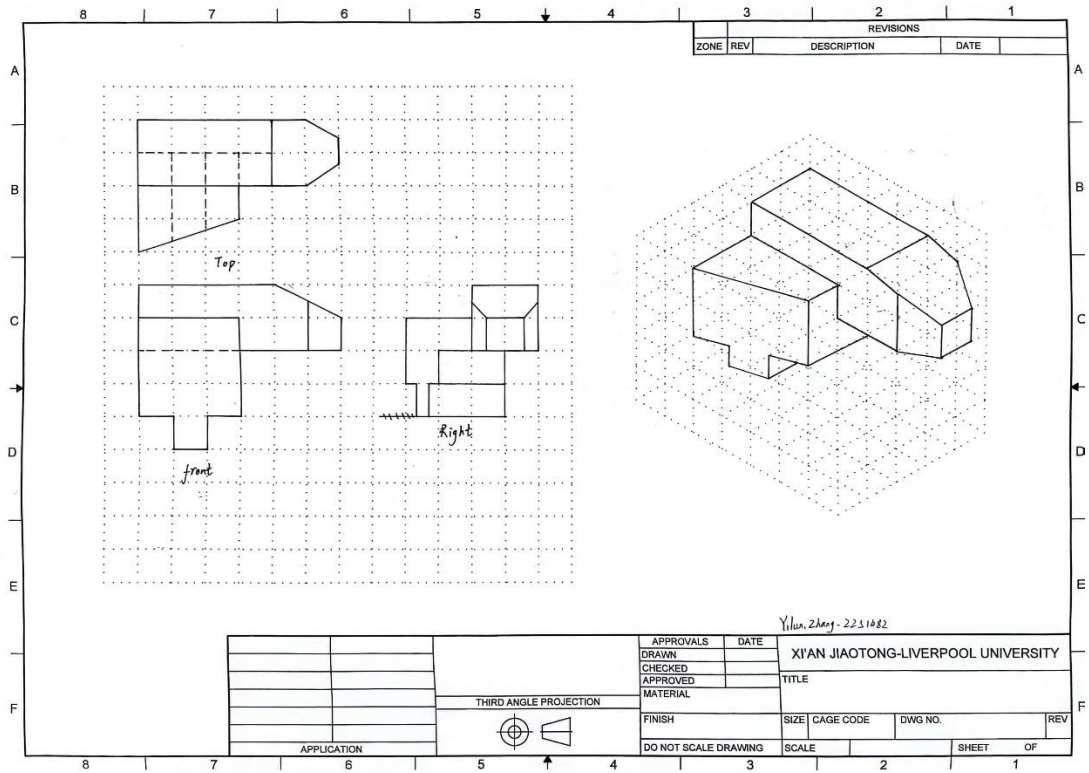
2nd Marker_____ **Date**_____ **Mark**_____
(if applicable)

Students: Please start your assignment on the next page.

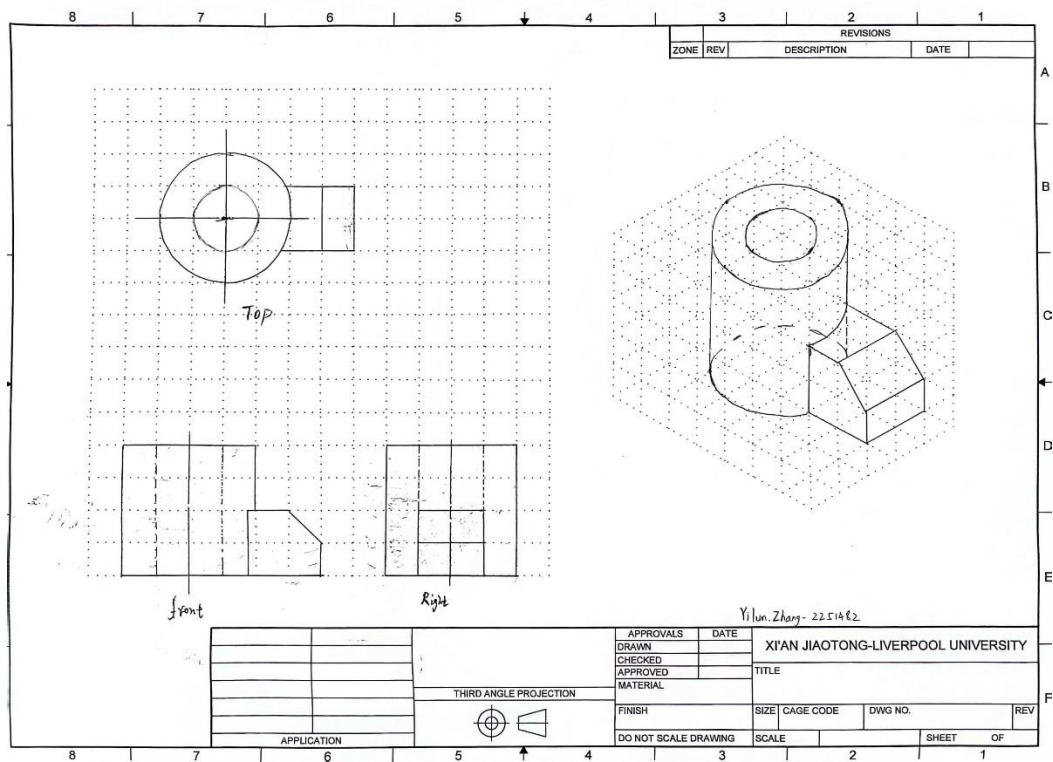
Look the orthographic view. And use hand drawing to present the engineering drawing of the 3 components, including isometric sketch and multiviews.

[illegible]

3



Part (C):



Benefits of Isometric Sketch:

- 1) **Accuracy in Proportion:** Isometric sketches maintain accurate proportions, making it easier to visualize the dimensions of the object.
- 2) **Ease of Measurement:** Measurements can be easily taken directly from the sketch because the scale is uniform along all three axes.
- 3) **Comprehensive View:** Provides a clear representation of all three dimensions (height, width, depth) of the object, making it useful for technical and engineering purposes.
- 4) **Efficiency:** Relatively simple to create and interpret, making them useful for quick design iterations and communication among designers and engineers.

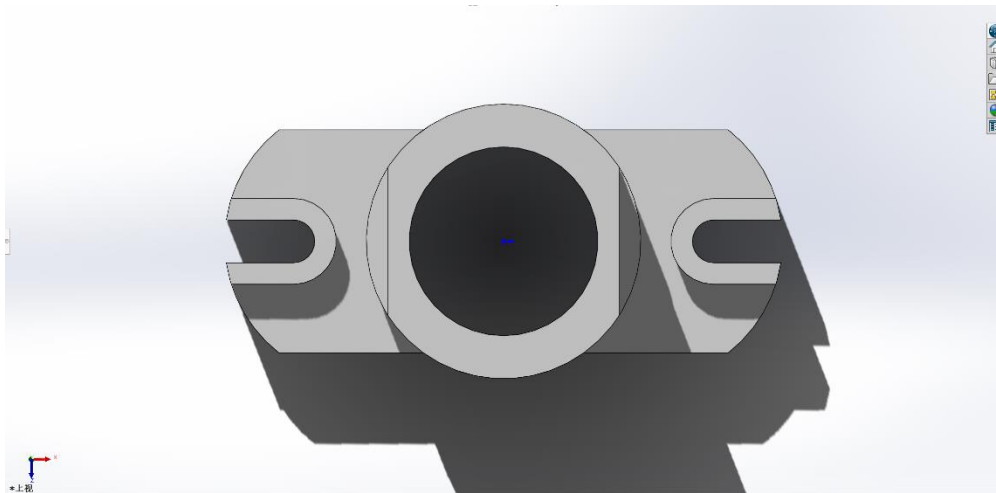
Comparison of Isometric Sketch and Oblique Sketch:

Feature	Isometric Sketch	Oblique Sketch
Projection Angles	All three axes are at 120° to each other.	Front face is drawn true to shape, with receding axes typically at 30° or 45° .
Complexity	More complex to draw due to the need to maintain equal angles.	Easier to draw front face; receding angles can be simpler.
Ease of Measurement	Measurements are accurate along the axes.	Measurements are accurate only on the front face.

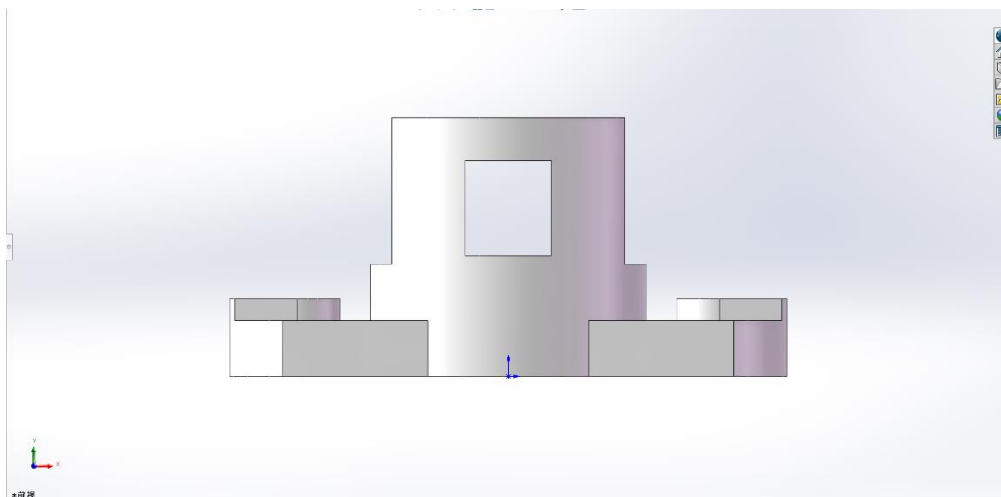
Section B:

- **3D modeling of the objects:**

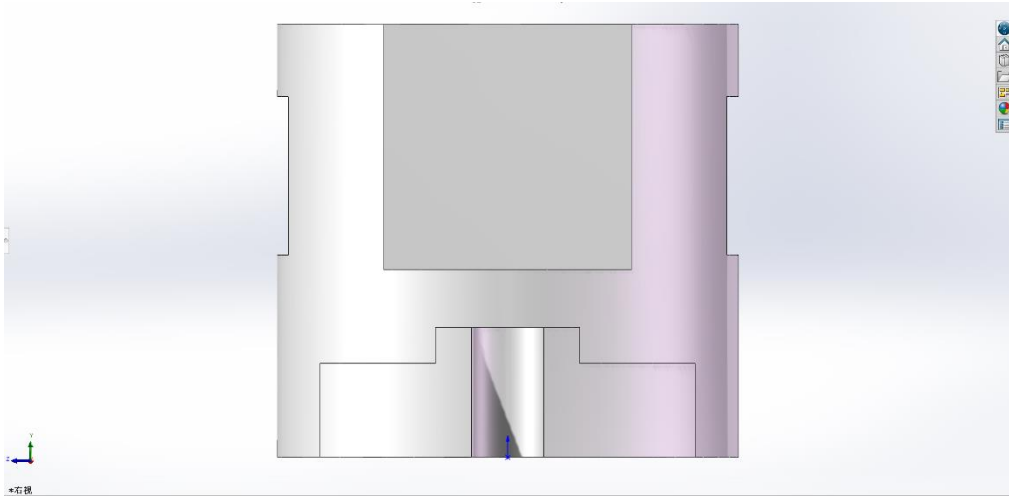
B1 Top view:



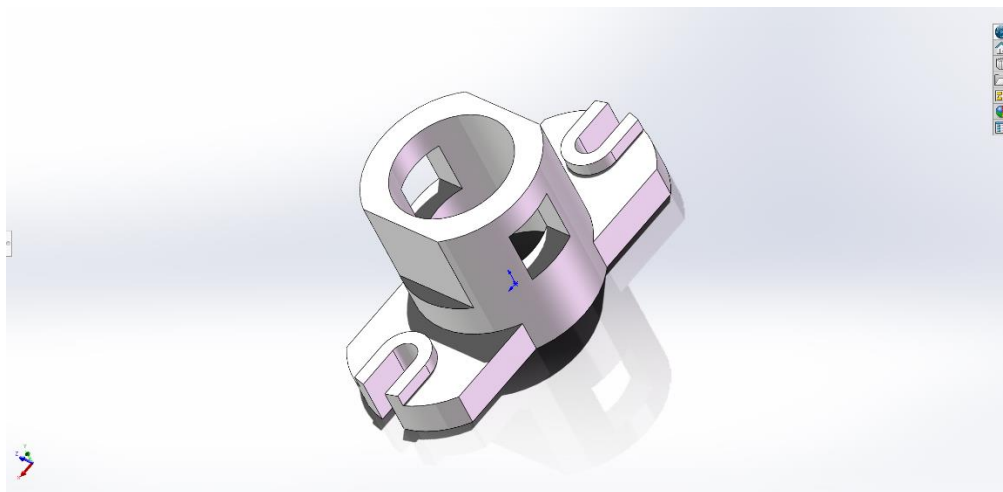
B1 Front view:



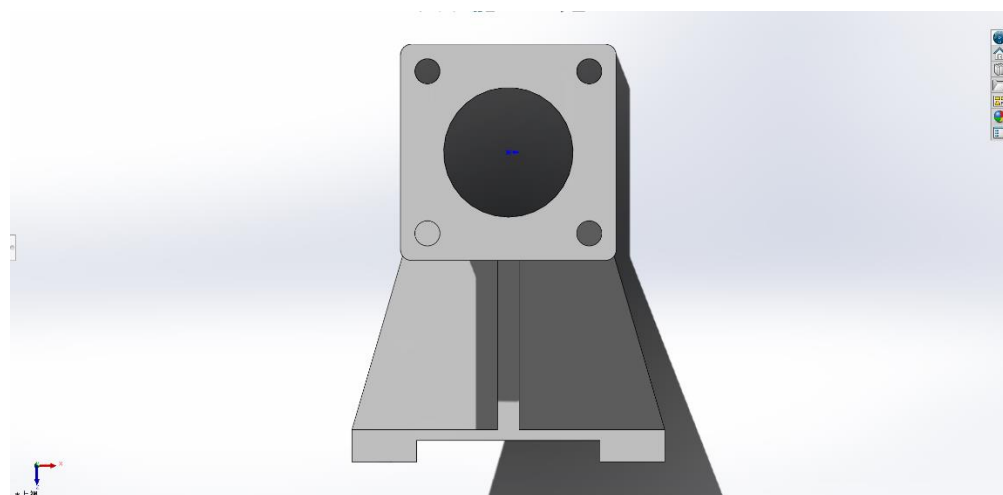
B1 Right side view:



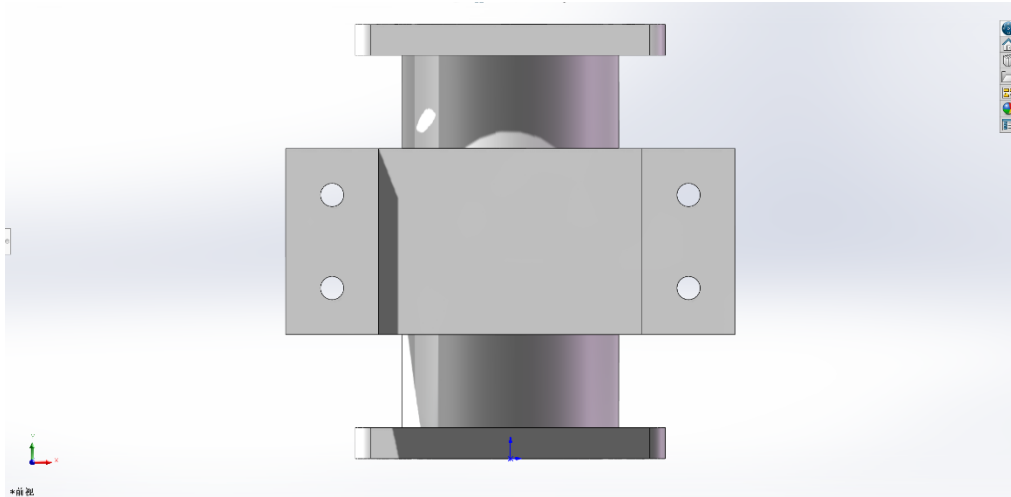
B1 Diagonal square angle:



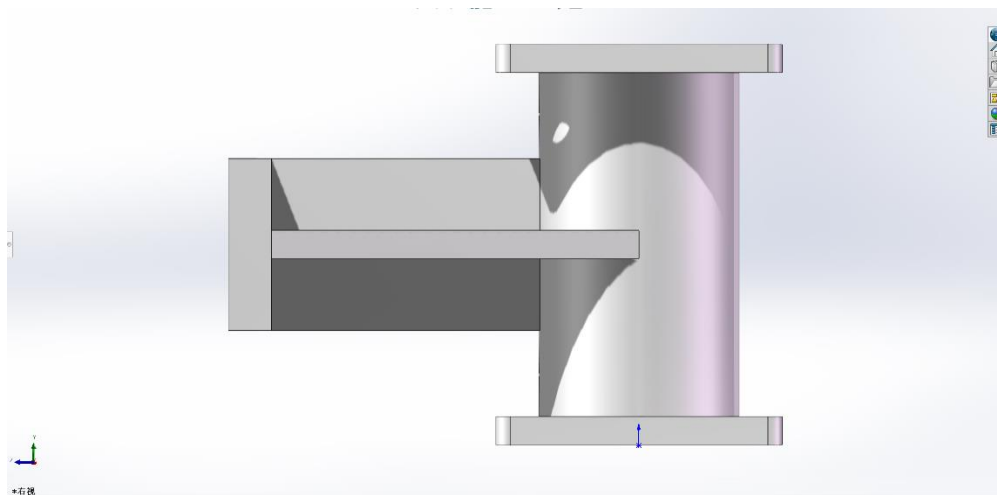
B2 Top view:



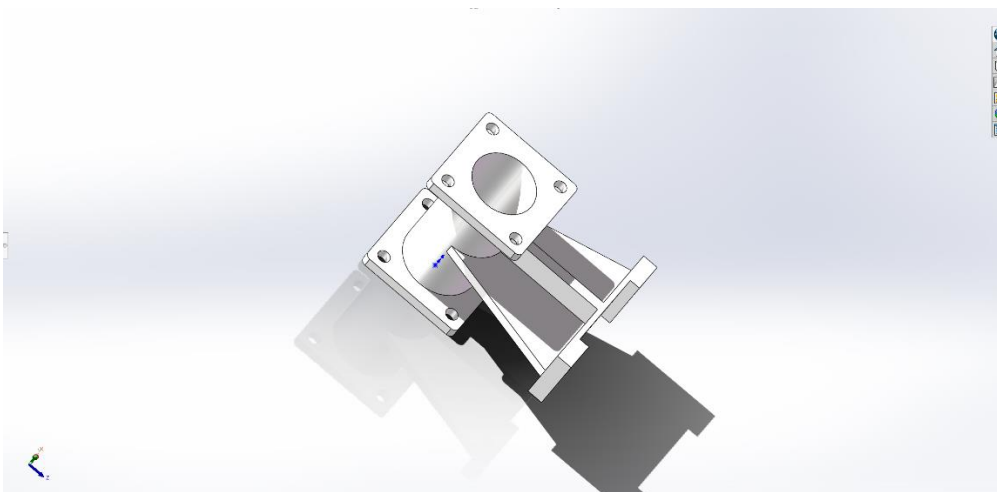
B2 Front view:



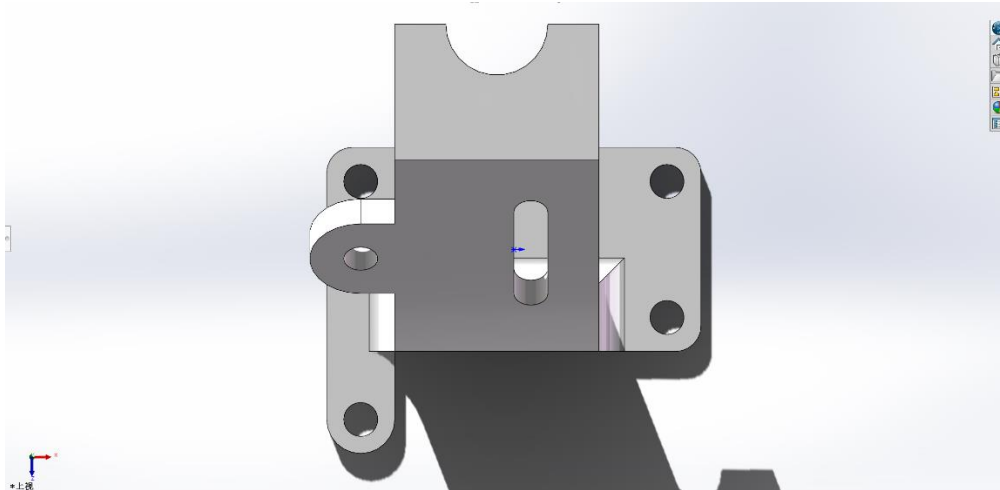
B2 Right side view:



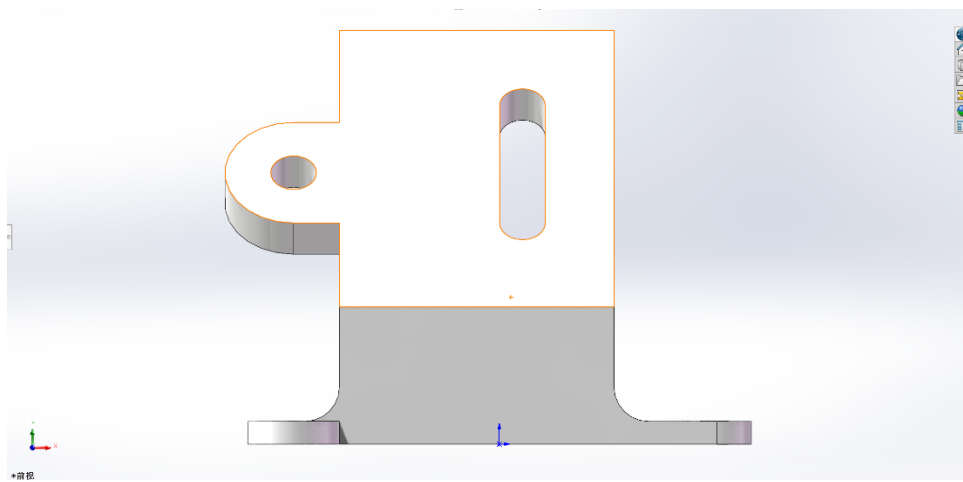
B2 Diagonal square angle:



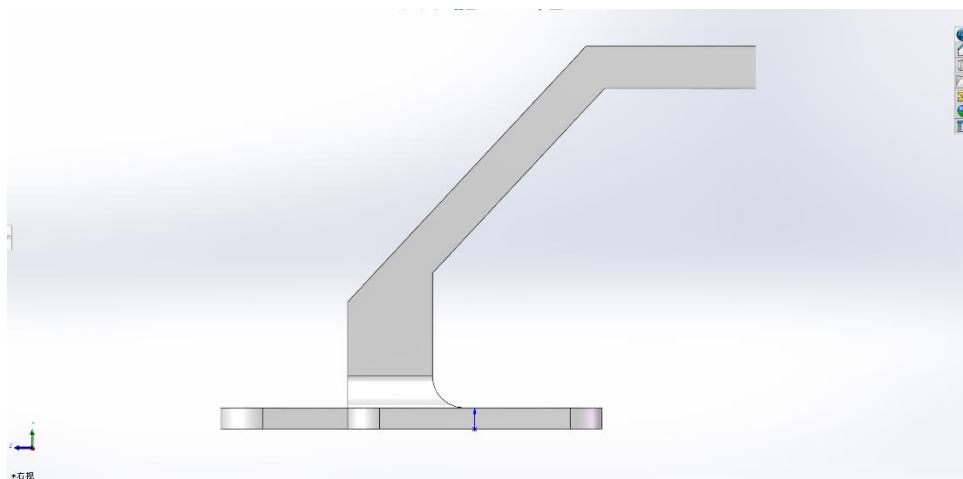
B3 Top view:



B3 Front view:



B3 Right side view:

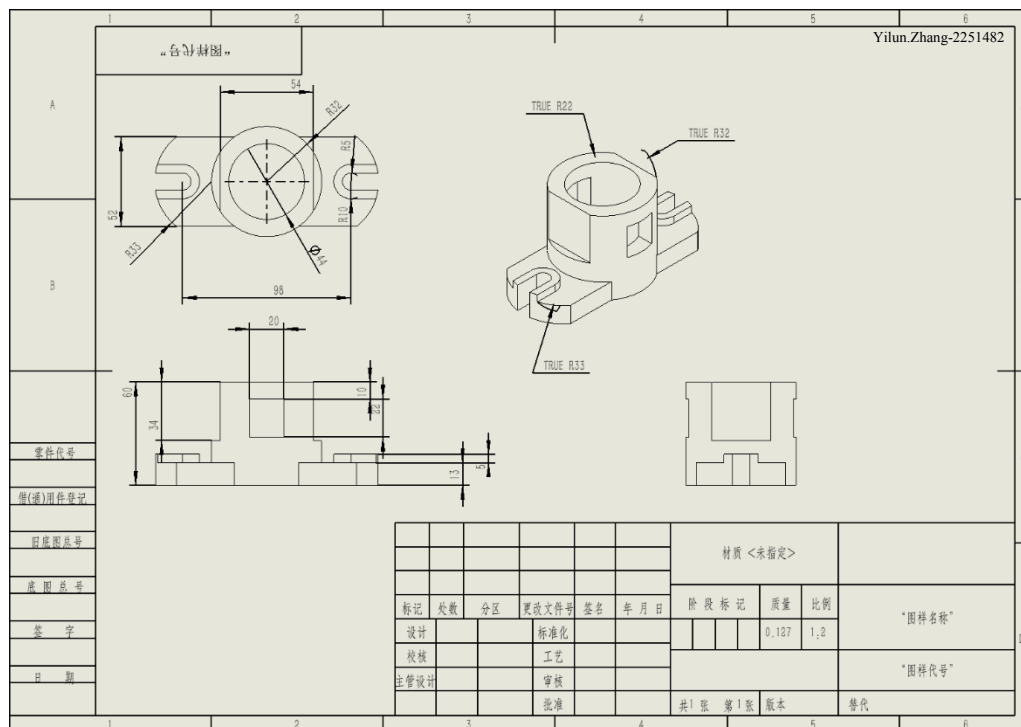


B3 Diagonal square angle:



● Designs in Multiview Drawing:

B1:



B2:

- 2) Precision: Ensures precise communication of dimensions and geometry, which is crucial for manufacturing and engineering.
- 3) Clarity: Eliminates ambiguity by showing different aspects of the object separately, making it easier to understand complex parts.
- 4) Standardization: Follows standardized conventions, making it universally understandable among engineers and manufacturers.

Comparison of multiview drawing, pictorial drawing and perspective drawing:

Multi-view diagrams are essential to provide a detailed, accurate representation of an object from multiple perspectives and are an integral part of the technical field. In contrast, paintings and perspectives provide single-view representations with varying degrees of distortion and are commonly used for visualization and artistic purposes

Computer-Aided Design (CAD) Applications:

CAD software is an important tool in modern engineering, architecture and design. It allows the creation, modification, analysis and optimization of designs with high accuracy and efficiency.

Benefits:

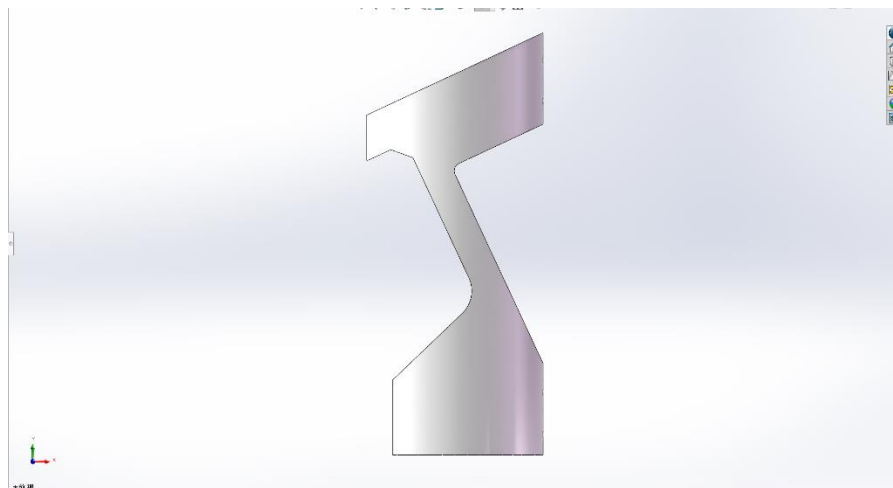
- 1) Accuracy and Precision: CAD software provides tools for creating highly accurate and precise drawings, essential for detailed engineering and architectural plans.

- 2) Efficiency: Automates many tasks that would be time-consuming by hand, such as creating repetitive components or adjusting dimensions.
- 3) 3D Modeling: Allows for the creation of 3D models, providing a realistic view of the final product and enabling virtual testing of design concepts.
- 4) Documentation: Generates comprehensive documentation, including detailed drawings, bills of materials, and manufacturing instructions.
- 5) Simulation and Analysis: Includes tools for simulating real-world conditions, analyzing stress, thermal properties, and other critical factors in the design process.

Section C:

● 3D modeling of the objects:

Front view:



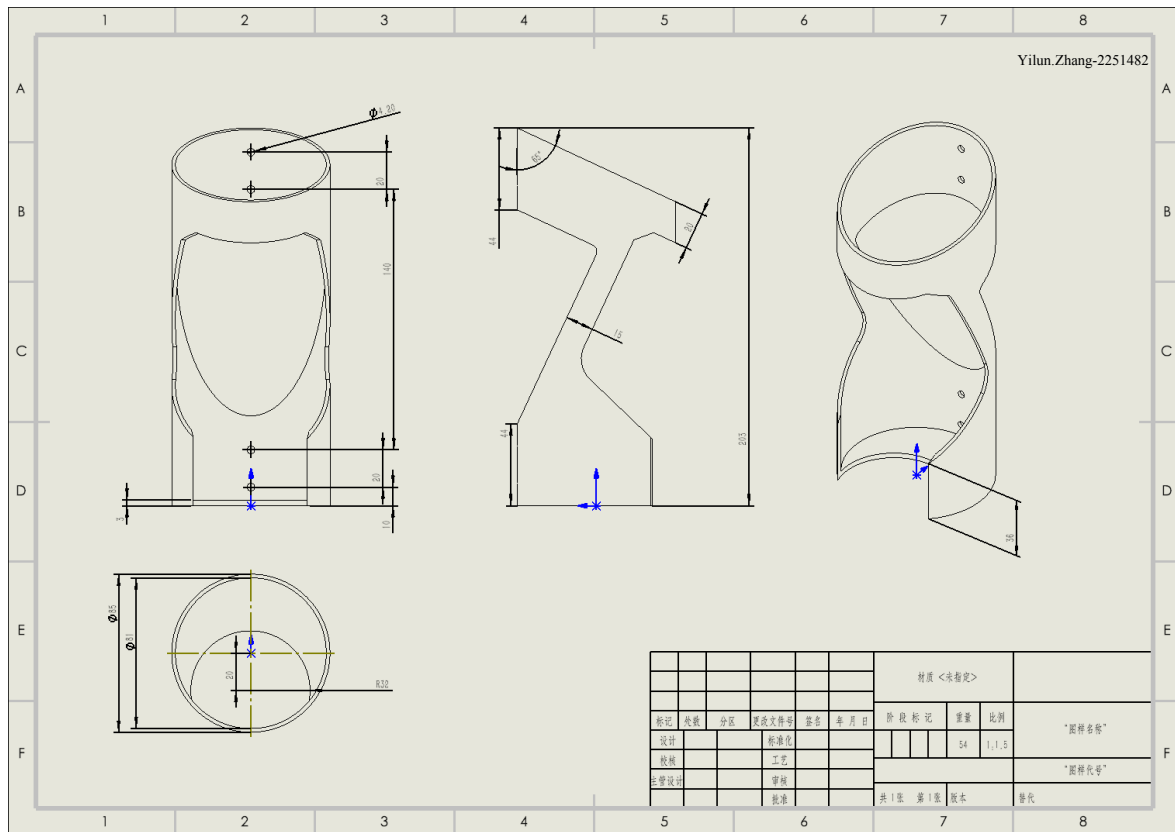
Right side view:



Diagonal square angle:



- **Designs in Multiview Drawing:**



Material selection:

I choose aluminum alloy as the material of the cup holder:

- 1) Lightweight and strong: aluminum alloy is more lightweight than steel, and its structural strength is also high. But also in line with the needs of bicycles to light.
- 2) Beautiful appearance: aluminum alloy appearance smooth, bright color. After polishing, the appearance can be improved to increase the aesthetics of the product.
- 3) Corrosion resistance: aluminum alloy surface with oxide film, not easy to be damaged by liquid corrosion.

Specific structure:

- 1) Most water bottles are cylinders, so they generally adopt the shape of a cylinder to accommodate a wider variety of water bottles.

- 2) Adopt four holes and frame fixed, more stable.
- 3) The large area of hollow and circular design is adopted to reduce the weight and ensure the stability of the water bottle in the support.
- 4) A moderate diameter of 8.5cm and height of 20cm fits most mineral water bottles and sports water bottles.

Conclusion:

This is a lightweight, simple bicycle water bottle holder that fits well with most water bottles and guarantees stability. It also has certain competitive advantages compared with the products on the market.