

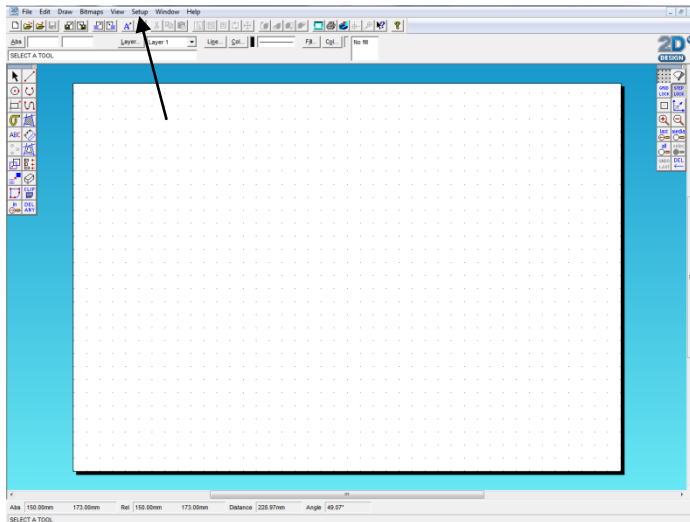


Working With 2D Design

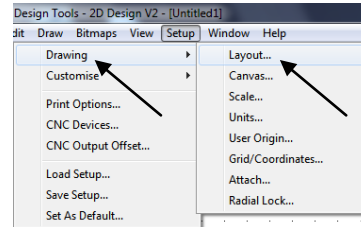
Produce by: **A Moore**
Technology Technician



SETTING MATERIAL SIZE



Select Setup

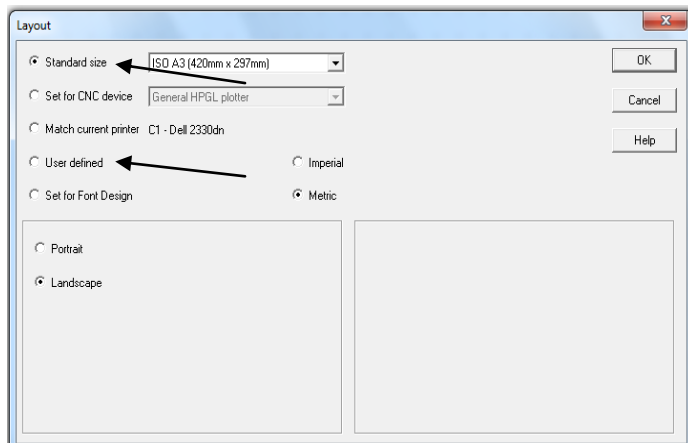


Drawing

then

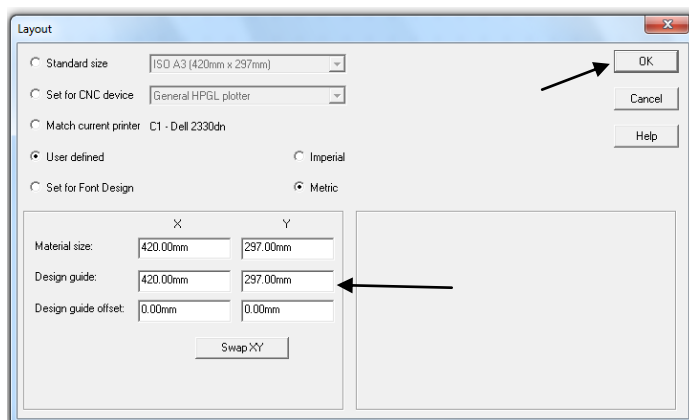
Layout

Select Standard Size if you require A4 or A3 etc.



Portrait or Landscape as required

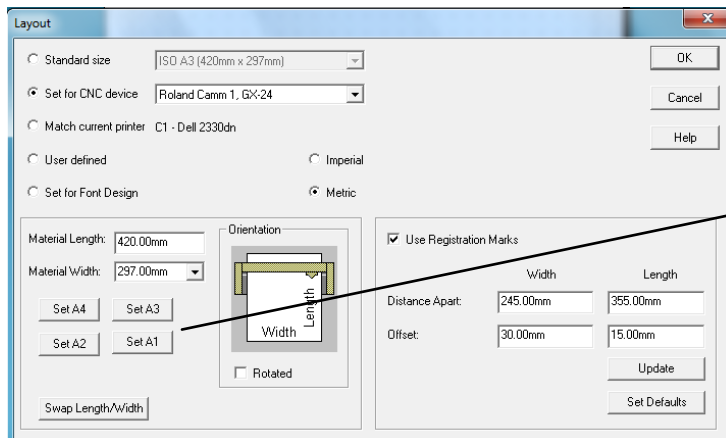
If you require a specific size select User defined.



In Material Size enter the dimensions you require X = horizontal dimension, Y= vertical dimension

Click OK

Setting material size for cutting a specific area



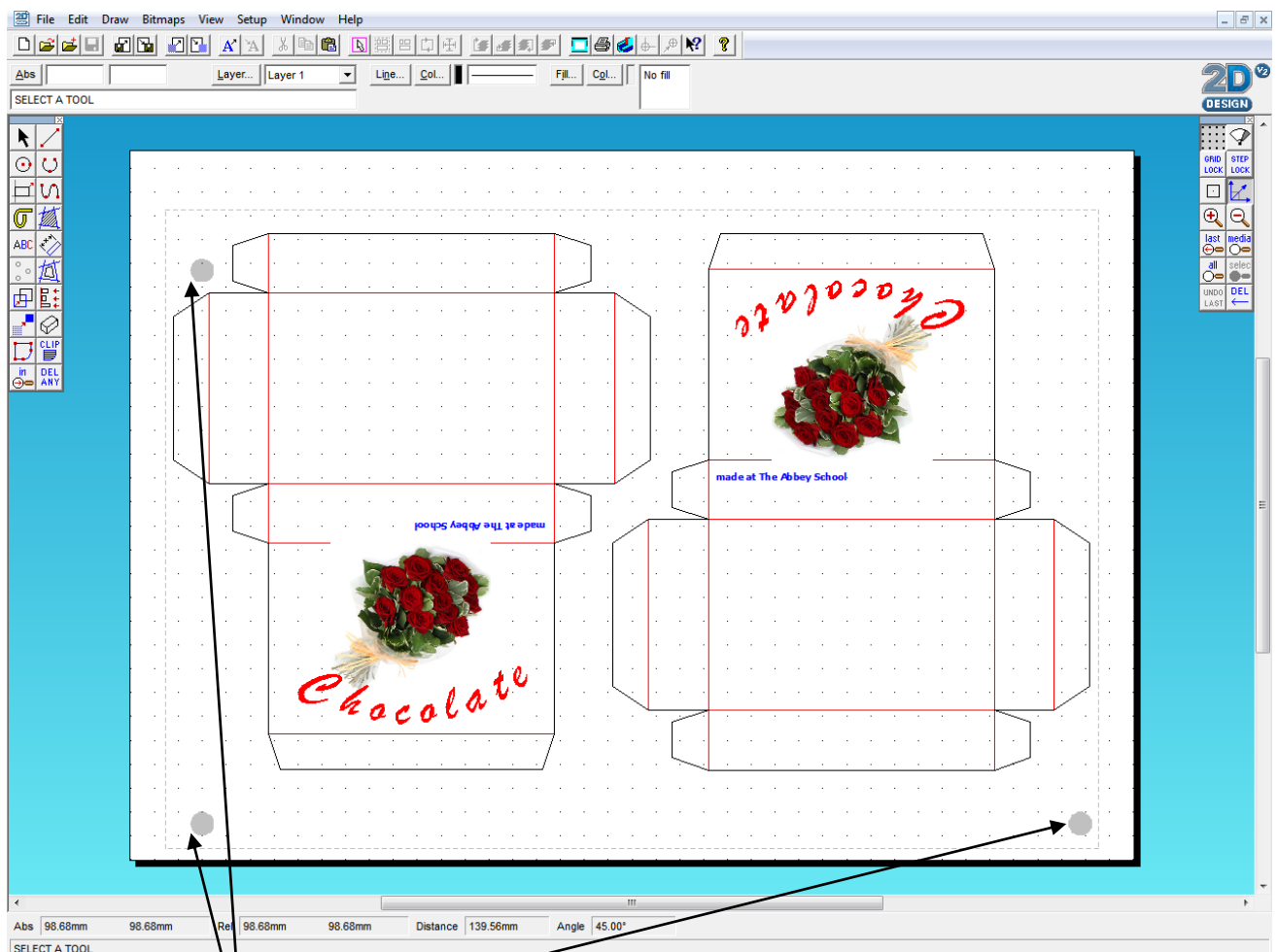
Select Set for CNC device.

Select Roland Camm 1, GX-24



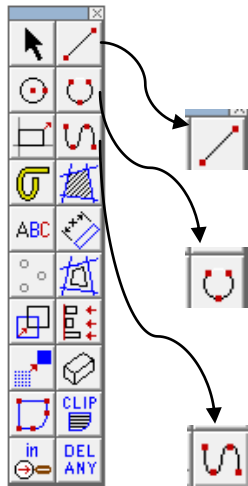
Select page size

Select Use Registration Marks.



FREEHAND DRAWING

Freehand drawings in 2D Design can be created using 3 main tools.

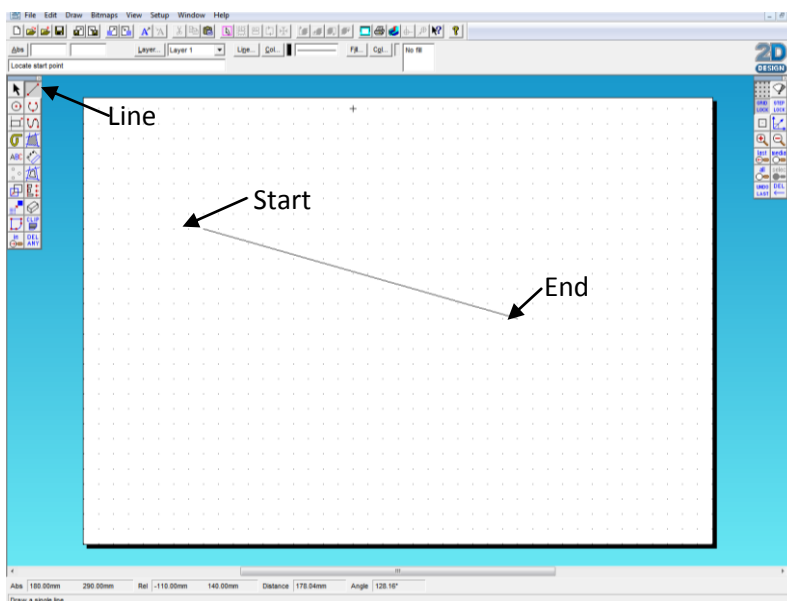


Lines this will draw a straight line selecting the start and end points.

Arcs this will draw a curved line selecting the start, centre of the arc and end points.

Path this will draw a continuous curved line that can change direction with each mouse click until you click the right mouse button.

Lines

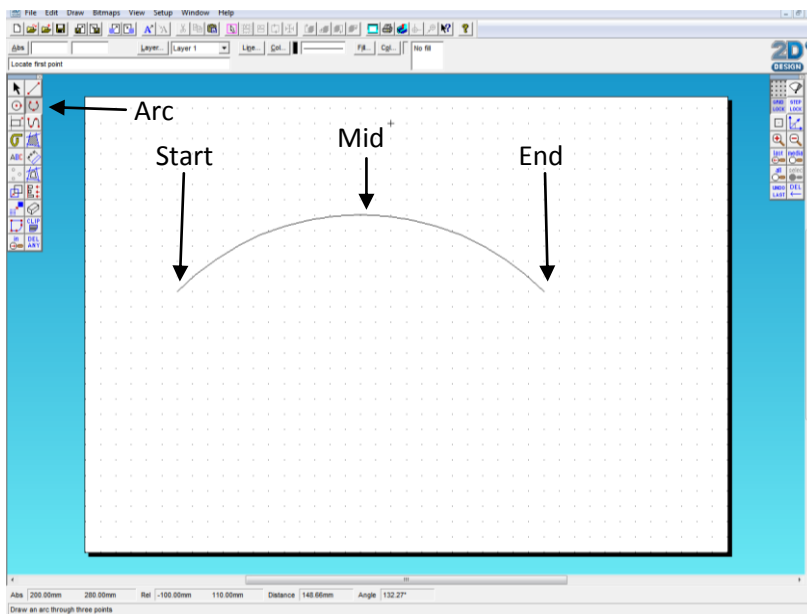


Select Line

Select Start Point

Select End Point

Arc



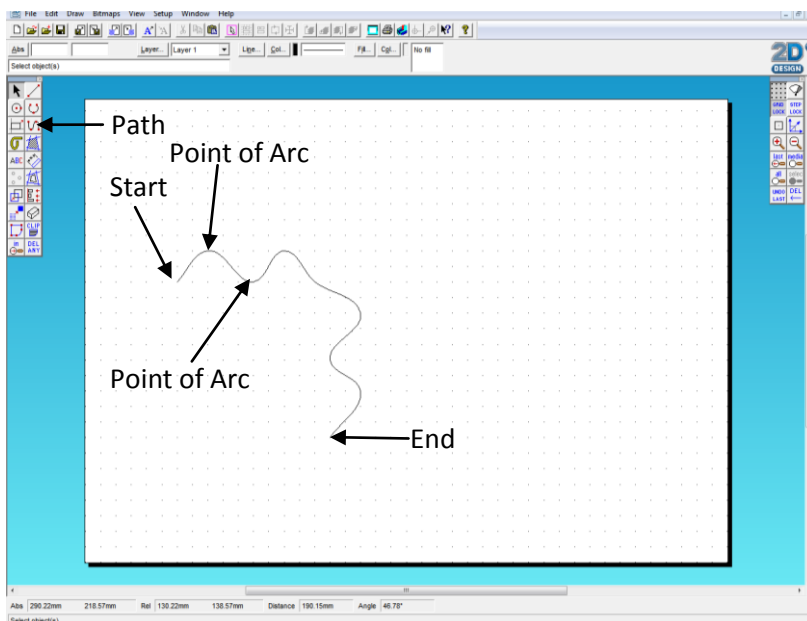
Select Arc

Select Start Point

Select Mid Point

Select End Point

Path



Select Path

Select Start Point

Select point of arc

Select next point of arc

And so on until you have reached the point you wish to end.

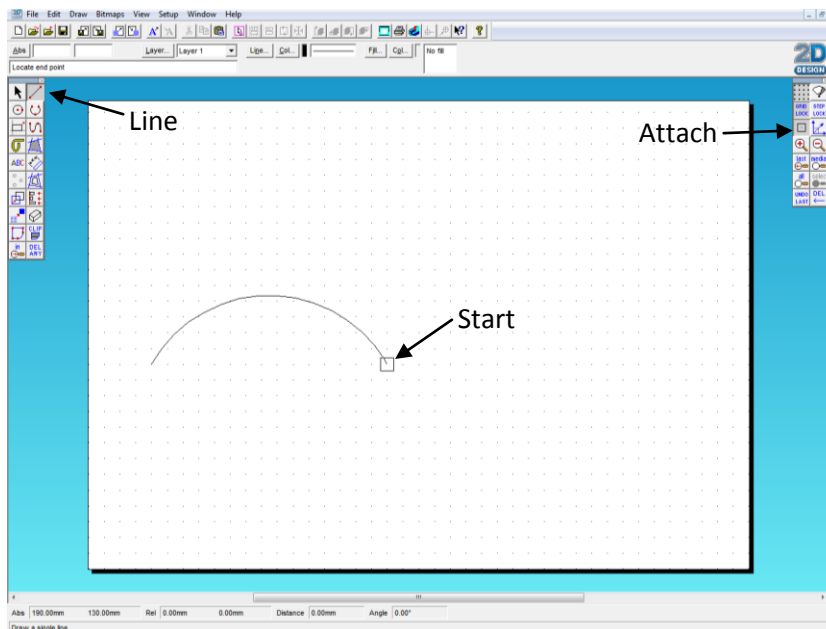
(Note; the closer the points of the arc the tighter the curve)

Use the Right Mouse Button to Finish.

Attach Lines



To continue a line from the end point of the previous line use Attach

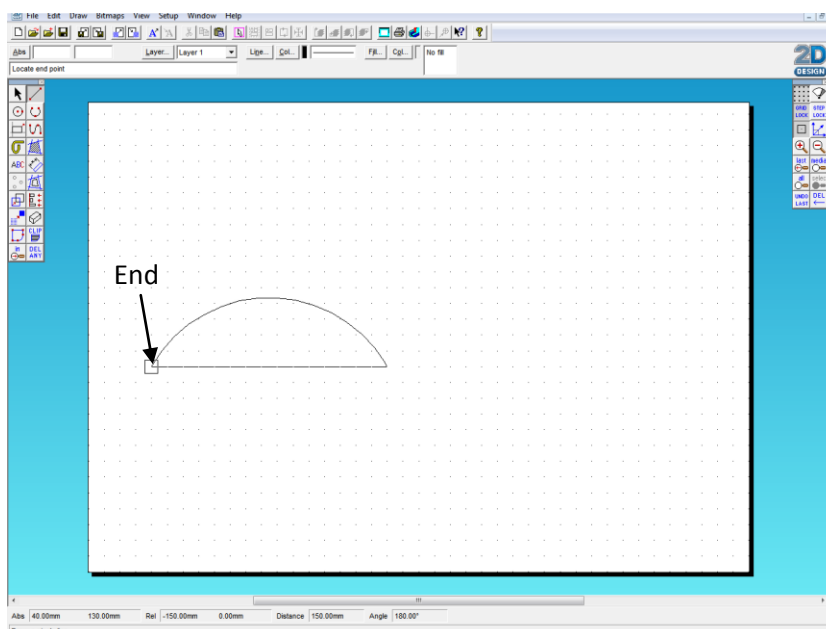


Draw an Arc

Select Attach

Select Line

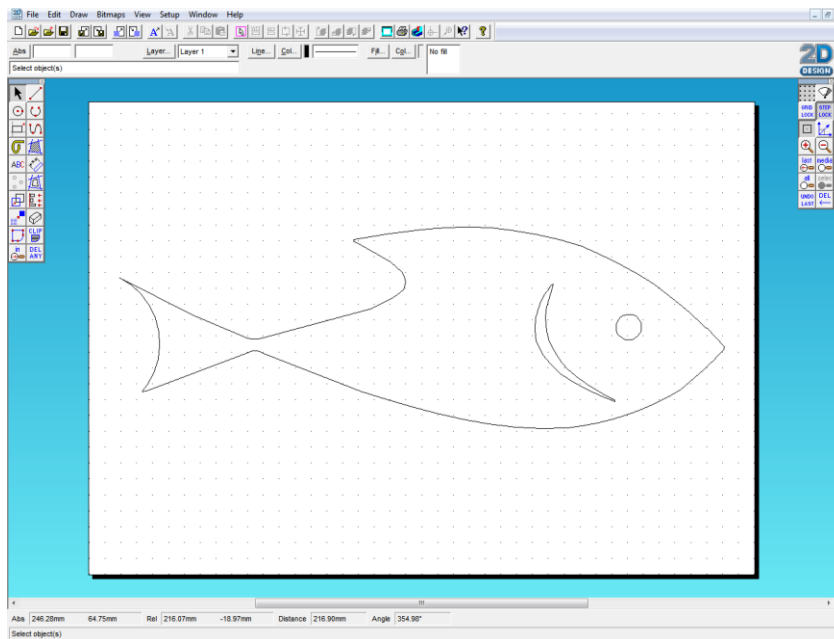
Position the square over the end of the line you are going to attach the next line to, click the left mouse button.



Position the square over the end of the second line, click the left mouse button.

If you only want to attach one end of a line just select Attach again to turn it off

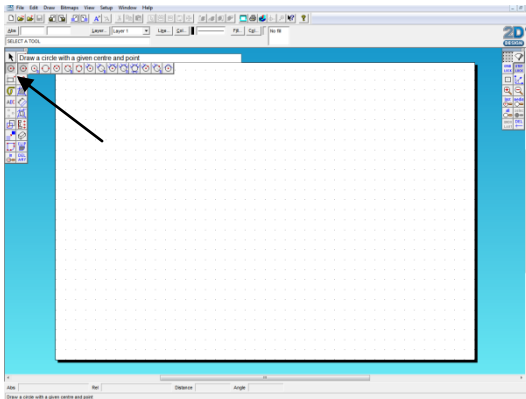
Exercises



Draw this fish using Line, Arc and the Path tools.

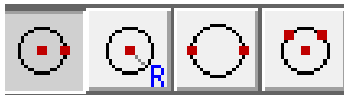
Ensure that all lines are joined by using the Attach tool.

DRAWING CIRCLES

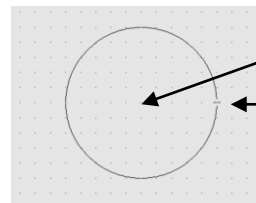


Click and hold on the circle tool bar.

Select the best way to create the circle for your drawing.



Draw a Circle with a given centre and point

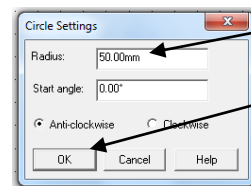


Select Centre

Select outer point

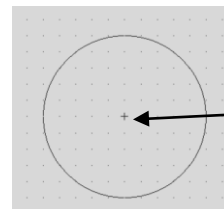


Draw a Circle with a given Centre and Radius



Enter Radius of circle

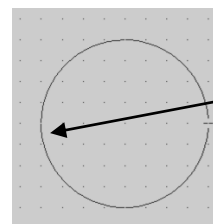
Click OK



Click to place the centre
of the circle



Draw a Circle locating diametrically opposite points.

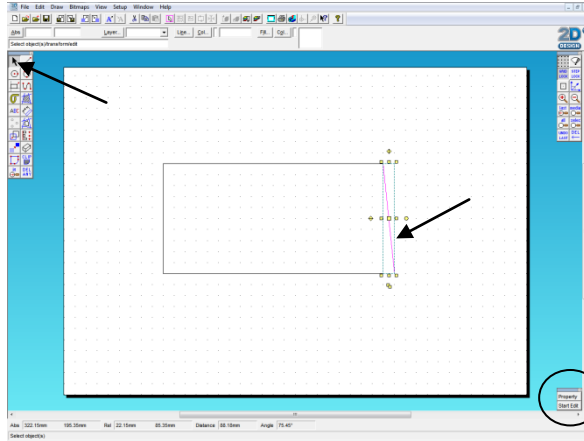


Select first point

Select second point

EDITING LINES

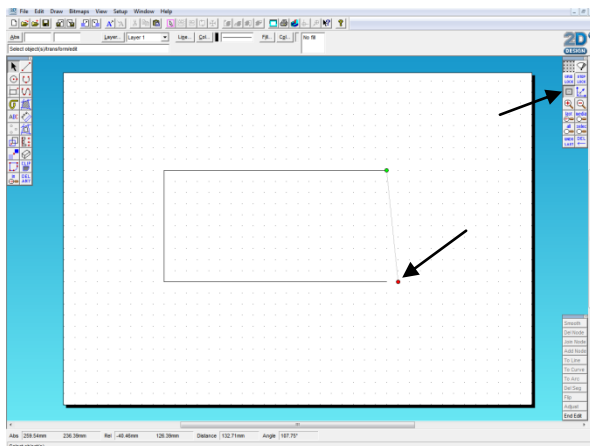
Connecting lines



Click Select

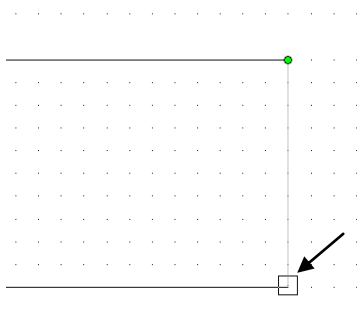
Select line to edit

Click Start Edit



Select Attach

Click on either the Red or Green dot. (This will depend on the end of the line to be attached.)

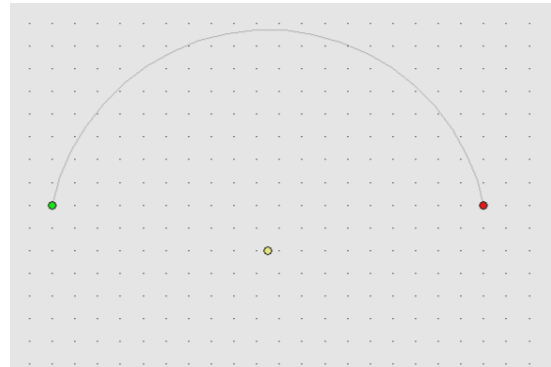
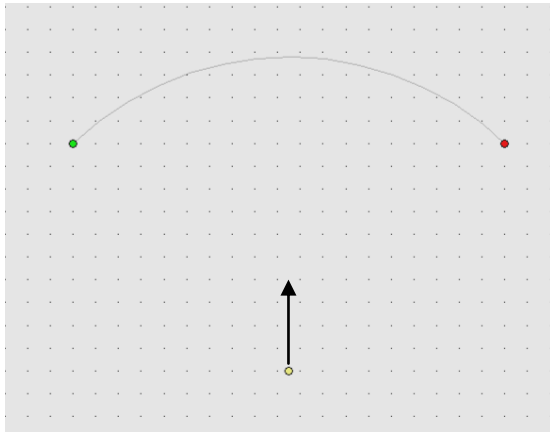


Move the square over the end of the line to attach to and click.

Click End Edit

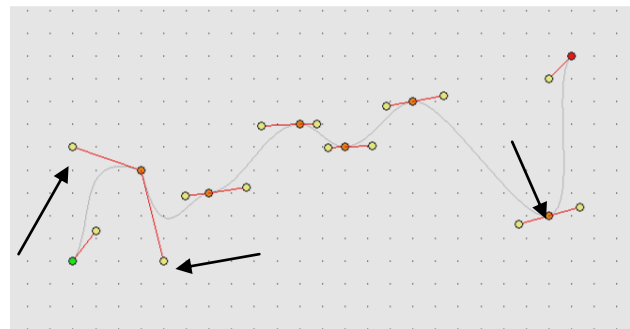
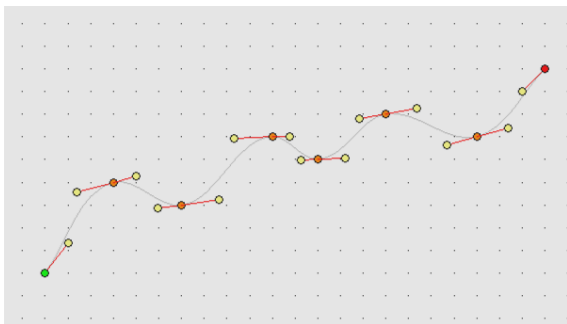
Editing a Curved Line

By moving the yellow dot you can change the curvature of the line.



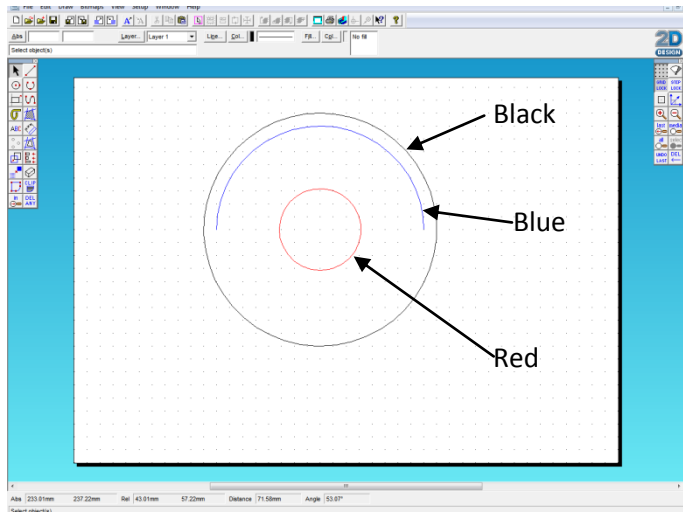
By moving the Orange dot you can change the position of part of the line.

By moving the yellow dot you can change the curvature of the line.



PREPARING DRAWINGS FOR CUTTING AND/OR ENGRAVING

To ensure the machine knows which line to cut and which to engrave, you must identify the lines with colours.



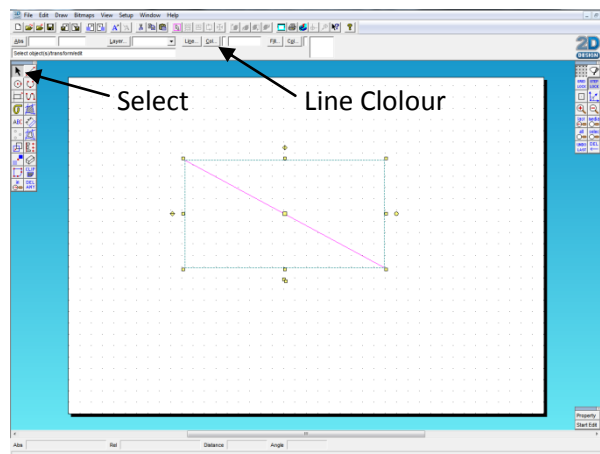
Black Line to cut

Blue Line to engrave a single line

Red Line to engrave an enclosed area.

(Enclose area's must have the end of the line joined with no gaps)

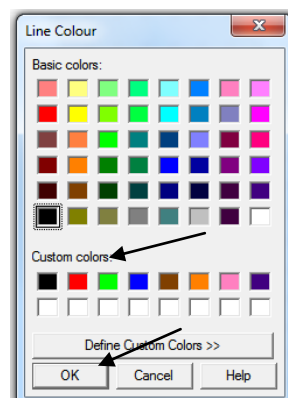
Change a line colour



Click Select

Select Line

Click on Col next to Line



Select colour

Black, Red or Blue

(Only select colour from Custom Colors:)

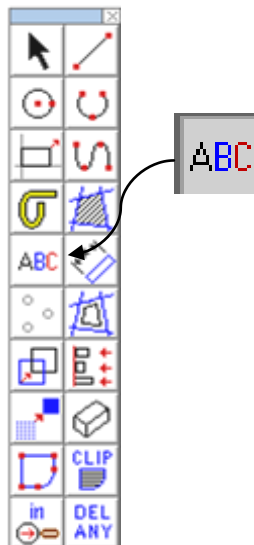
Click OK

Exercise

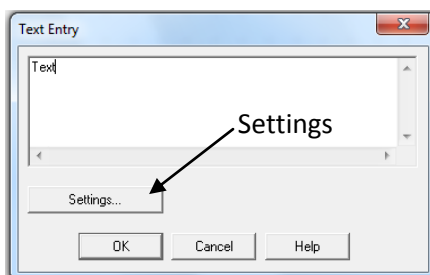
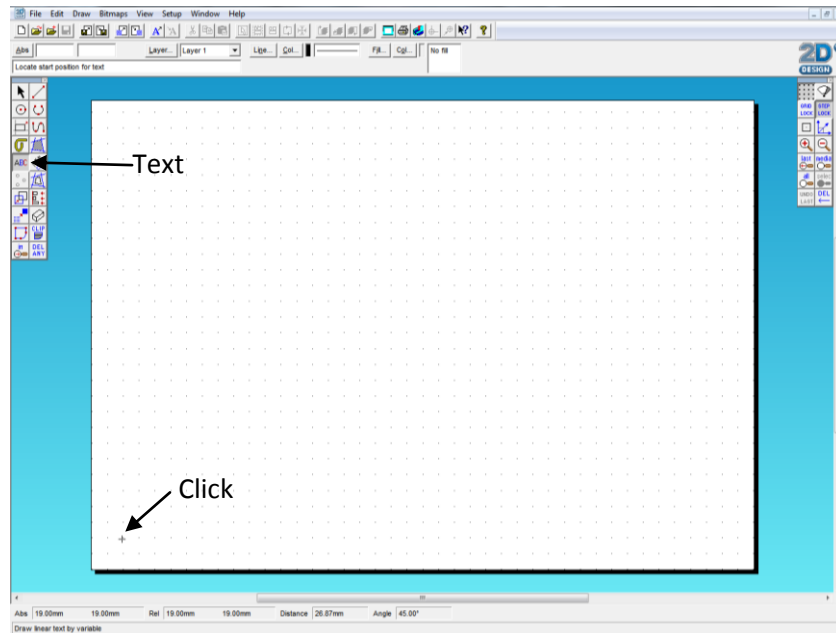


Look at this image and identify the lines that should be Black, the lines that should be Blue and the lines that should be Red.

TEXT



Select Text then left mouse click the bottom left of the drawing area.



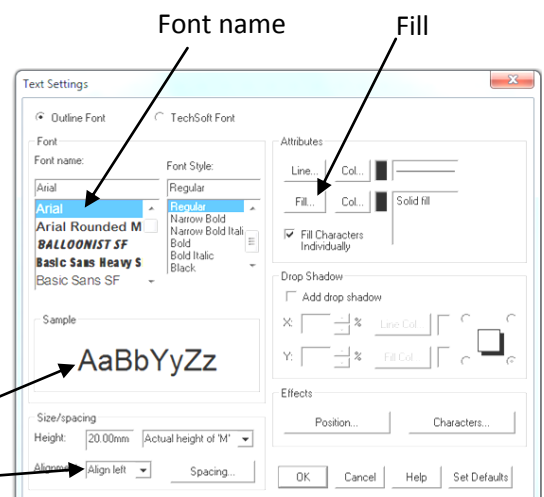
Type in your text

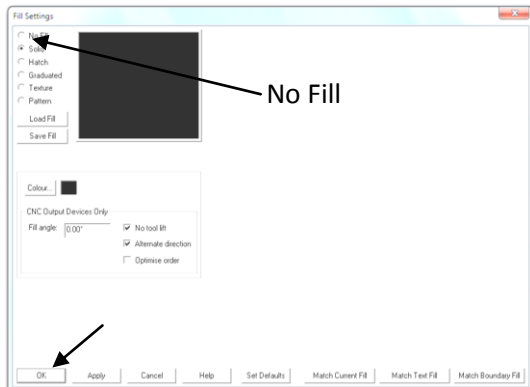
Select Settings

Click Font name in the scroll box, use the arrow keys on the keyboard to move down the names, until you find the font you wish to use.

(You can see what the font looks like in the Sample box)
If you have more than one line of text you can select Alignment, then Centred.

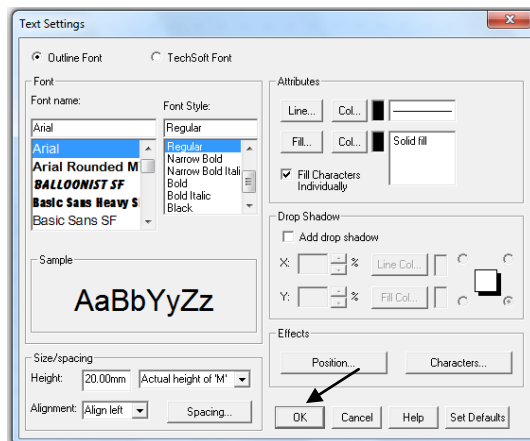
Select Fill



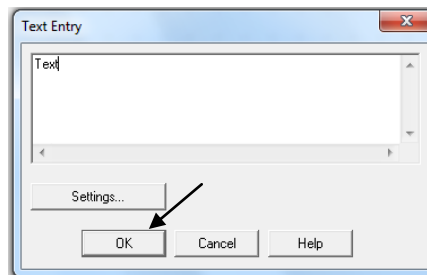


Select No Fill

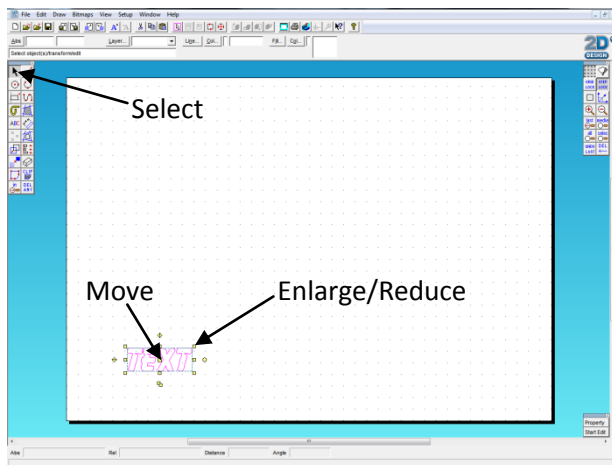
Select OK



Select OK



Select OK



Click Select

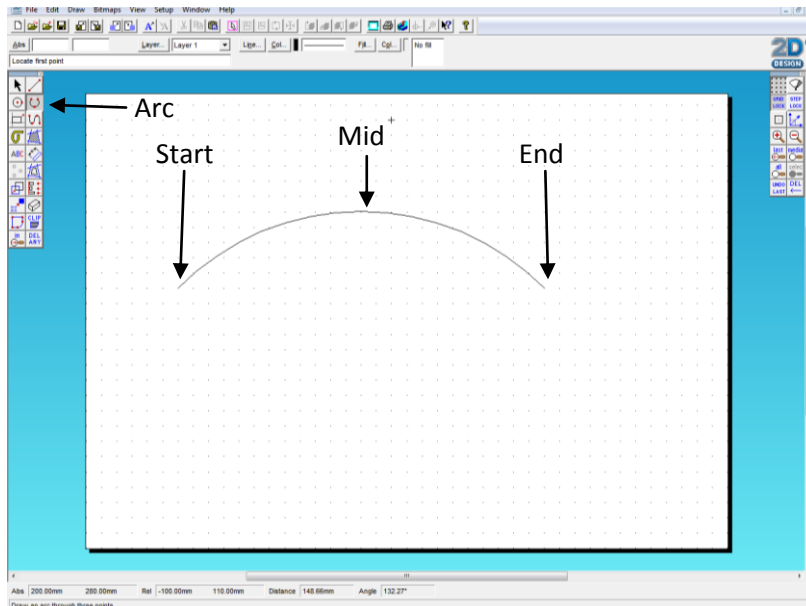
Select Centre Yellow Square to move text.

Select Corner Yellow Square to make text bigger or smaller.

(If you hold down the Shift on the keyboard when selecting the corner square you can maintain the aspect ratio of the text)

Creating Text on a Curve

Draw an Arc



Select Arc

Select Start Point

Select Mid Point

Select End Point



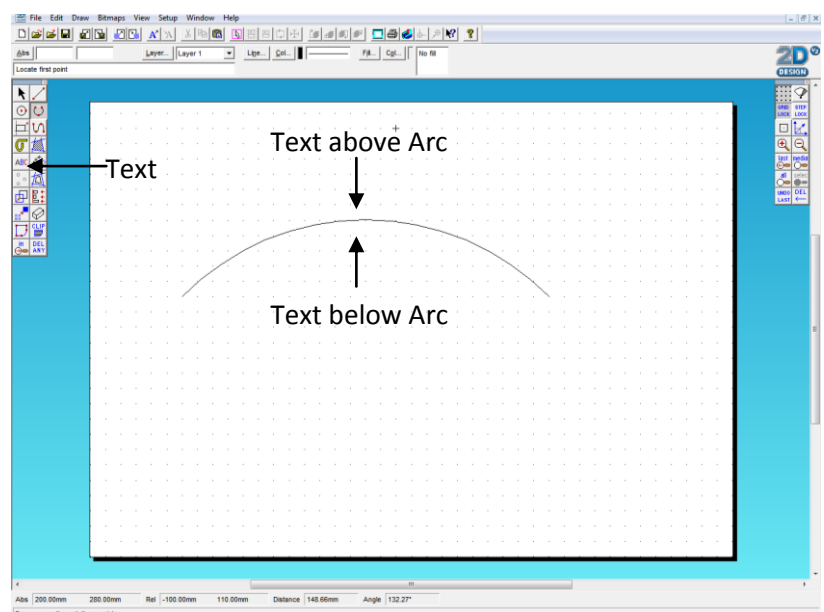
Click and hold the left mouse button

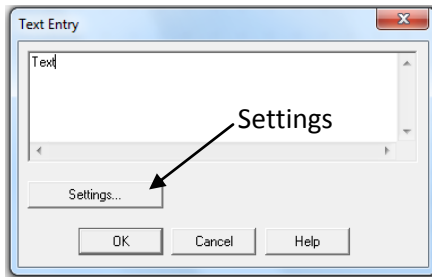


Select Draw Text Along Path

Select Arc

(Select above arc for text above or below arc for text below)





Type in your text

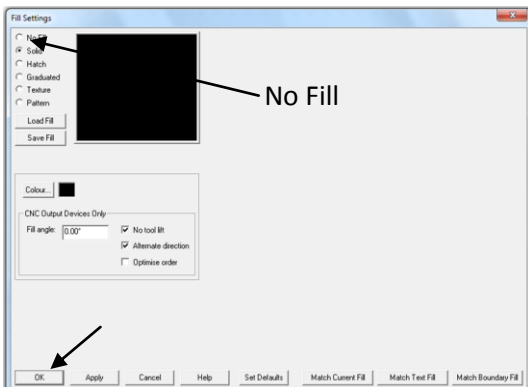
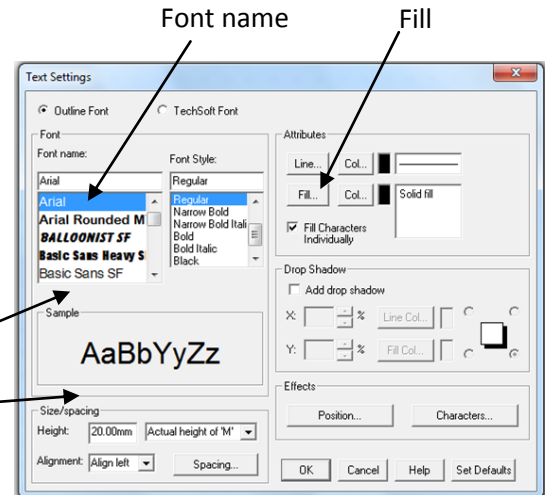
Select Settings

Click Font name in the scroll box, use the arrow keys on the keyboard to move down the names, until you find the font you wish to use.

(You can see what the font looks like in the Sample box) If you have more than one line of text you can select Alignment, then Centred.

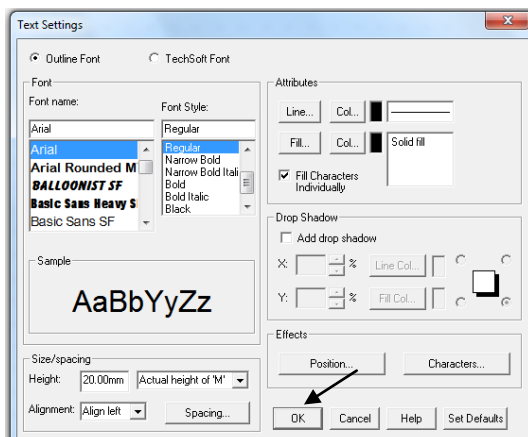
Select Fill

Alignment

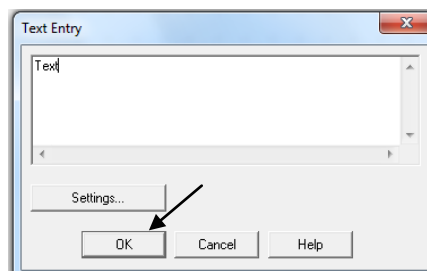


Select No Fill

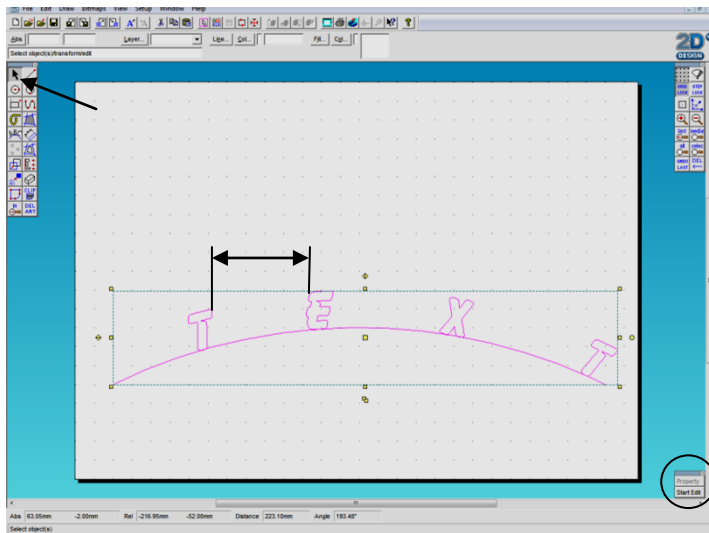
Select OK



Select OK



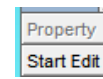
Select OK



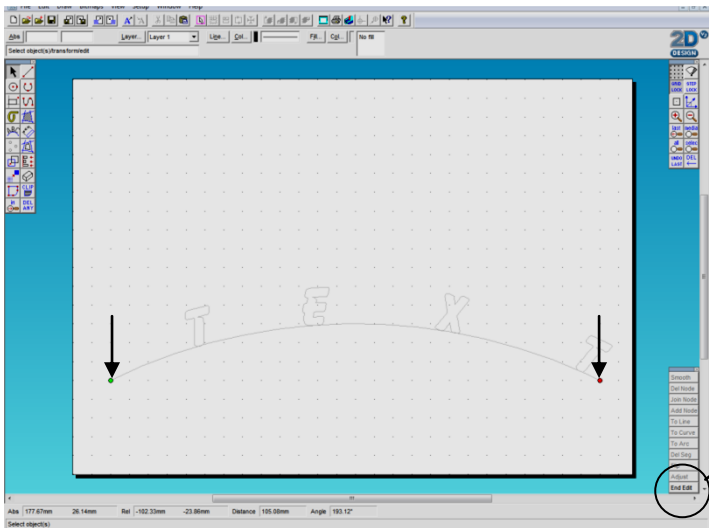
If at this point you find the space between the letters to large.

Click Select

Select the Text hold down Shift and select the Curve.



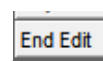
Select Start Edit.



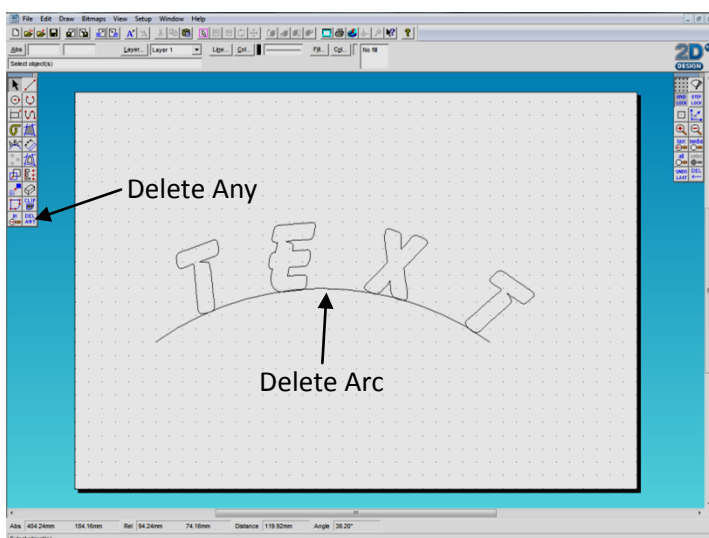
Select the Red dot and move it in to shorten the line

Repeat this for the Green dot.

You now have the text looking how you want it



Click End Edit.



Select Delete Any

Click on Arc to remove line

VECTORISING

Select an image, either cut and paste or import into 2D Design.

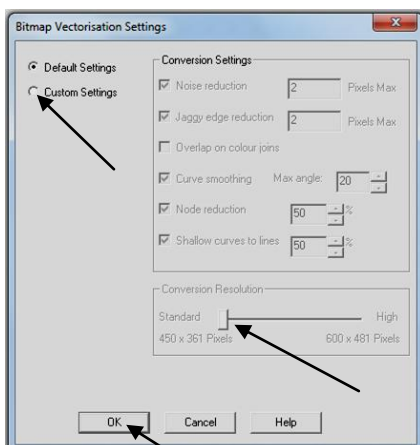
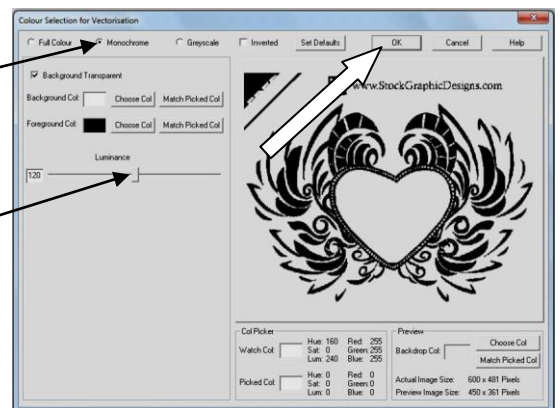


Select Vectorise and click on image

Click Monochrome

Slide left or right until image becomes clear with no broken lines or edges

Click OK



On the settings screen select Custom Settings, if no resolution bar is available skip this and the next step and just select OK.

Then slide the resolution slider as far as it will go to the right.

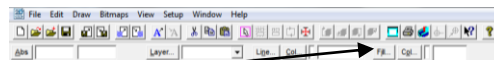
Select OK



Click on Arrow

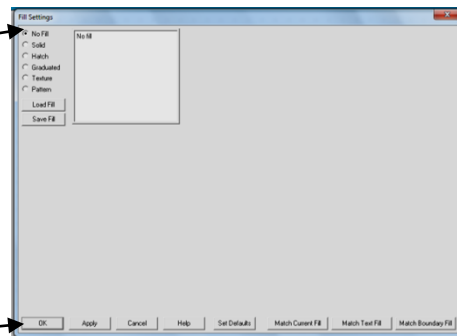


Select Picture



Select Fill

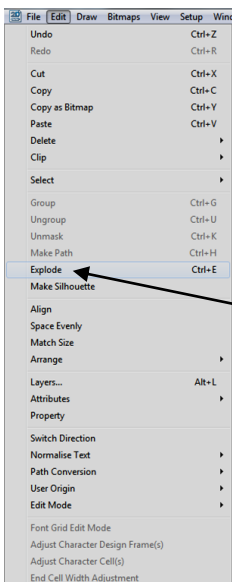
Select No Fill



Click OK

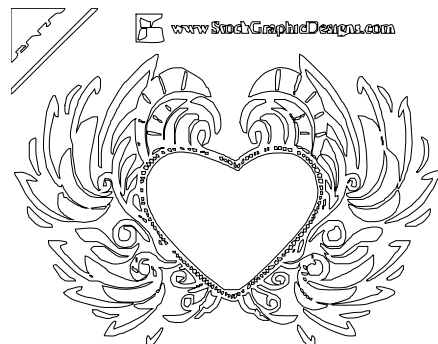
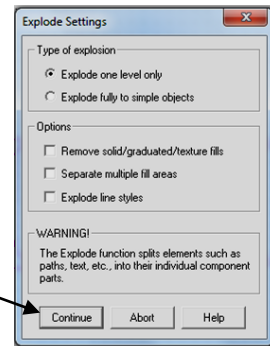


Select Edit



Select Explode

Select Continue



You can now remove unwanted lines and text.

If you find the part you wish to remove is still connected to a part you wish to keep you can repeat the last step and break it into smaller sections.

Vectorising Using 2D Design

Identify which images would be best for vectorising and why, and which would be unsuitable for vectorising and why.







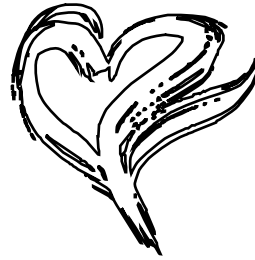




SAMPLES OF VECTORISATION



www.shutterstock.com · 42530770



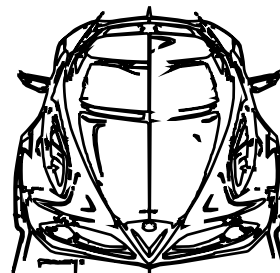
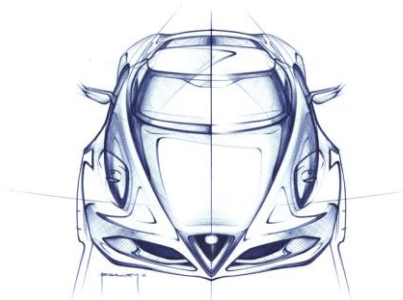
www.shutterstock.com · 42530770



www.shutterstock.com · 60663856



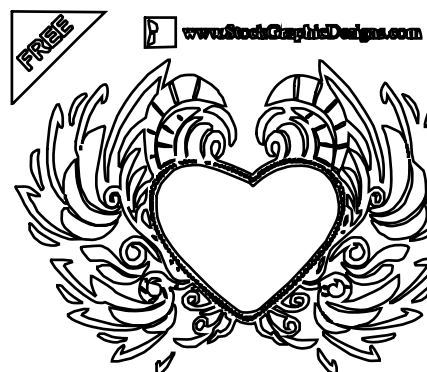
www.shutterstock.com · 60663856



FREE



www.StockGraphicDesigns.com

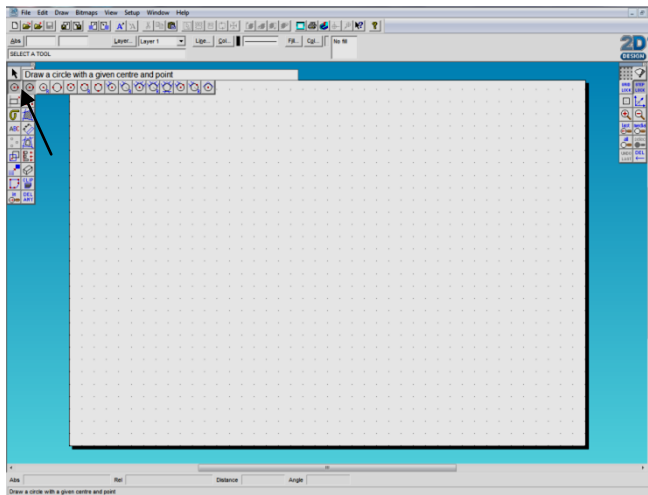


FREE

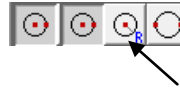


www.StockGraphicDesigns.com

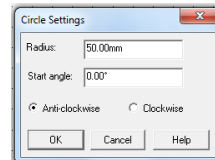
CREATING SHAPES USING CONSTRUCTION POINTS



Click and hold on the circle tool bar.



Select Draw a circle with a given centre and radius

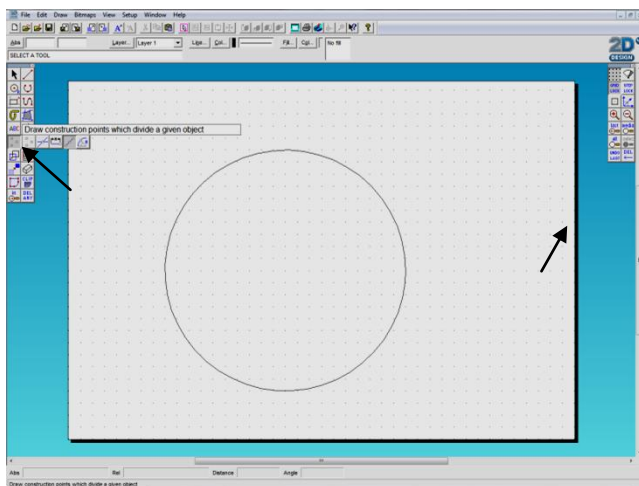
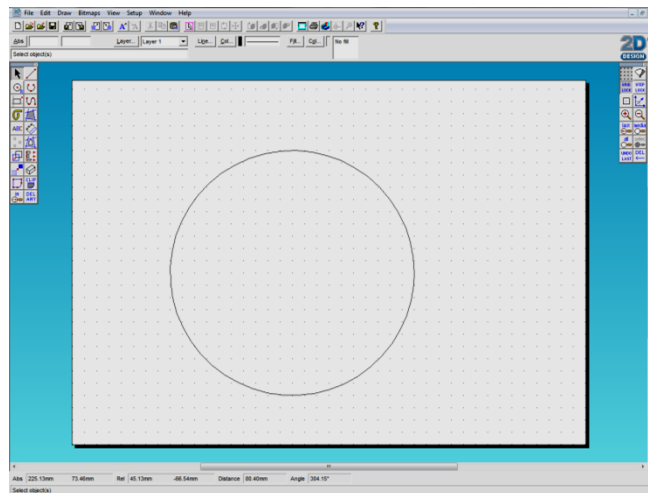


Enter the Radius of the circle required

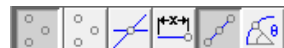
(Radius = $\frac{1}{2}$ diameter)

Click OK

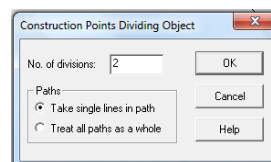
Place the circle on the drawing area and click the right mouse button to finish.



Click and hold on the construction points tools.



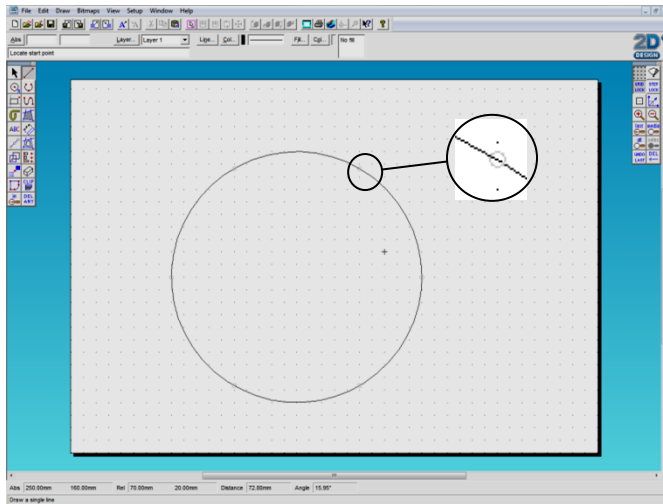
Select Draw construction points that divide a given object



Enter the number of points to divide the circle.

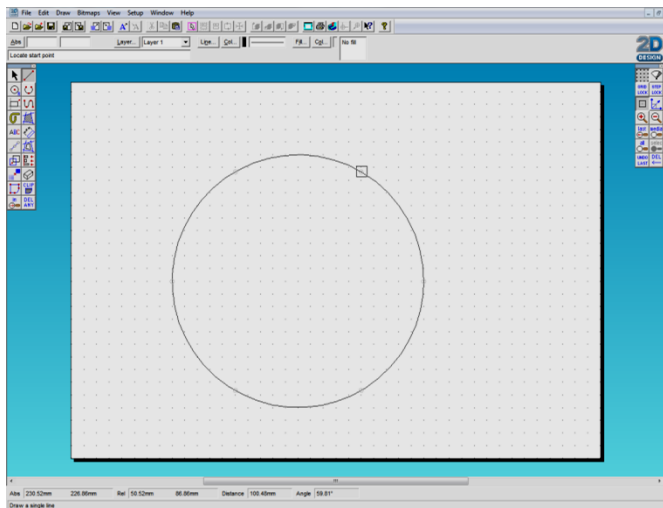
Click OK

In the case of a Hexagon the number of points is 6, an Octagon is 8 and so on. If you are constructing a star then it's the number of points required.



Click on the circle this will divide it into the required number showing light grey circles as the division points

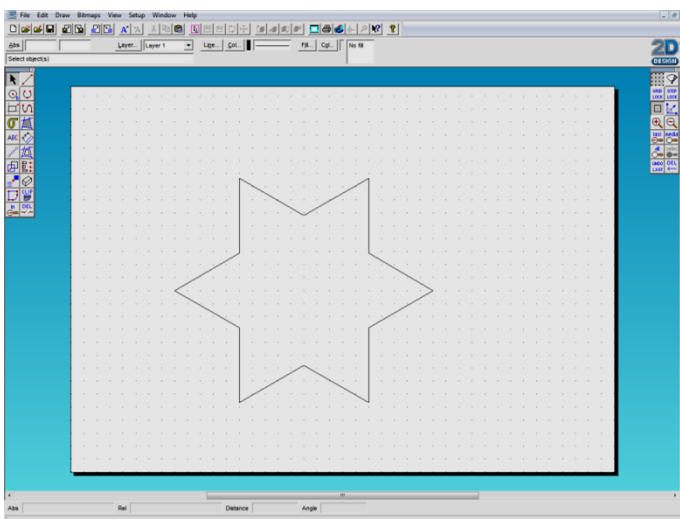
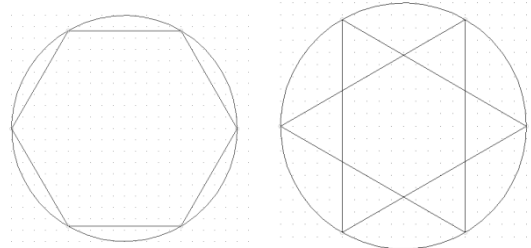
Right mouse click to finish



Select Lines

Select Attach

Attach the ends of the lines to each of the divide points to create the required shape.

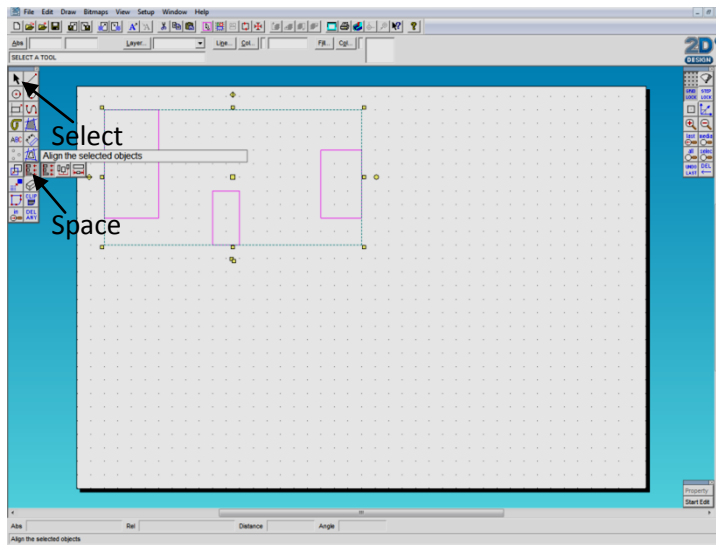


Delete the lines not required and the construction points.

Construction points can be used on lines of any type to divide it into equal sections.

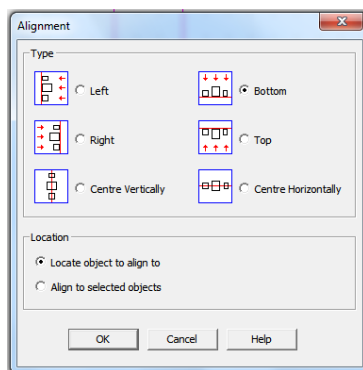
USING SPACE TOOL

Use Space tool to align object



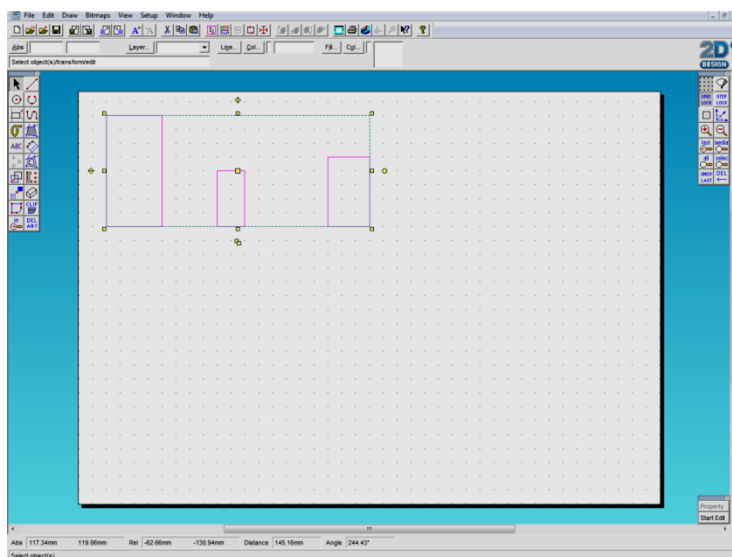
Select objects

Click on Space



Select alignment Type (eg. Left or Bottom)

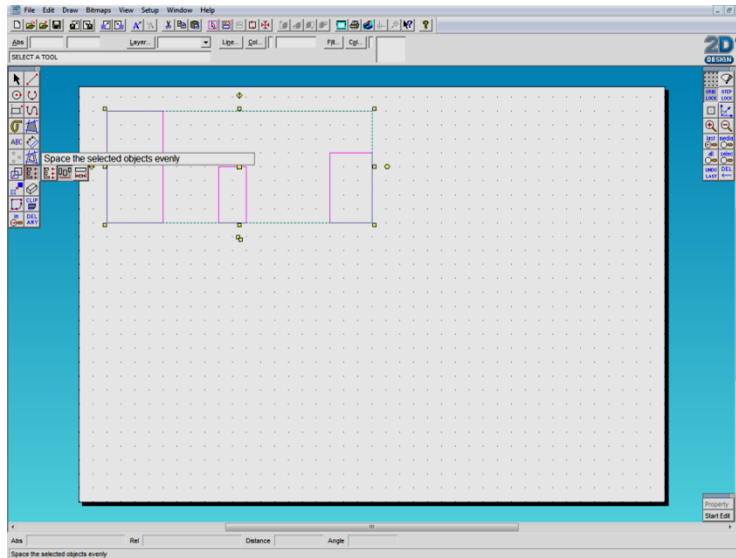
Select OK



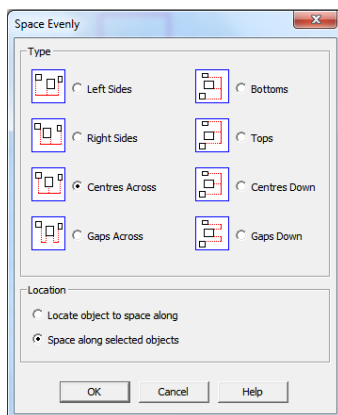
Click on object to align to

Use Space tool to space objects evenly

(This tool can only be used with three or more objects)

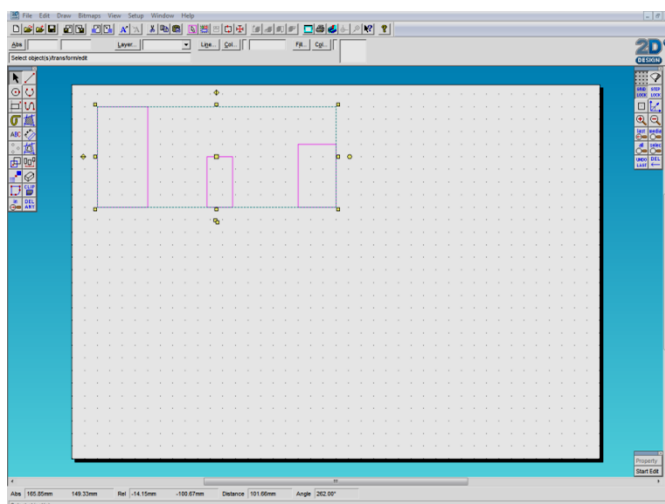


Select Space the selected objects evenly



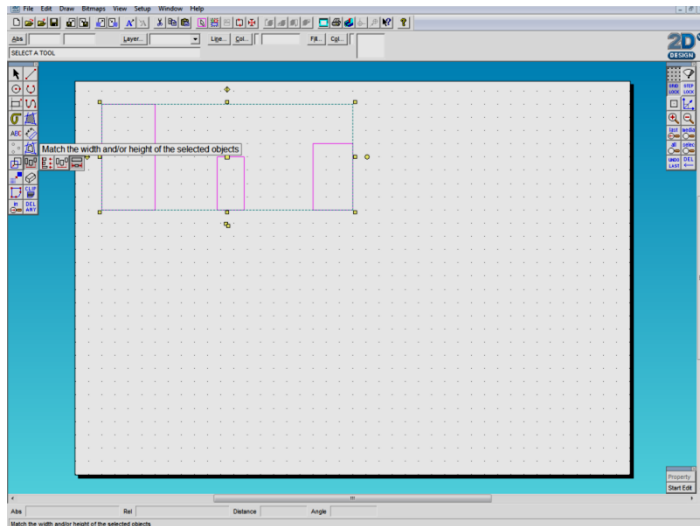
Select Type (eg. Left Sides or Centres Across)

Click OK

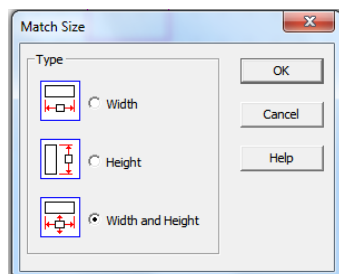


Using Space Tool to resize objects

(This tool is used to match the size of two or more objects)



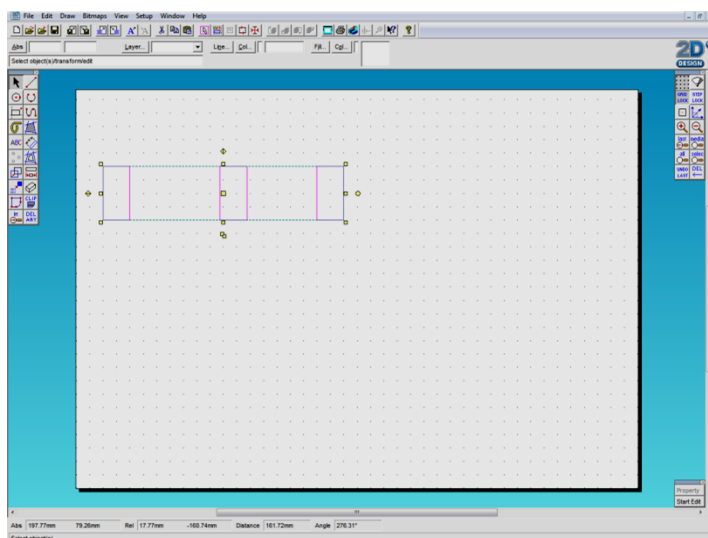
Select Match the width and/or height of the selected objects



Select Type

(Match Width, Height or Both)

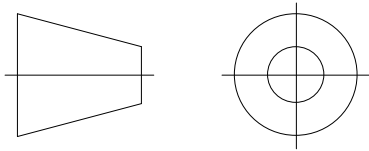
Click OK



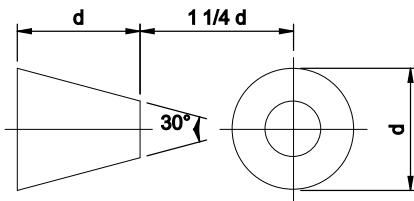
Select the object you wish to match

CREATING A DIMENSIONED DRAWING

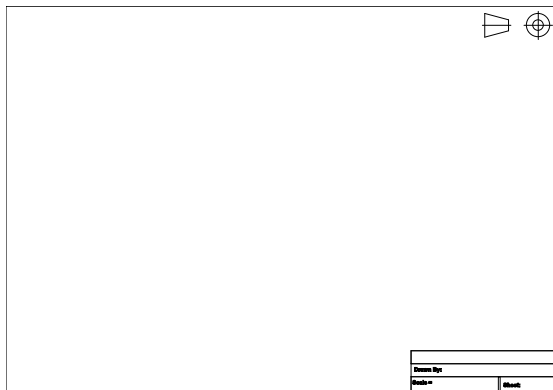
Third Angle Orthographic Projection



Symbol for third angle projection.



Create symbol using these dimensions.



The title sheet is use as the border to your drawing.

The 3rd Angle symbol is shown on the top right of the page.

The title block is shown on the bottom right of the page

A basic title block will have:

Drawn By:	
Scale =	Sheet:

The drawing title in the top box

The name of the designer in the next box

In the bottom boxes the scale (see below) of the drawing and the number of pages the drawing is on.

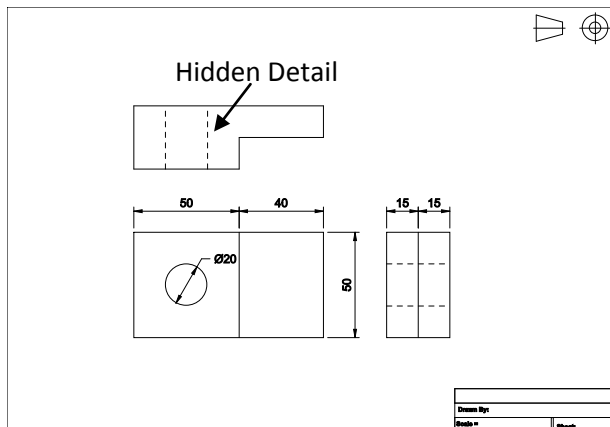
Examples of Scale

1:1 (10mm on the drawing = 10mm actual size)

1:5 (10mm on the drawing = 50mm actual size)

1:10 (10mm on the drawing = 100mm actual size)

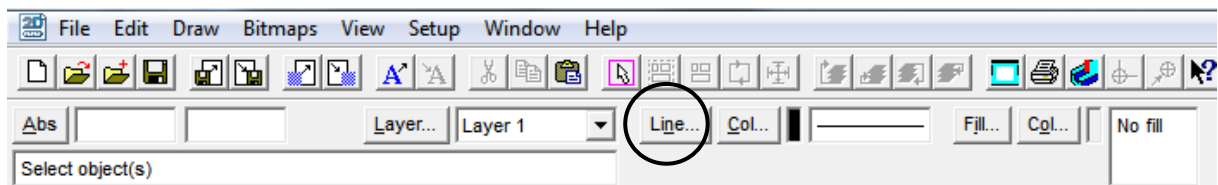
Hidden Detail



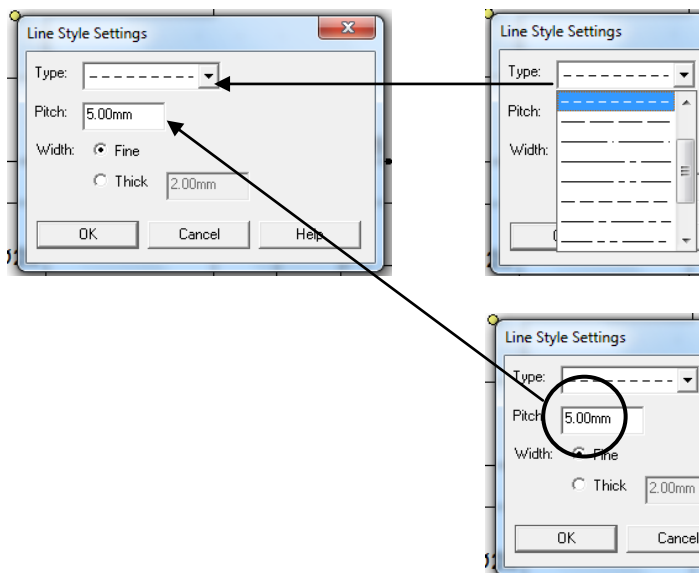
Ensure all Hidden Detail is identified using a dotted line.

Change Line Type

Select the line you want to change.



On the tool bar at the top select Line.



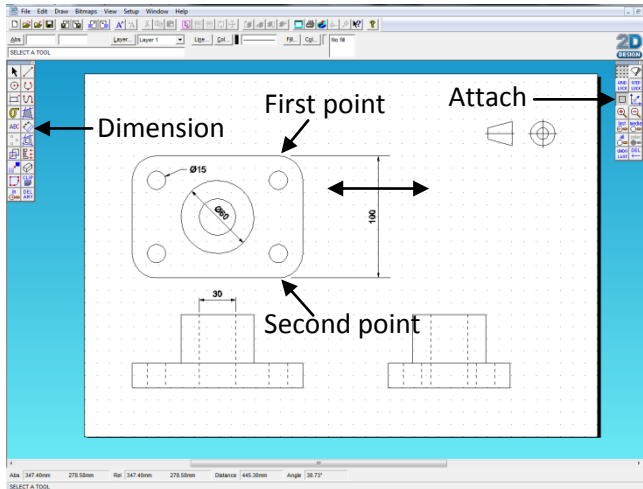
Select Type

Select Pitch

Adjust to suit the page size you are working on.

5mm should be ok for an A4 sheet

DIMENSIONING DRAWINGS



Select Dimension icon (see below)

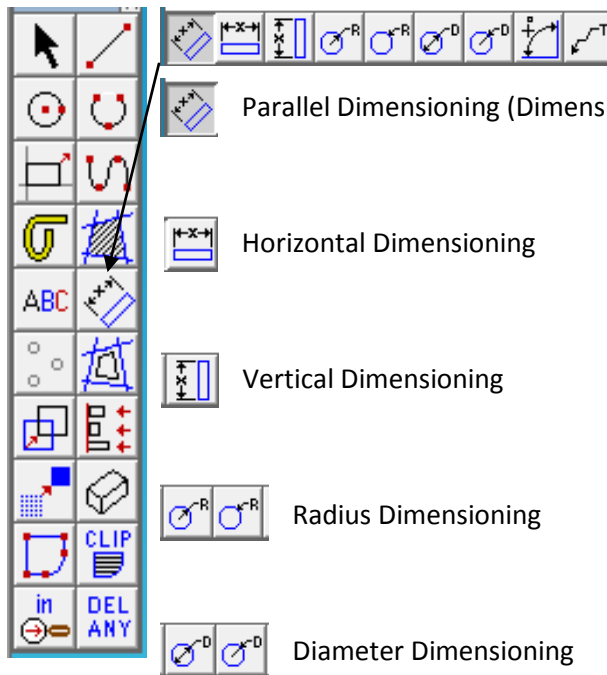
Select Attach

Select First point


Select Second point


Move dimension line to the required position and click mouse button.


Dimensioning Tool Bar

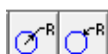


Click and hold down mouse button.


 Parallel Dimensioning (Dimension of a Angled Line).


 Horizontal Dimensioning

 Vertical Dimensioning

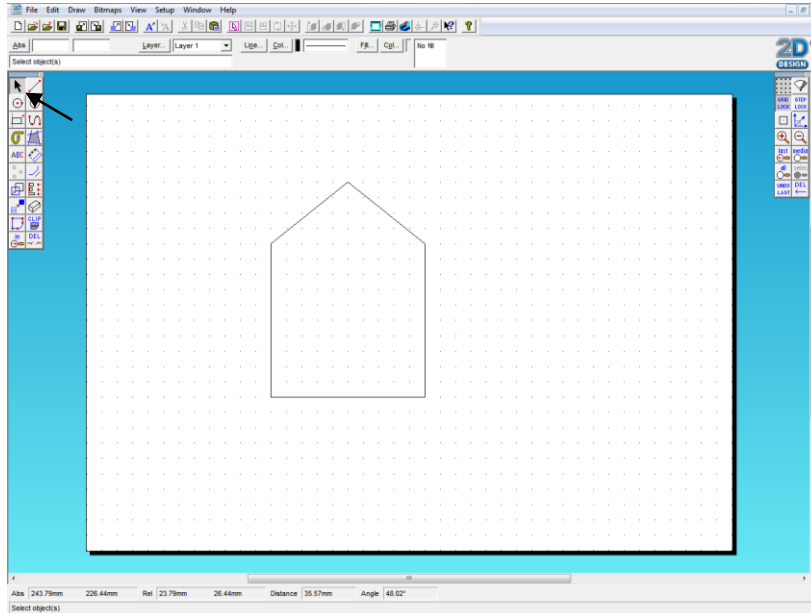
 Radius Dimensioning

 Diameter Dimensioning

 Angular Dimension Between two lines

 Draw a Leader Line (A arrowed line to show notes of information about a point on the drawing).

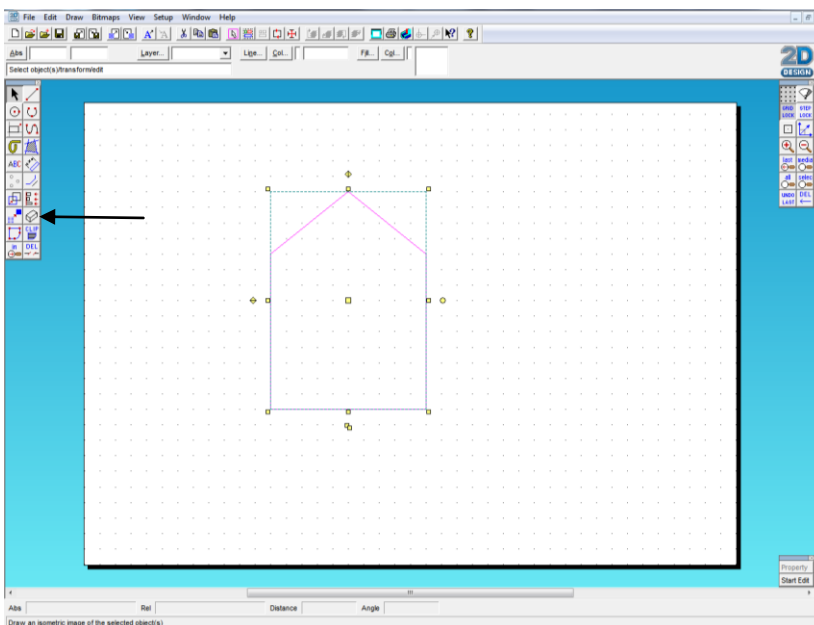
3D EFFECTS



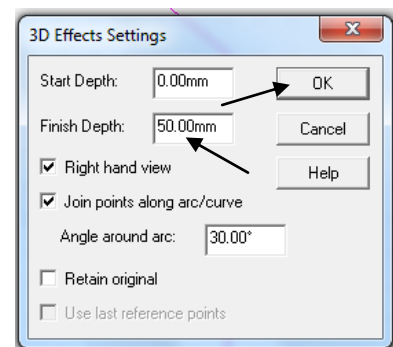
Draw your 2D shape

Click Select

Select the drawing



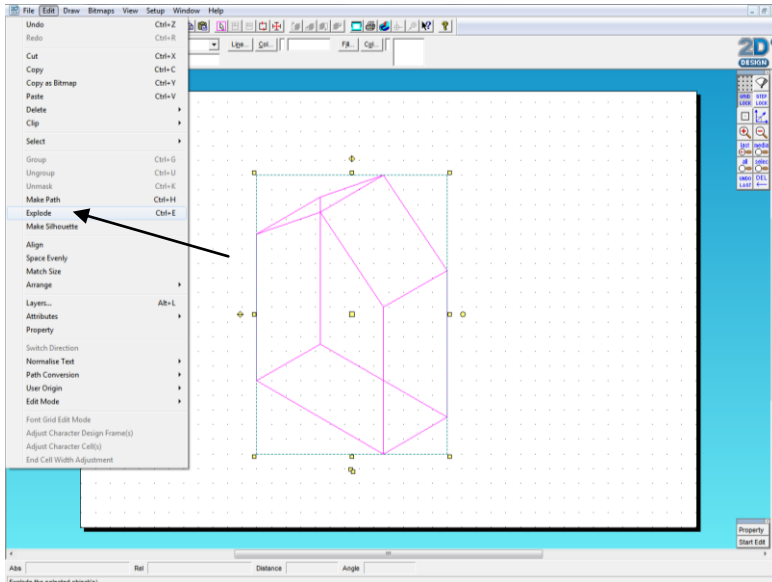
Select 3D Effects



Enter Finish Depth

Click OK

Select the point of rotation

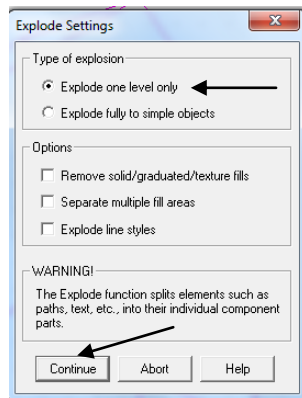


Click Select

Highlight drawing

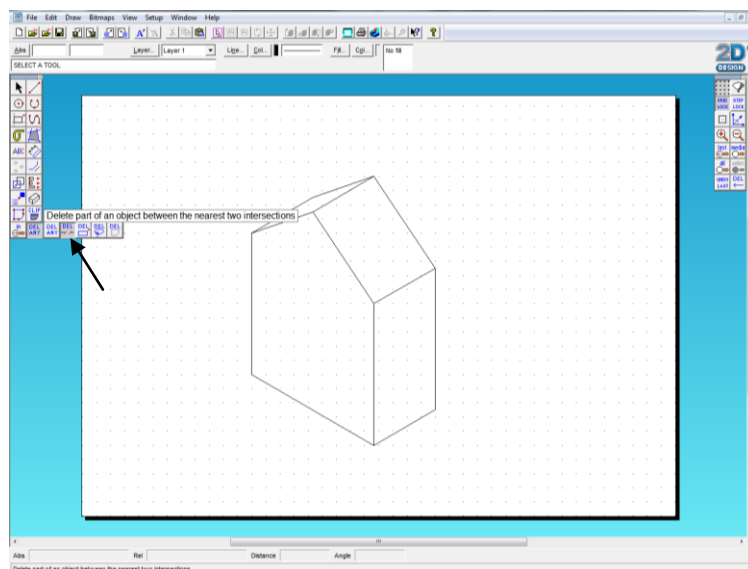
Select Edit

Then Explode



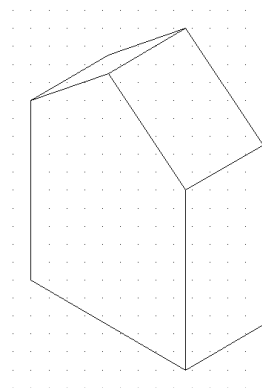
Select Explode one level only

Click Continue

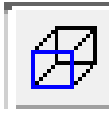


Select Delete part of an object

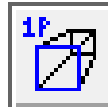
Remove the hidden lines



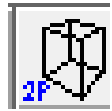
Other 3D effects available are:



Draw an oblique image of the selected object(s)



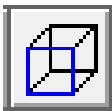
Draw a perspective image of the selected object(s) with 1 vanishing point



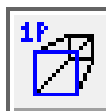
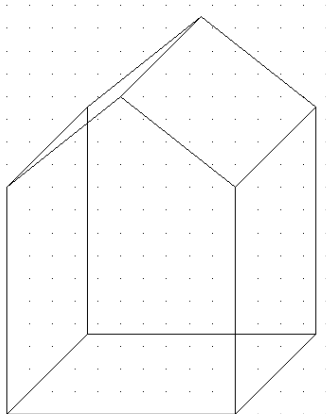
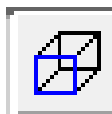
Draw a perspective image of the selected object(s) with double vanishing points



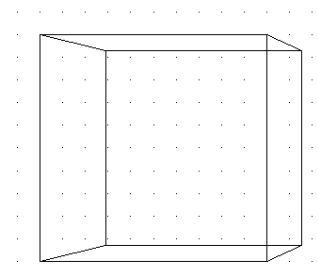
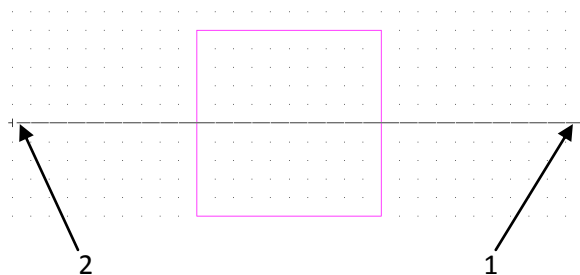
Draw a 3D image by revolving the selected object(s) about an axis



Draw an extruded image of the selected object(s)

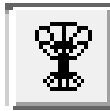
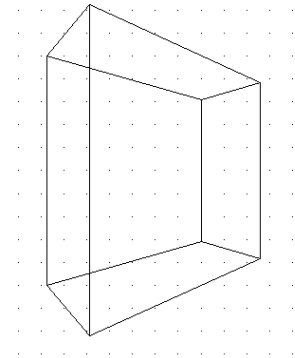
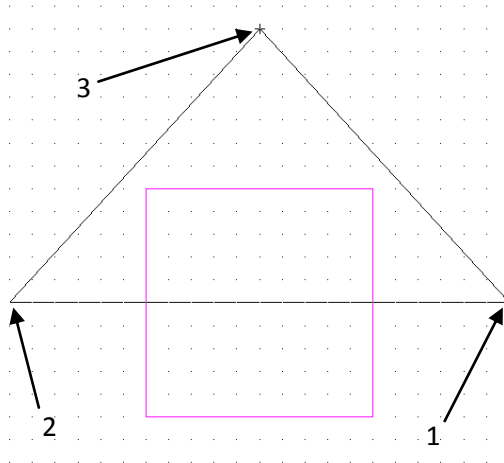


Select Vanishing point 1 then Rotation point 2

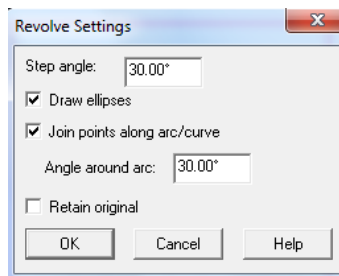




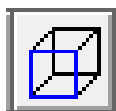
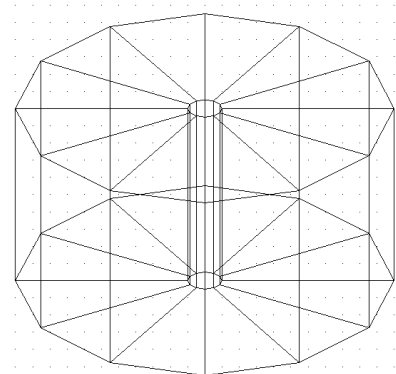
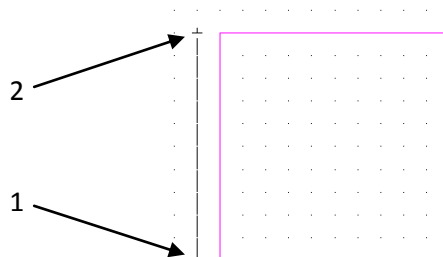
Select Vanishing point 1, Vanishing point 2 then the Rotation point 3



Select Step Angle



Select Rotation point 1 then Rotation point 2



Select point 1 then the point 2 to extrude

