National 4/5
Graphic Communication
Theory

TOPIC 2: 2D Computer Aided Design (CAD) 3D Computer Modelling Commands, Techniques and Practices.

2D Computer Aided Design (CAD) Commands, Techniques and Practices.

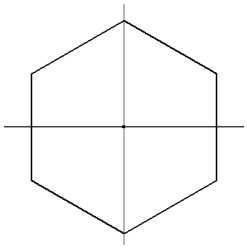
Drafting Commands:

Line

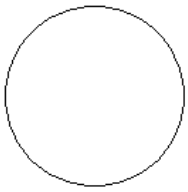
Arc

Rectangle

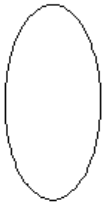
Polygon (used shapes with different numbers of sides



Circle



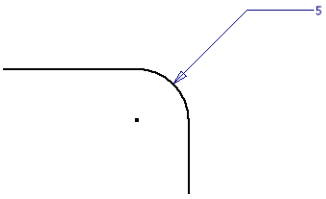
Ellipse



Text

drawing

Fillet

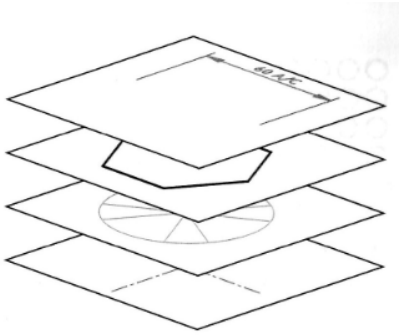


Layout commands:

Layers:

Layers

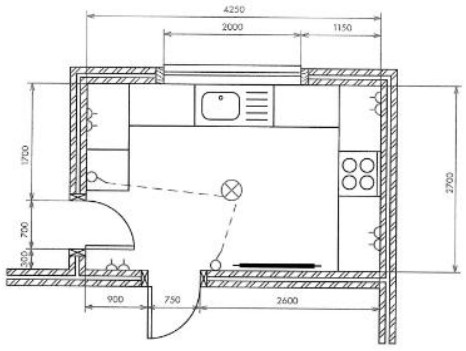
CAD software enables drawings to be built up in a series of layers. Different drawing features are allocated to separate layers e.g. dimensions, construction lines, text and outlines. Layers are like clear film overlays that can be switched on or off to control the parts of a drawing to be viewed.



Layers provide several benefits:

- Drawings can be built up in stages and are easier to manage.
- Several versions can be printed, each with different layers visible.
- Printing selected layers makes the drawing easier to understand.
- Careful selection of layers allows printed information appropriate to the user, giving architects and engineers greater control over what tradespeople and clients will see.

The floor plan below shows a drawing for a new kitchen extension. All the layers are visible and consequently the floor plan is cluttered and difficult to understand.



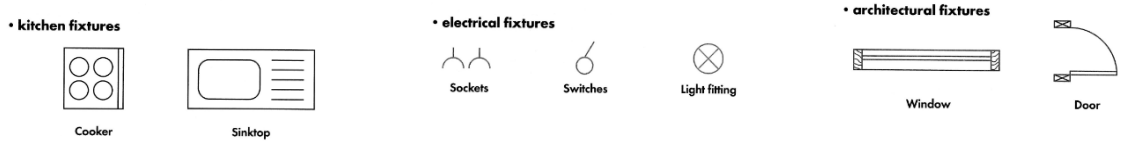
kitchen extension

CAD Library:

CAD library

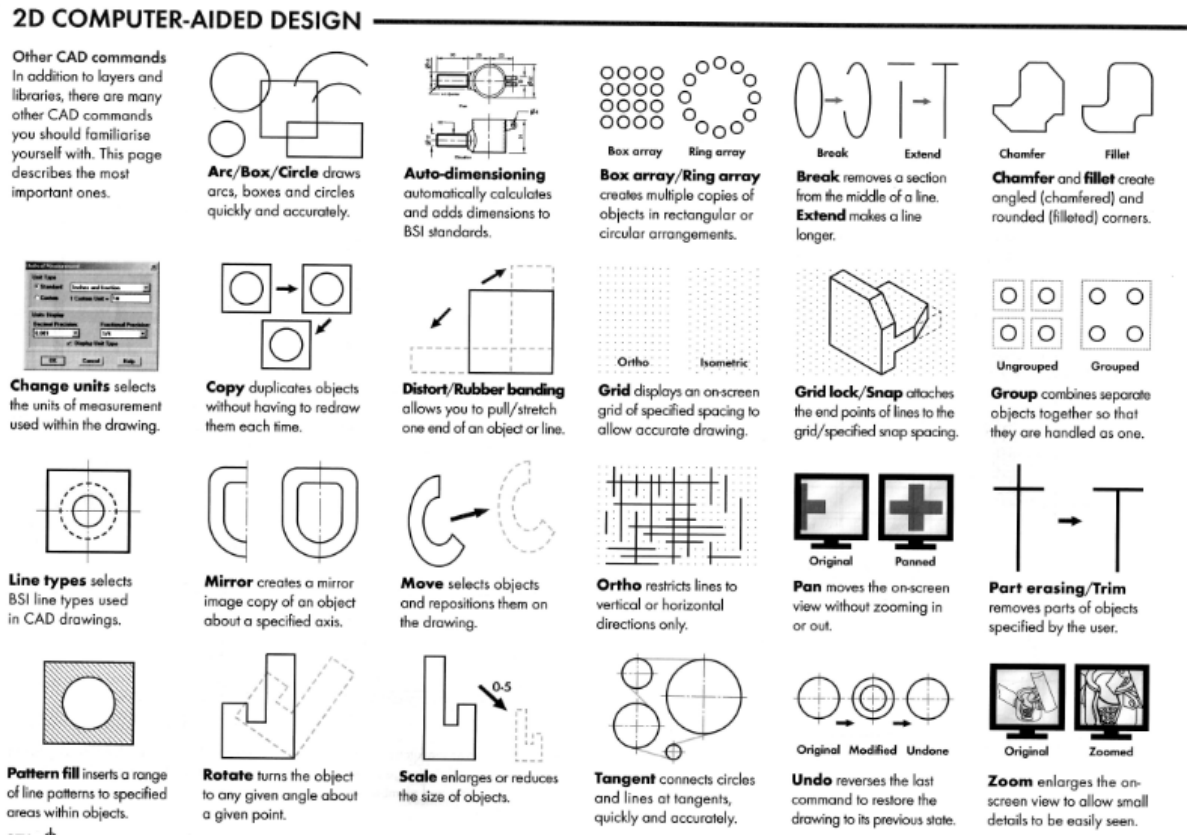
A CAD library of standard parts or components enables the user to store pre-drawn icons for use on any number of drawings. These icons are often pre-installed as part of the CAD application but can be drawn in-house and updated as designs change. The CAD library saves time and effort by enabling the architect or engineer to select icons from a palette or menu and drop them into composite drawings.

For example, the kitchen extension design shown here makes use of several standard library components:



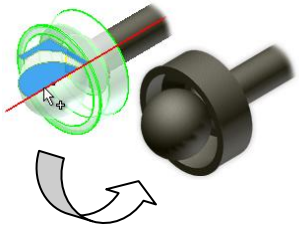
Examples of items that might be stored in this CAD library

Editing Commands

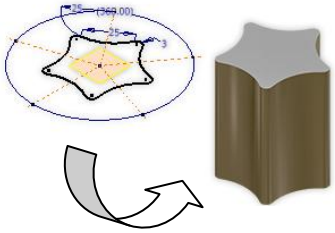


3D Computer Modelling Commands, Techniques and Practices.

Modelling Techniques

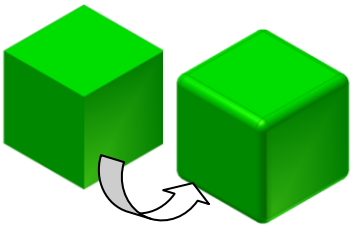


Revolution

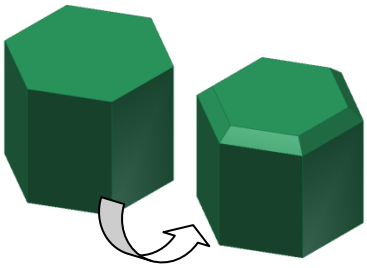


Extrusion

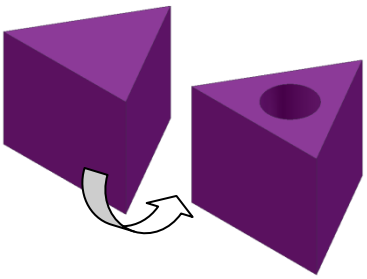
Modelling Edits, shell, subtraction, union, fillet, chamfer



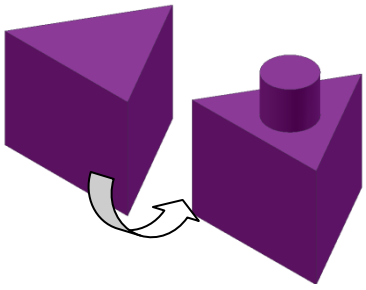
Fillet



Chamfer

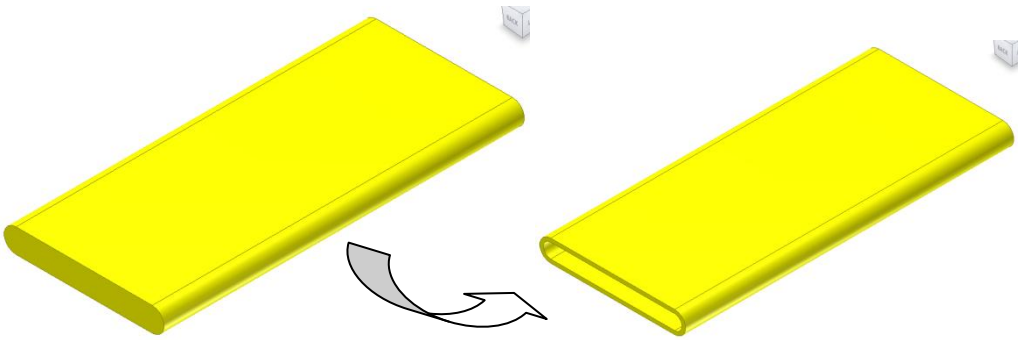


Subtraction



Addition

Use the **Union** command to ensure that both parts of the solid are one object



Shell

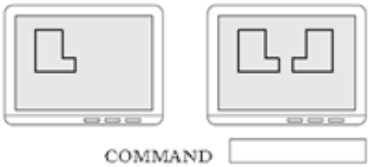
Homework 2 Questions

Question 1

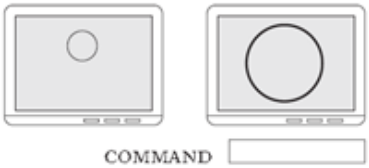
The following drawings are the result of applying 5 2D CAD commands

State the name of the command used in each case

1.

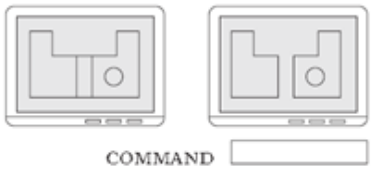


2.

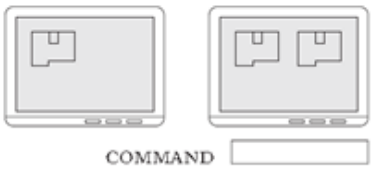


3.

4.



5.



Question 2

Drawings of a van are shown opposite. State the single CAD command that would be used to create the following details.

a) The straight edge shown at A _____

b) The rounded corner shown at B _____

c) The curved surface shown at C _____

d) The angled corner shown at D _____

e) The circumference of the circle shown at D _____

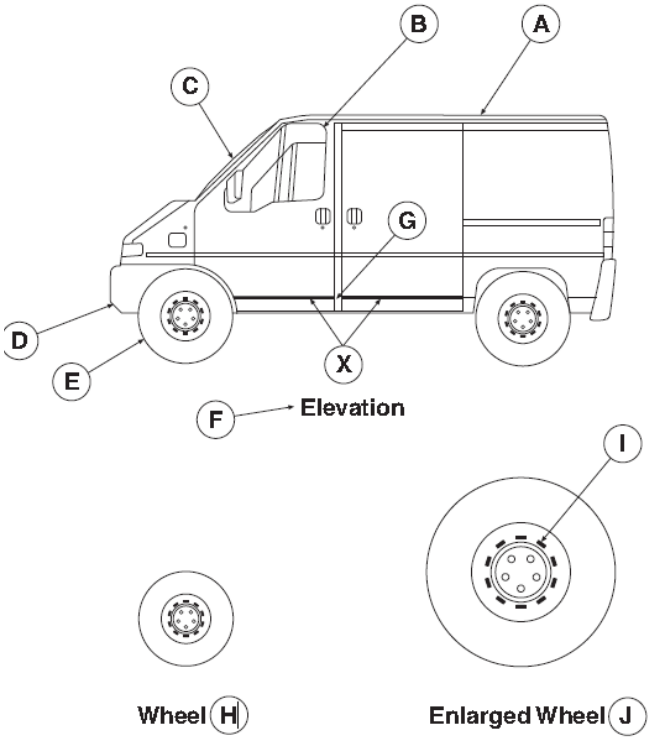
f) The writing shown at _____

g) The gap in the line X shown at G _____

h) The Identical wheel shown at H _____

i) The identical features shown around the wheel shown at J _____

j) The enlarged wheel shown at J _____



An exploded isometric view of the trophy, you have modelled is shown below. Name the 3D modelling or editing command that produced the different features

a) The square base at **A** before the hole and sloping edges were added

_____

b) The slot in the medal shown at **B**.

_____

c) The rounded corner shown at **C**

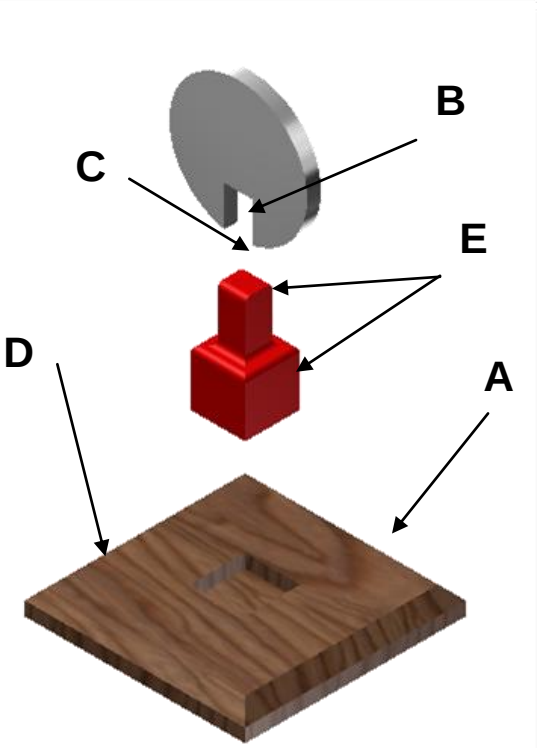
_____

d) The angle corner shown at **D**

_____

e) The command used to ensure that both the red cuboids are one part, shown at **E**.

_____

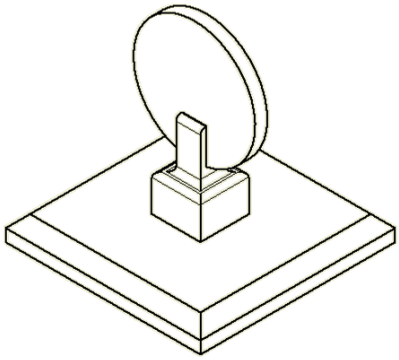


Question 4

What **2** changes would need to made to change **view 1** into **view 2**

Change 1_____ Change 2 _____

View 1



View 2