

University of Southern Queensland

Faculty of Health, Engineering & Sciences

School of Engineering

Course Number: ENG1100 **Course Name:** Introduction to Engineering Design

Assessment No: 2 Oncampus ☐ ★
Online ☐ ★

This Assessment carries 400 of the 1000 marks total for this Course.

Assessment Name: Technical/Scientific Artefact 2

Examiner: Dr Byrenn Birch

Date Given: 28 July 2023

Date Due: Refer to StudyDesk

Penalty for Late Submission:
Late penalties are applied per the USQ Assessment Procedure Policy (<https://policy.usq.edu.au/documents/14749PL>)

Assignments are to be submitted electronically, using the link on your Study Desk. Marked assignments are also returned to you electronically.

You do not need a coversheet for this assignment, since it is submitted electronically.

By submitting this assignment, you agree to the following Student Declaration:

I hereby certify that no part of this assignment has been copied from any other student's work or from any other source except where due acknowledgement is made in the assignment. No part of this assignment has been written for me by any other person except where such collaboration has been authorised by the Examiner.

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Instructions

All drawing dimensions are in millimetres (mm).

Computer Aided 2D Drafting program (eg. AutoCAD) must be used for the drafting questions of this assessment. Drawings created in 3D solid modelling software are **not acceptable** and will be awarded zero marks.

All CAD drafting solutions must be drawn to suit an A3 sized drafting sheet. All drawings provided are vector graphics, so you can zoom in if features are unclear.

Convert your drawing file into a PDF file. 'Print' (print as PDF file) using the 'monochrome' (black and white) setting. Instructions are in the Setting up AutoCAD drawing environment.

Submission Requirements

Your assignment must be submitted as 7 separate files. Do not submit a zipped folder of the files. Make careful note of the format and naming convention used for each file: STUDENTLASTNAME_STUDENTID_QUESTIONNUMBER.FILEEXT

1. A PDF for Question 1
2. A *.dwg file for Question 1
3. A PDF for Question 2
4. A *.dwg file for Question 2
5. A PDF for Question 3
6. A *.dwg file for Question 3
7. A file for Question 4 which details your solution and methodology

Notes:

- The PDF file is what the marker will assess.
- The *.dwg files are **required** and may be reviewed for academic integrity purposes.
- To correctly export to PDF, follow the instructions in the *Setting up AutoCAD drawing environment guide*.

IT IS VERY IMPORTANT THAT YOU SUBMIT ALL FILES REQUESTED.

Question 1 of 4- Section and Auxiliary Views

[120 marks]

ENSURE THAT YOU SUBMIT YOUR *.DWG FILE FOR THIS DRAWING. YOUR ASSIGNMENT WILL NOT BE MARKED UNLESS THIS IS SUPPLIED.

Using AutoCAD (or 2D equivalent), draft an orthographic projection of the geometry shown in Figure 1. This drawing must contain:

1. A top view;
2. A sectional front view where the geometry is fully sliced along the plane of symmetry of the arrow-like feature;
3. A left side view as defined in Figure 1; and
4. A partial auxiliary view which shows the details of the inclined surface.

Include dimensions and submit your drawing on the complete ENG1100 title block, including a complete title block. Use an appropriate scale and plot to PDF on an A3 sheet. A 3-D fly-around is available on the course page so you can view the obscured regions of the geometry. *If you have any questions about the geometry, ASK!*

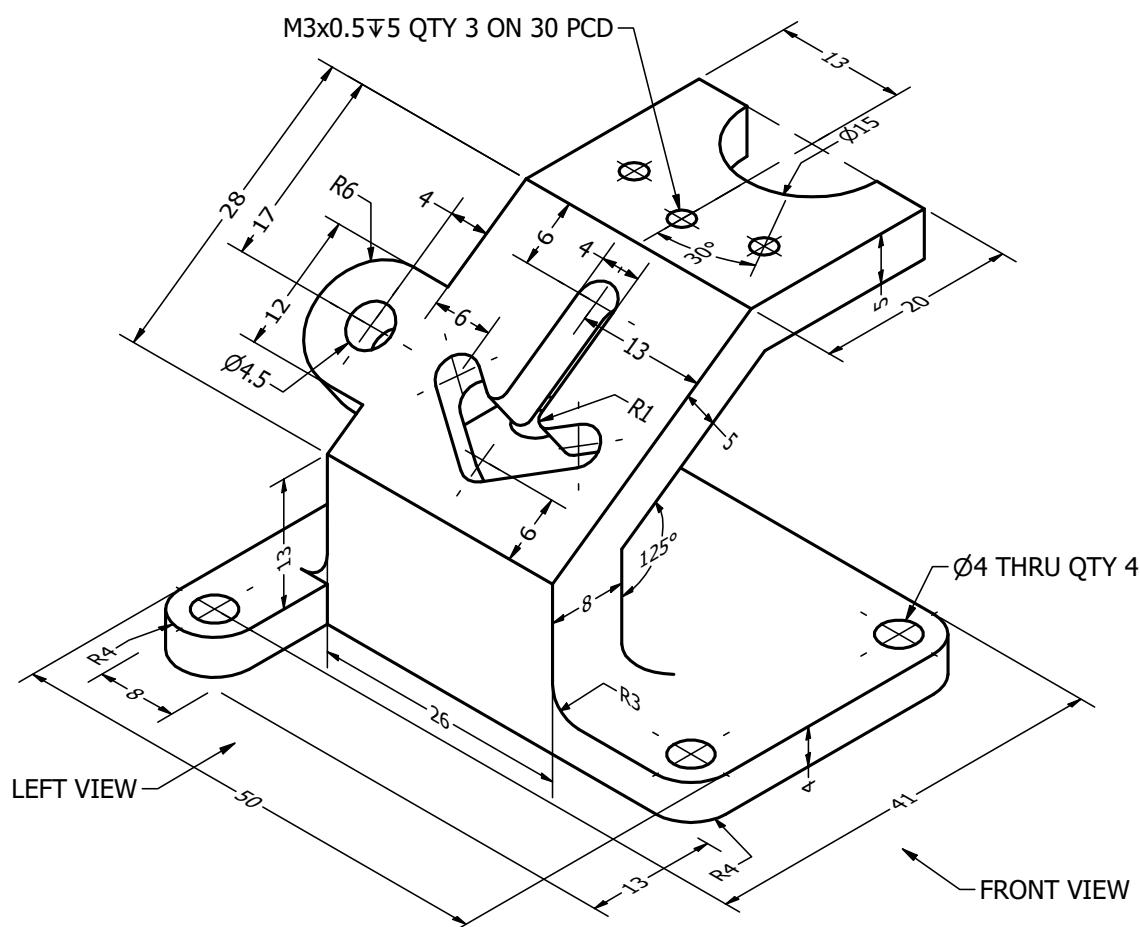


Figure 1: Question 1 geometry definition (Slide Guide & Jig).

Question 2 of 4- Pictorial Views

[70 marks]

ENSURE THAT YOU SUBMIT YOUR *.DWG FILE FOR THIS DRAWING. YOUR ASSIGNMENT WILL NOT BE MARKED UNLESS THIS IS SUPPLIED.

Using AutoCAD (or 2D equivalent), draft an isometric view of the geometry shown in Figure 2. Do not include dimensions. Submit your drawing on the complete ENG1100 title block, including a complete title block. Use an appropriate scale and plot to PDF on an A3 sheet. *If you have any questions about the geometry, ASK!*

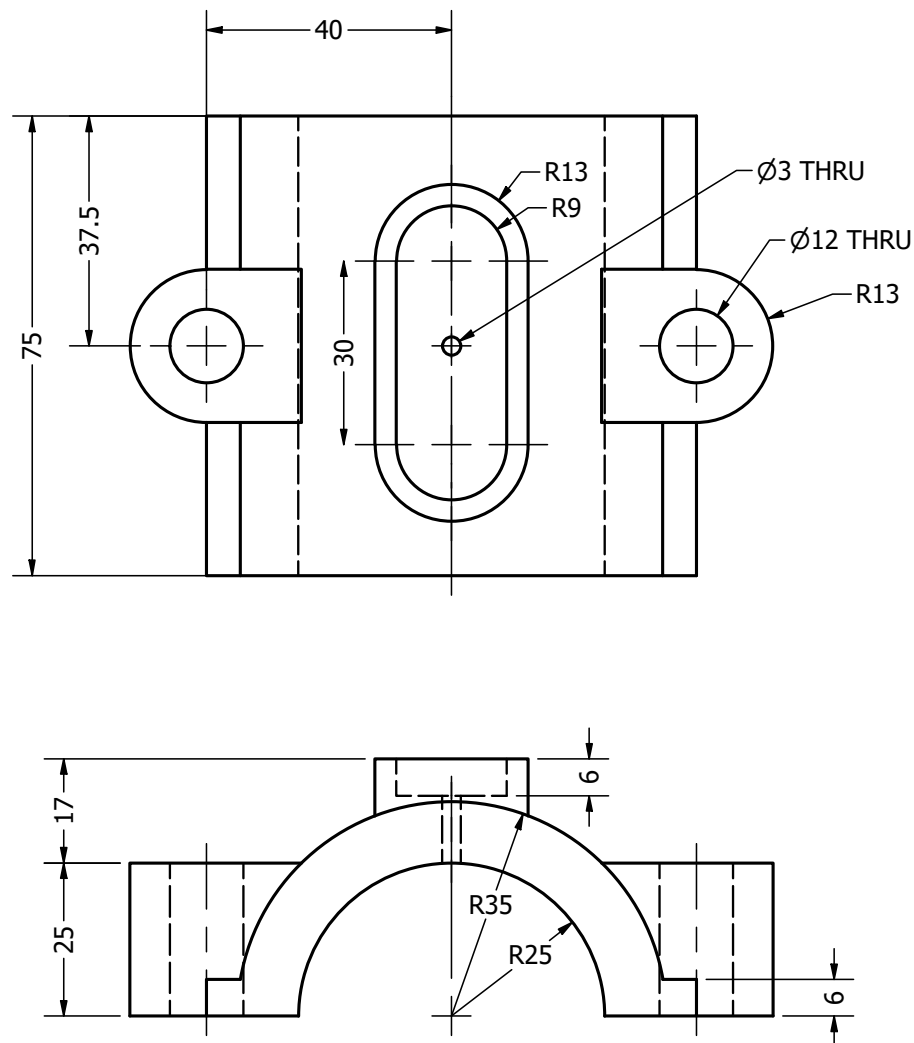


Figure 2: Question 2 geometry definition (Bearing Cap).

Question 3 of 4- Assembly Drawing

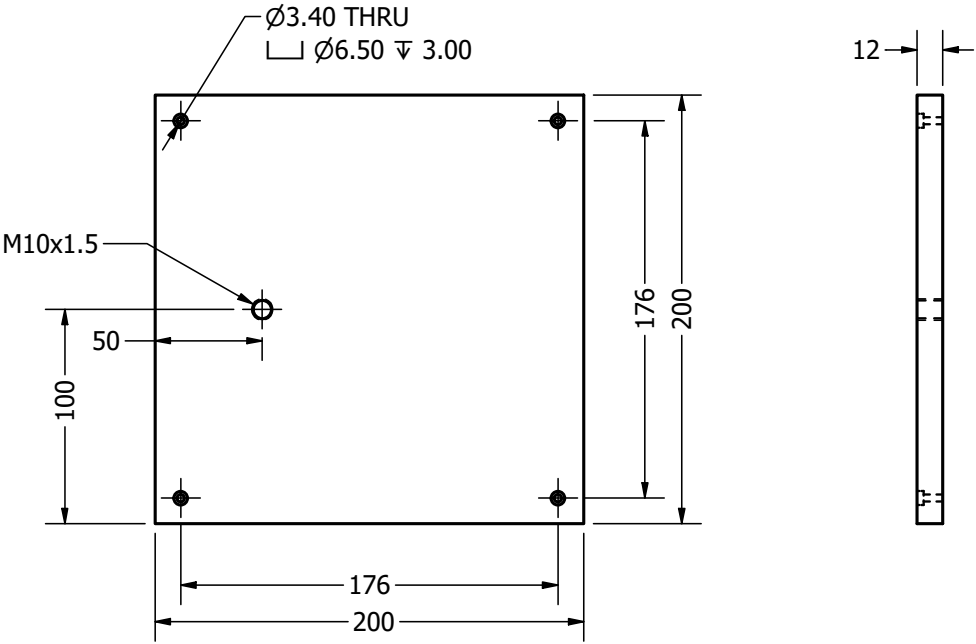
[110 marks]

ENSURE THAT YOU SUBMIT YOUR *.DWG FILE FOR THIS DRAWING. YOUR ASSIGNMENT WILL NOT BE MARKED UNLESS THIS IS SUPPLIED.

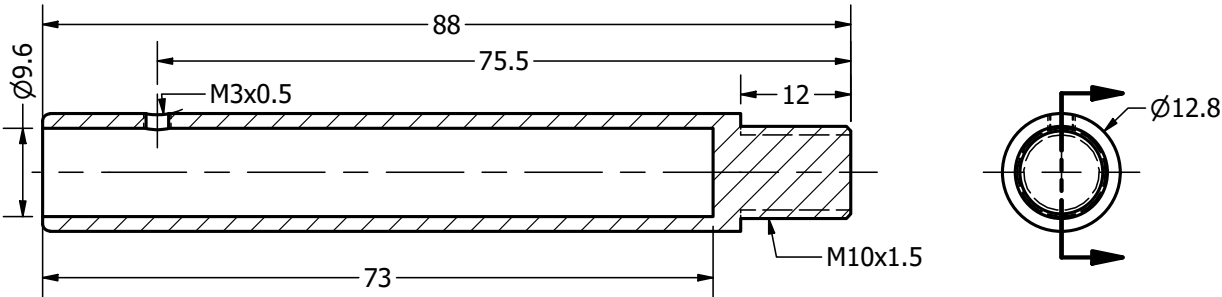
Using AutoCAD (or 2D equivalent), draft an assembly drawing of the geometry shown in Figures 3 to 5. This drawing must contain:

1. A top view;
2. A sectional front view; and
3. A right side view.

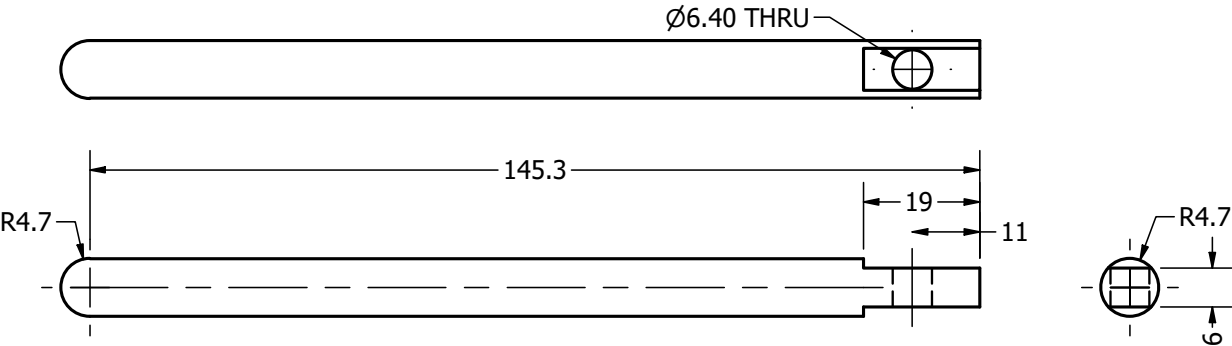
Refer to the animation on the ENG1100 2023 S2 StudyDesk for the view and sectional plane definition. Identify missing fixings which are required to complete the assembly and add these fixings to your parts list. Include dimensions and a parts list, and submit your drawing on the complete ENG1100 title block, including a complete title block. Use an appropriate scale and plot to PDF on an A3 sheet. *If you have any questions about the geometry, ASK!*



ITEM 1- PEDESTAL BASE

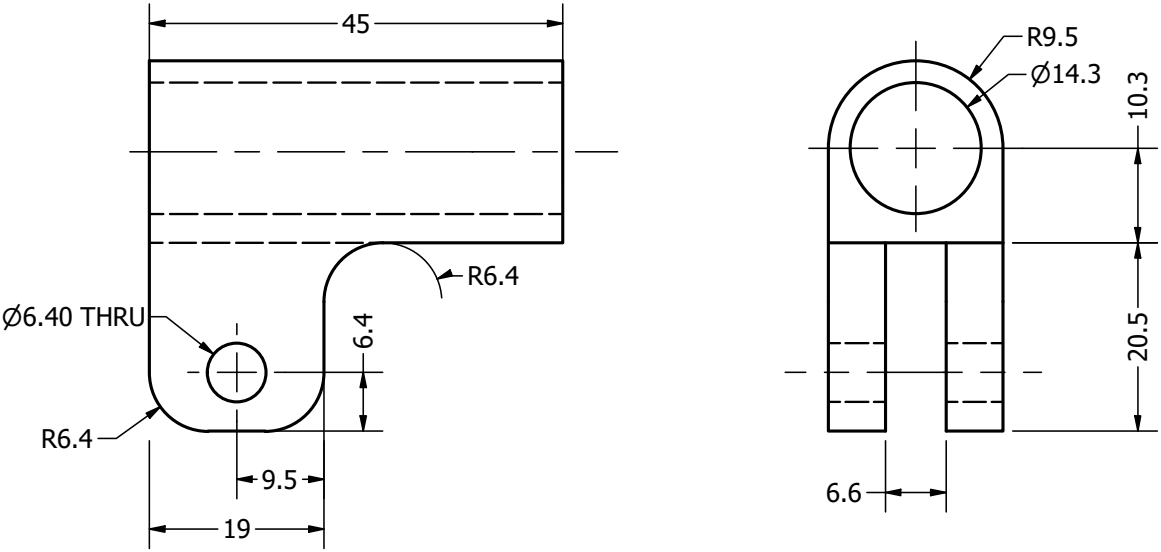


ITEM 3- PEDESTAL HOUSING

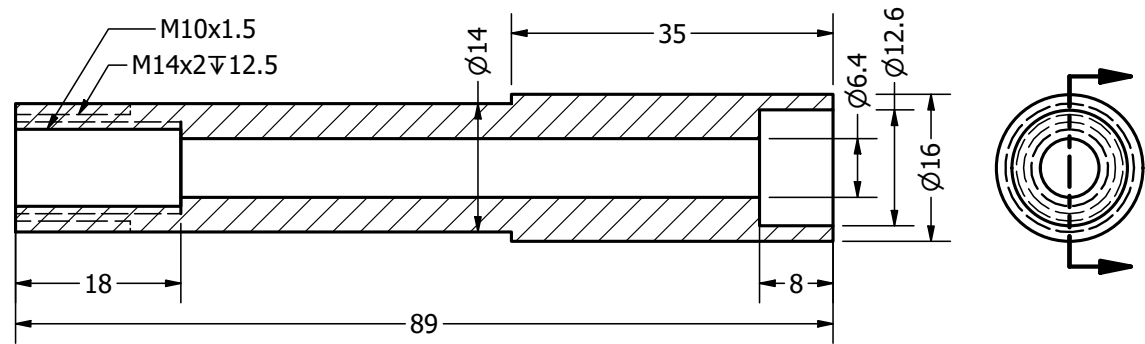


ITEM 2- PEDESTAL

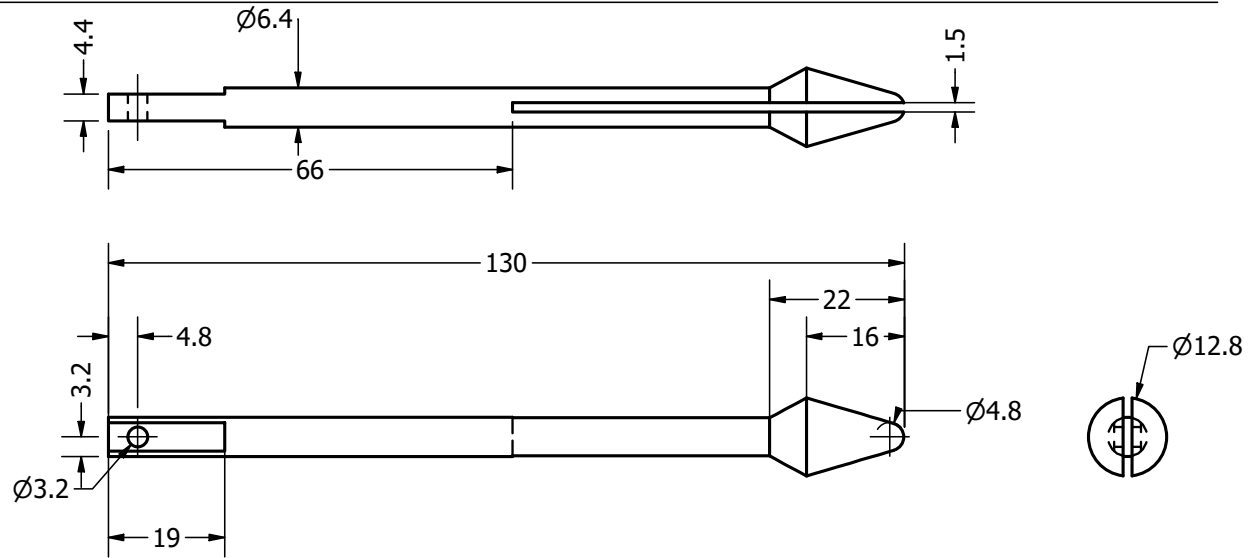
Figure 3: Question 3 geometry definition (fly tying vice).



ITEM 4- MAIN HOUSING



ITEM 5- ROTATING HOUSING



ITEM 6- JAW SHAFT

Figure 4: Question 3 geometry definition (fly tying vice).

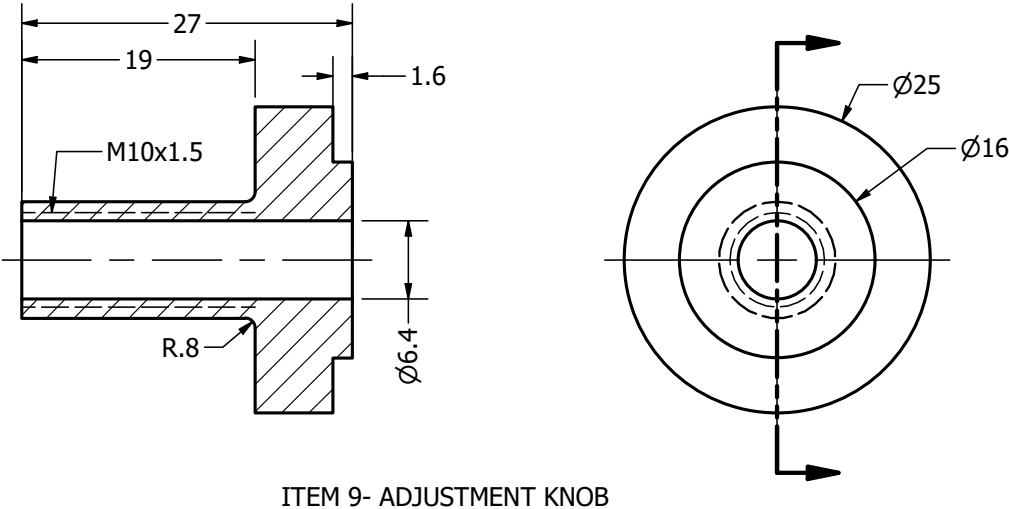
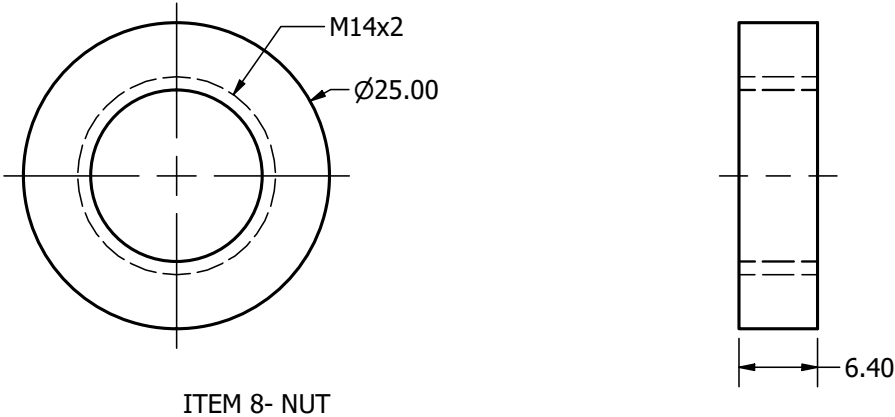
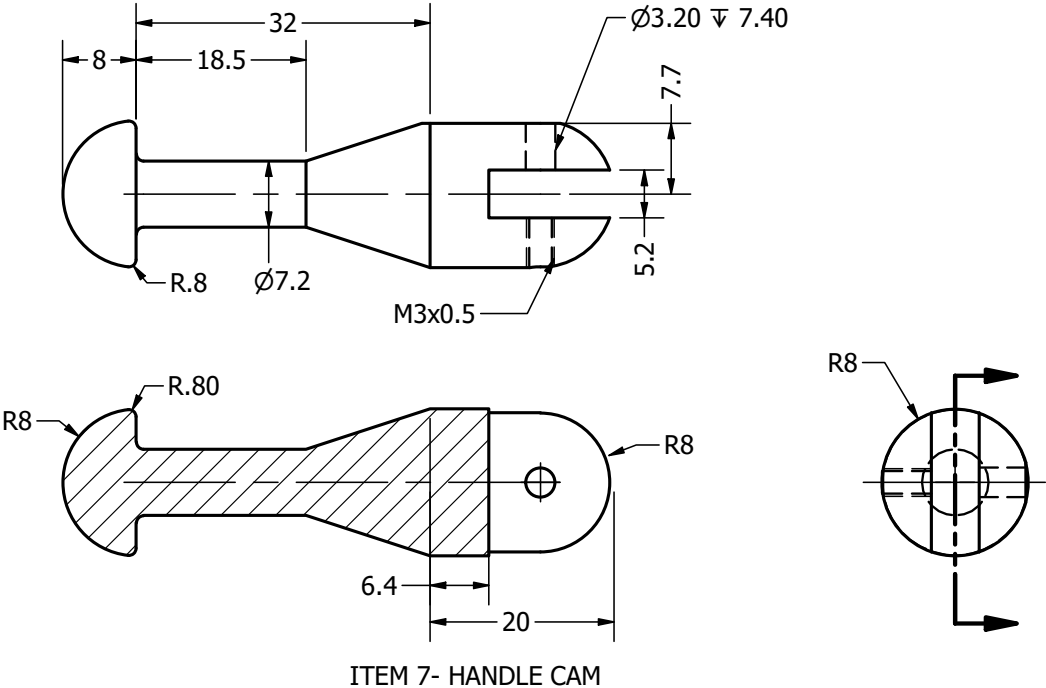


Figure 5: Question 3 geometry definition (fly tying vice).

Question 4 of 4- Drawing Interpretation

[100 marks]

Using the pipework isometric drawing in Figure 6,

- list the number of welds of each type and size required;
- create a list of cut lengths for each pipe (neglect weld size and spacing); and
- determine the mass of each pipe spool. Approximate the mass of reducing fitting as the mass of an equal fitting of the largest branch connection size.

To communicate your working and answer, please submit length and mass information for each spool in a table using the format shown in Table 1.

Table 1: Sample table layout

Description	Length (mm)	Mass (kg)
Spool item A
Spool item B
Spool item C
...
Total	—	Total Mass

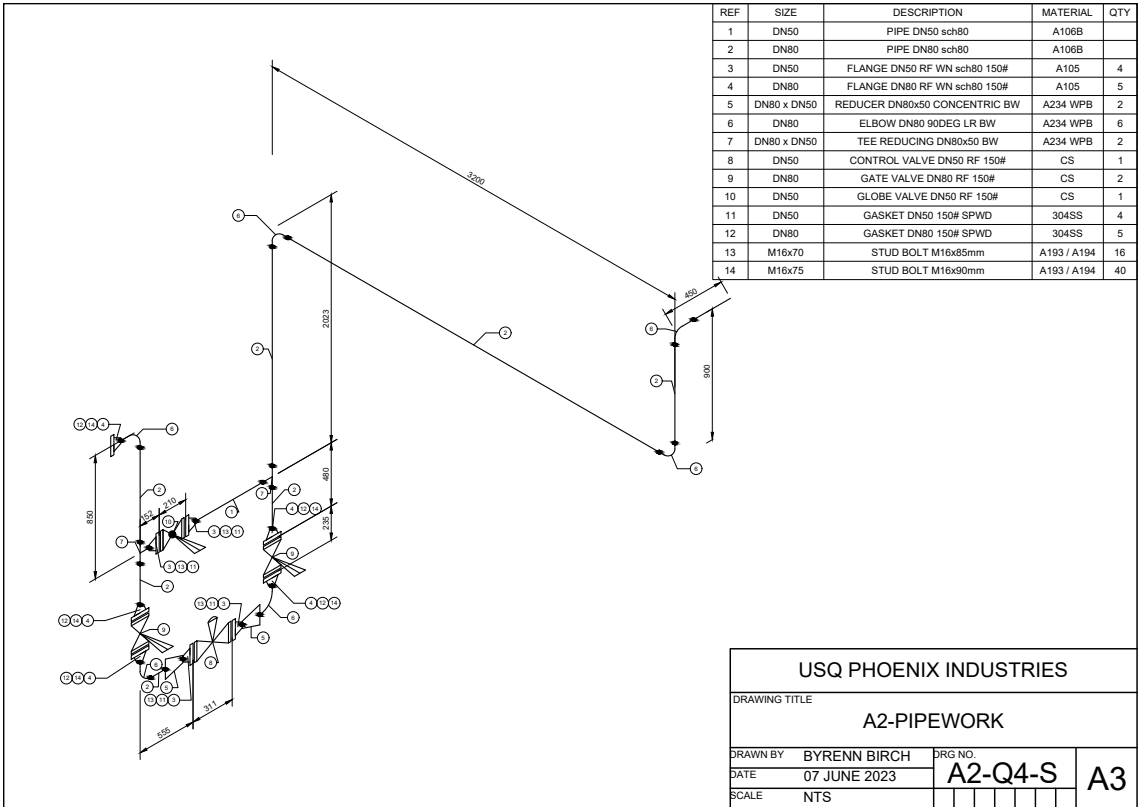


Figure 6: Question 4 geometry definition (Drawing Interpretation).