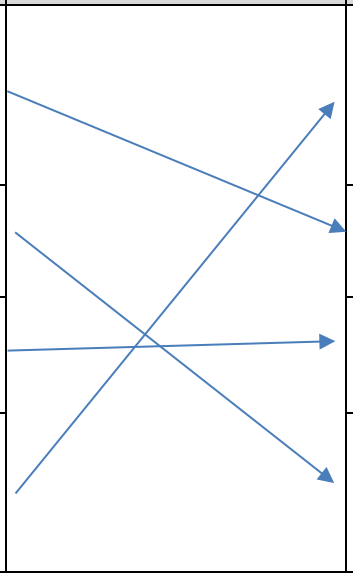
Section 1 Part C – Computer Operations

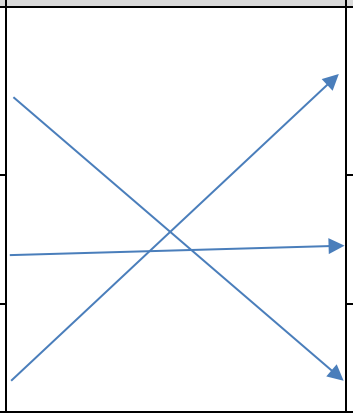
Computing technology and software provides us with many functions and capabilities that are helpful when machining.

1. Match the computing technology or software to its purpose when machining, using an arrowed line.

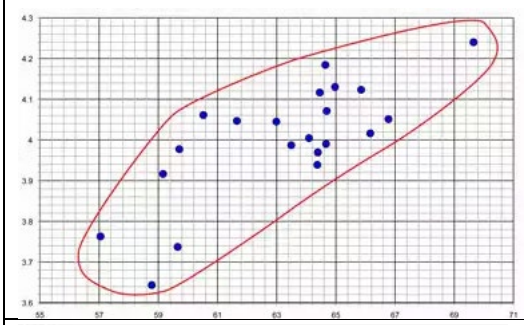
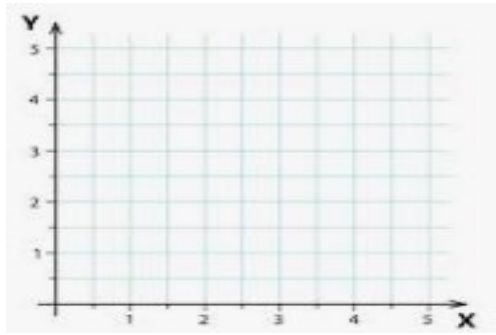
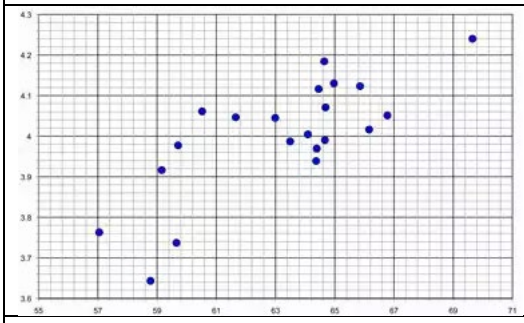
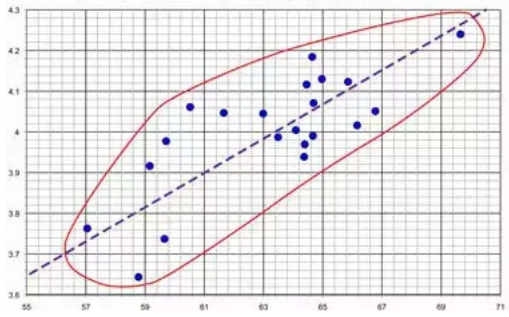
Computing Technology or Software		Machining purpose
Lathe and milling machine digital read out		Controls CNC operated machines, automates machining operations, achieves precision and efficiency, supports complex geometries, optimises cutting strategies, integrates with CAD/CAM systems and enable customisation
Personal computer		Helps guide and position cutting tools to creates more accurate products and increases efficiency by reducing manual measurement
Microsoft Excel		It provides a versatile and powerful platform for data organisation, analysis, calculation, reporting. Can be used to chart data.
CNC computer software		Provides users with a versatile platform for communication, information access and production. Required to use software such as Microsoft Excel.

Computing technology and software provides us with important data outputs that are helpful when machining.

2. Match the data output to its features and purpose when machining, using an arrowed line.

Data output		Feature and machining purpose
Line graphs		Estimates trend identification, correlation assessment, prediction, modelling relationships, data interpretation and visual communication of data patterns
Digital read out (DRO)		In machining it is to enhance precision, accuracy, efficiency and control by reducing manual measurement
Lines of best fit		Is a versatile tool for data visualisation and analysis, providing a clear to understand trends, relationships, changes and patterns in machining data

11. The “Lines of best fit” procedure can be used to estimate the relationship between 2 variables. Match the ‘lines of best fit” picture to its procedure order number and description, using an arrowed line.

Picture		Procedure number and description
		2. Mark out a set of points on the chart that reflect your data
		4. Draw a line through the shape you have drawn, that divides it evenly
		1. Develop a blank chart with x and y axis
		3. Draw a shape (usually an oval) that encloses all of the data points

Section 2 Part A – Drill speed graph

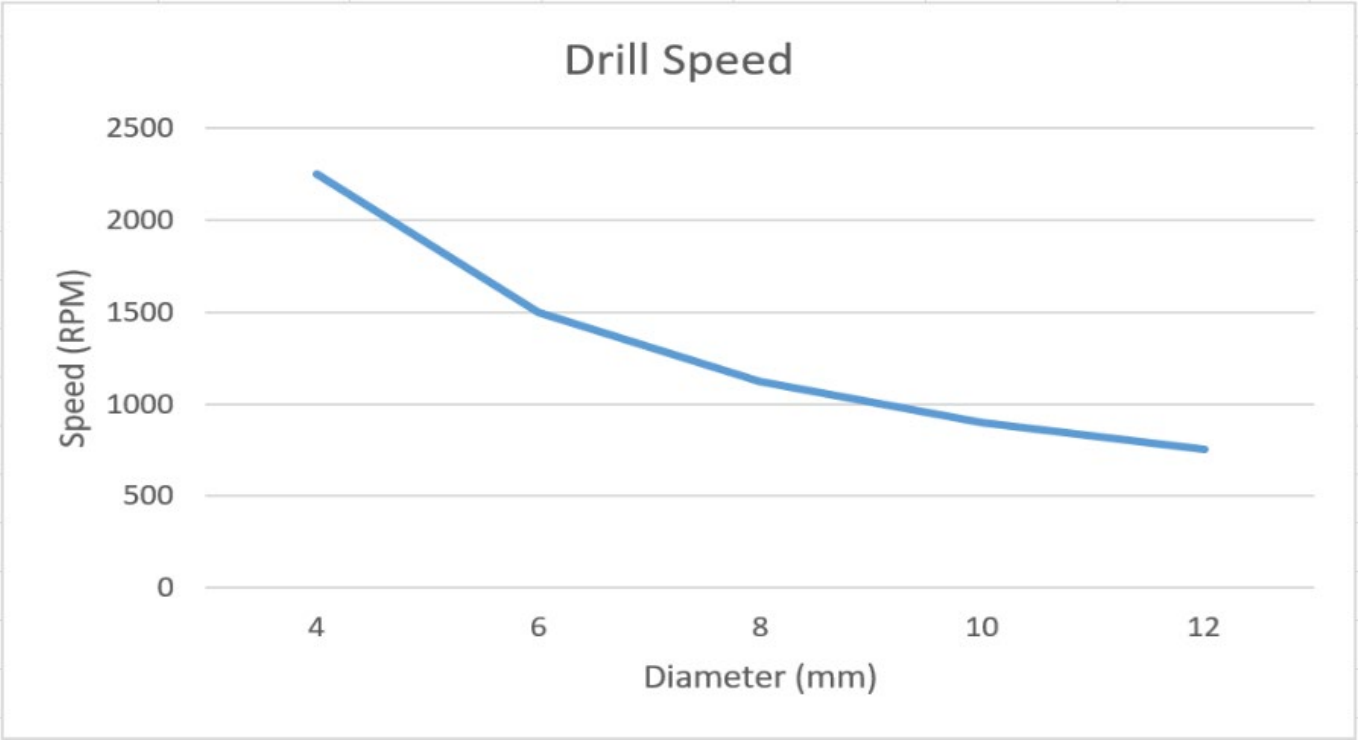
Student Instructions:

1. Enter the drill speed data into a spread-sheeting program such as Microsoft Excel
2. Generate a line graph showing Drill Diameter vs Speed
3. Take a screenshot of the graph
4. Paste your completed work below where indicated
5. Answer associated questions

Drill Speed Data

Drill Diameter (mm)	Speed (RPM)
4	2250
6	1500
8	1125
10	900
12	750

Paste your line graph HERE



1. What do you notice about the speed as the diameter increases?

The speed must decrease

2. Estimate the speed used for a 20mm drill bit

Answers will differ but should be around 450

3. Calculate the Drill Speed RPM used for a 20mm drill bit using the following formula where: x = drill bit size and y = Drill Speed RPM
   - $x = \frac{9000}{y}$
   - $20 = \frac{9000}{y}$
   - $20y = 9000$
   - $y = \frac{9000}{20}$
   - $y = 450$
   - Drill Speed RPM for a 20mm Drill Bit = 450

4. What was the difference between the estimate and actual speed (if there is any)?

Answers will differ

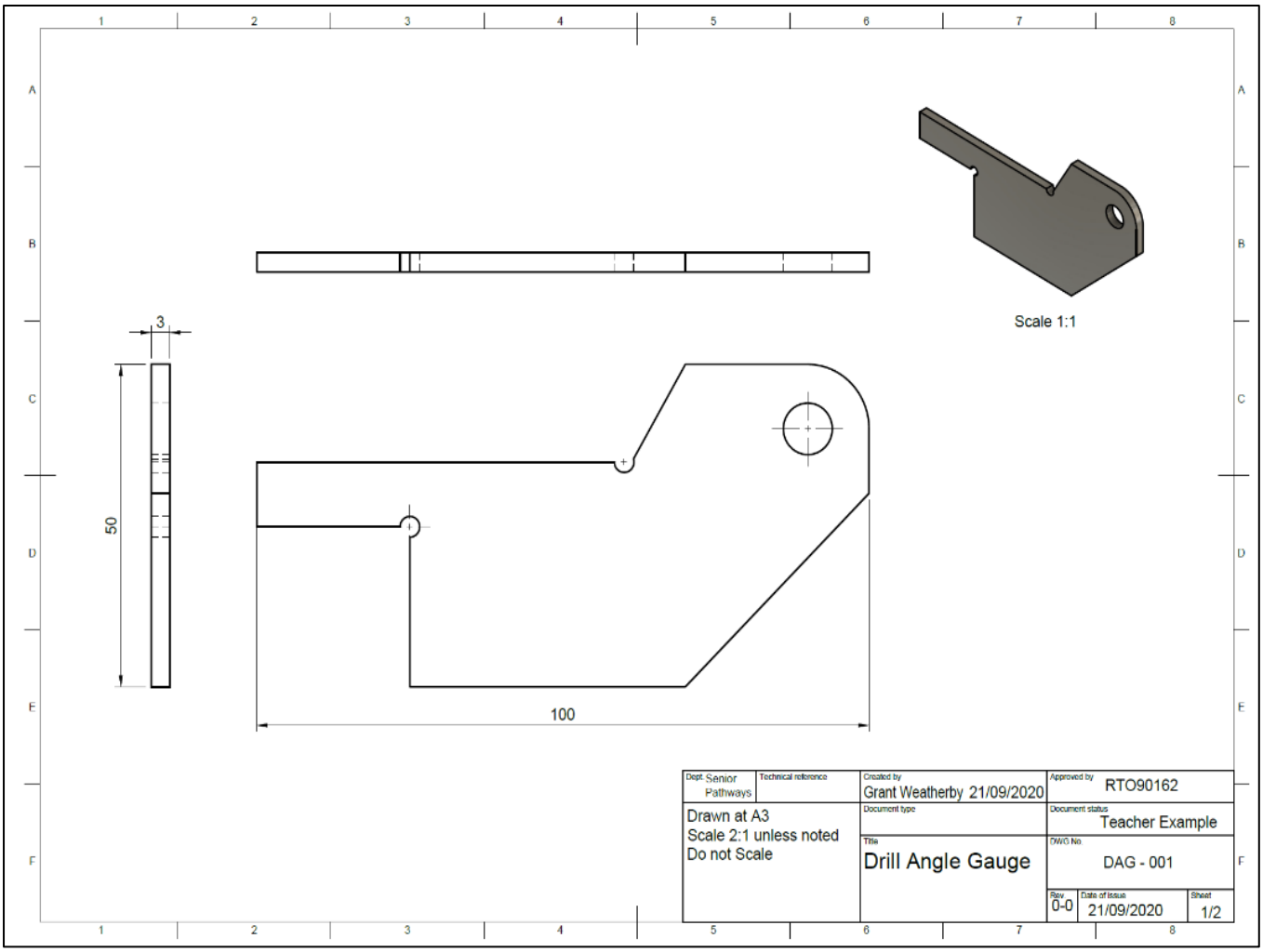
Section 2 Part B – Computer Aided Drawing (CAD)

Student Instructions:

- Your teacher will provide you with a set of project plans
- Develop a 3D model of ONE project (identified by your trainer) using an appropriate CAD program such as Fusion, Autodesk Inventor or Google Sketchup.
- Produce a pictorial view of the project and 3 orthographic views showing overall dimensions of the project and laid out according to AS1100 standards. The pictorial view may be rendered by the software. Ensure your title block is completed.
  1. Identify/locate the help menu or CAD program tutorial and follow as required
  2. Ensure the item is drawn using the appropriate dimensions and units
  3. Save the file and capture a screen shot of the 3D model
  4. Submit to your assessor via email
  5. Paste your completed work below where indicated
  6. Log off and shut down the computer

Note: Consult with your teacher and/or use information sources for assistance when required

Paste your CAD HERE



Section 2 Part C – Material List

Student Instructions: Develop a computer-generated material list using a spread-sheeting program such as Microsoft Excel for ONE project (identified by your trainer).

The material list must include the following and look like the example below.

- Each part of the project listed and the dimensions of the material used
- A formula to calculate the total length of material for each part (Length x Quantity)
- Include a pie or column graph showing the total cost of producing each item.
- Paste into the blank page below

Project material list example for Soft Face Hammer (other project may be used)

Item #	Component Description	Stock Material	Size	Length (mm)	Quantity	Total (mm)	Cost/m $	Total Cost $
1	Fixed Jaw	Mild Steel	50x12	80	1		80	4.20
2								
3								
4								
5								
6								
7								
8								
9								