ORTHOGRAPHIC DRAWING

This mobile revision pdf is based on detailed work found in the 'ORTHOGRAPHIC DRAWING' section.
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ORTHOGRAPHIC DRAWING

INTRODUCTION TO THIRD ANGLE ORTHOGRAPHIC DRAWING

Orthographic drawing is a way of drawing a three dimensional object. Normally the object is drawn as three separate, related views - Front View, Side View and Plan View.

The example below shows a simple shaped block, with a hole drilled all the way through.

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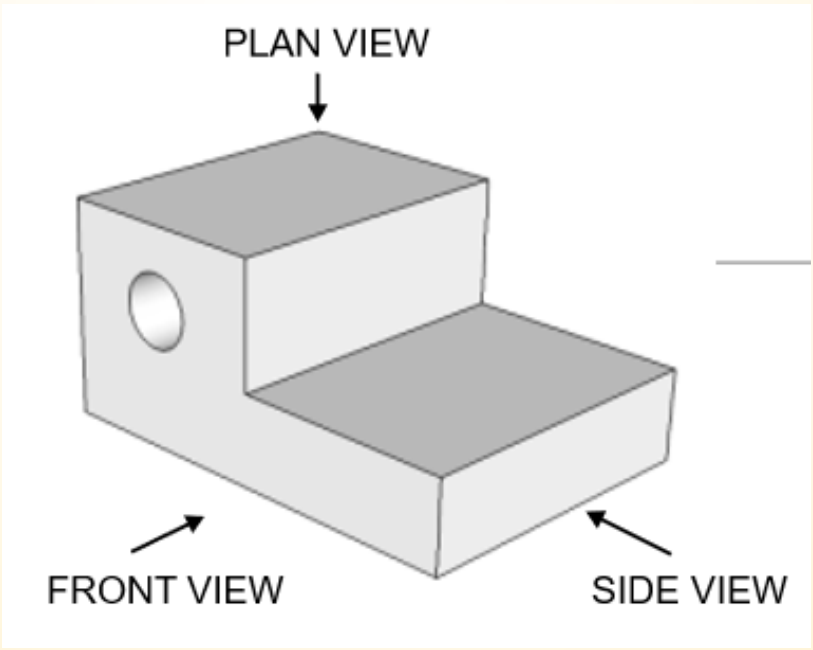

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The front view, is a drawing of the block, as if you are looking directly at the front of the object. The side view, is a drawing of the block, when it has been rotated so that one of its sides is now directly in view. The plan view, is a 'birds eye' view, from above. Dotted lines represent 'hidden detail'. In this case they represent the hole, through the block/object.

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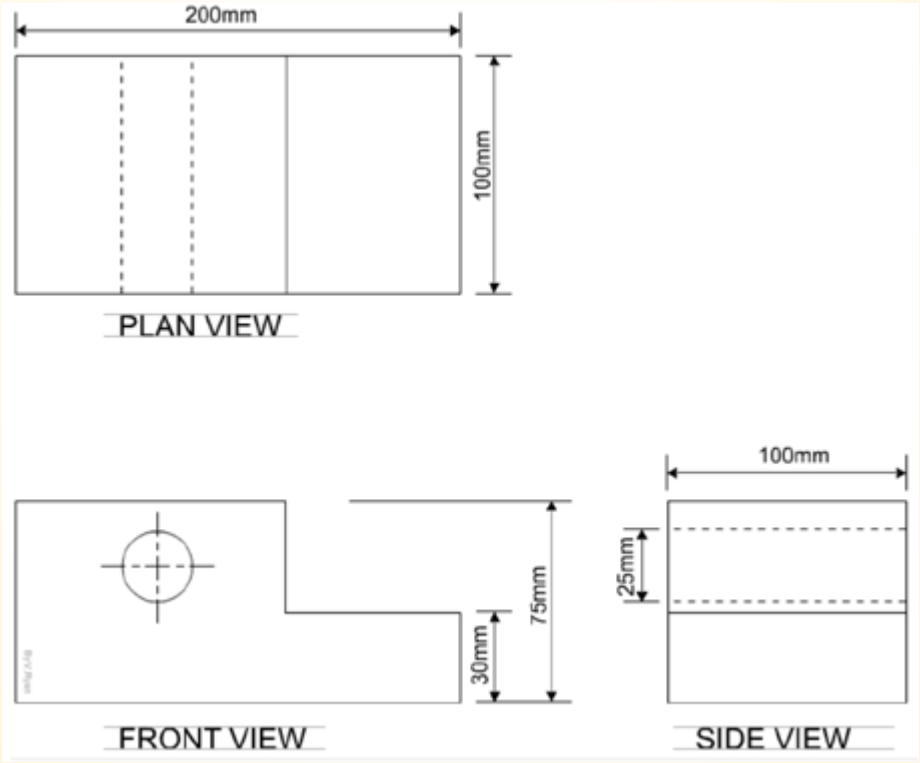

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THIRD ANGLE - ORTHOGRAPHIC FURTHER EXPLANATION

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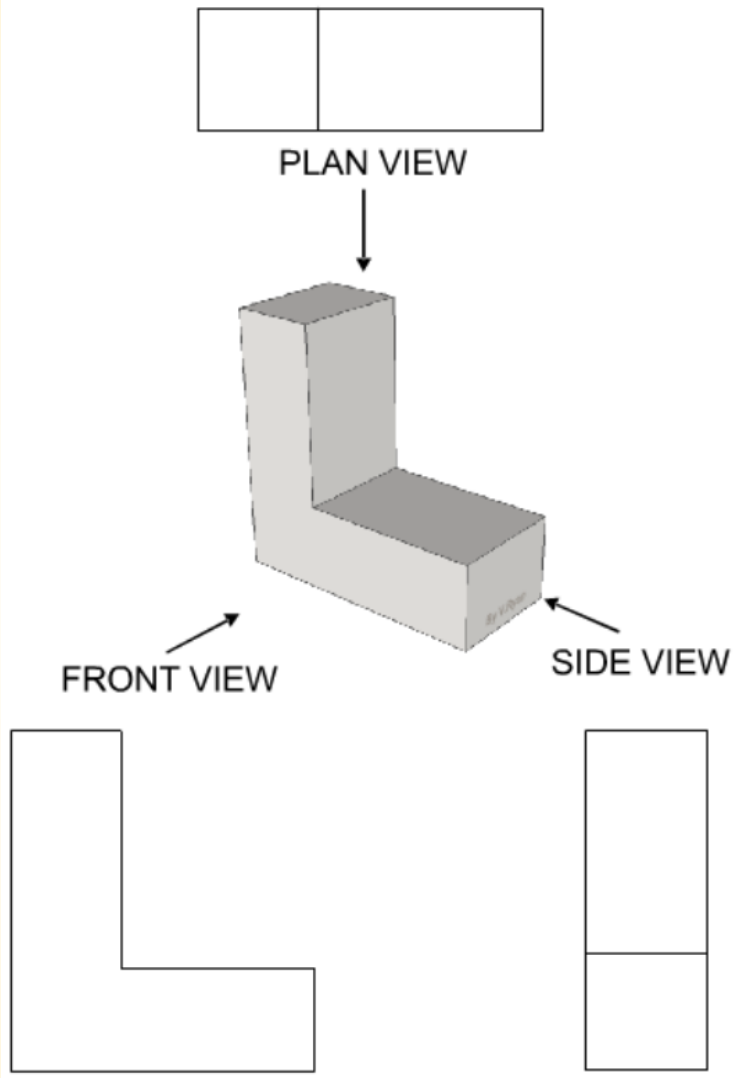

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The correct position of each view is shown below. They have been drawn very accurately, using T-Squares and set squares.

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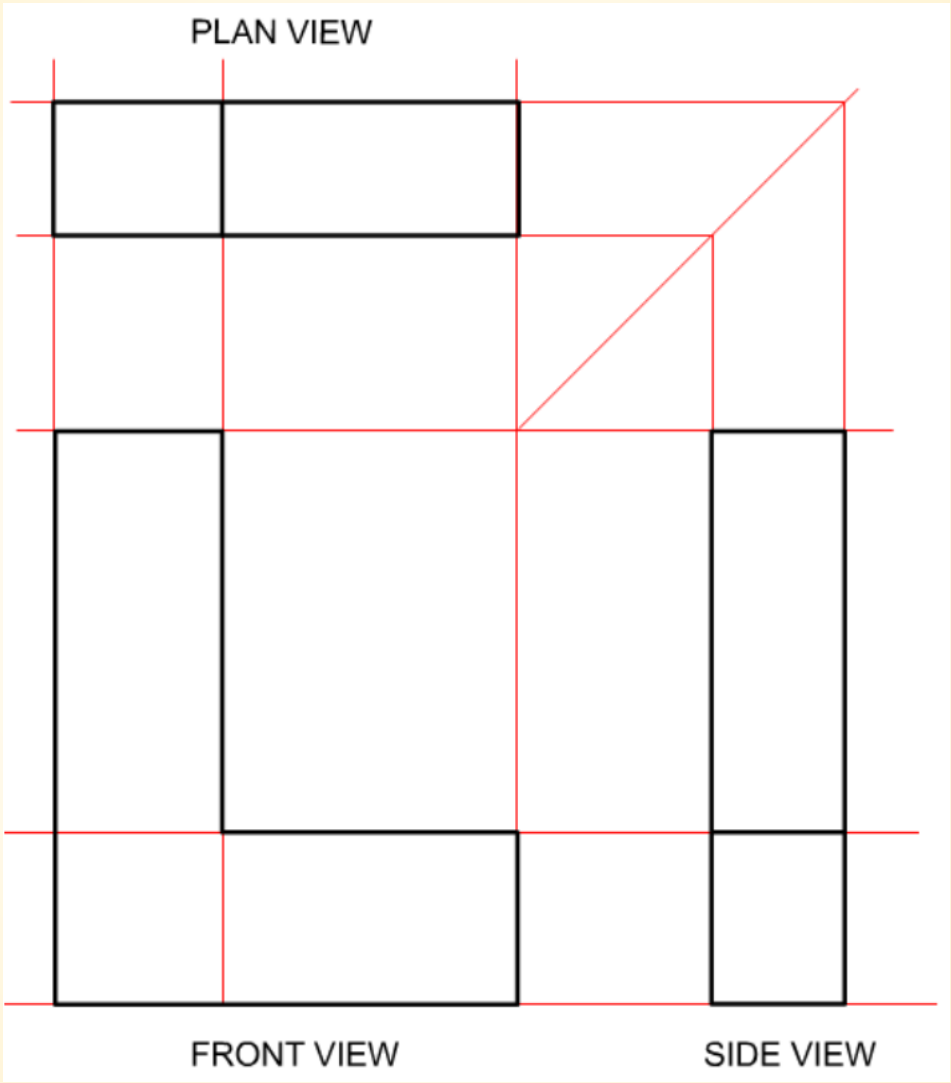

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THIRD ANGLE ORTHOGRAPHIC PROJECT SYMBOL

When the symbol (seen below) is seen alongside an orthographic drawing, it is clearly stating that the drawing is in ‘third angle projection’.

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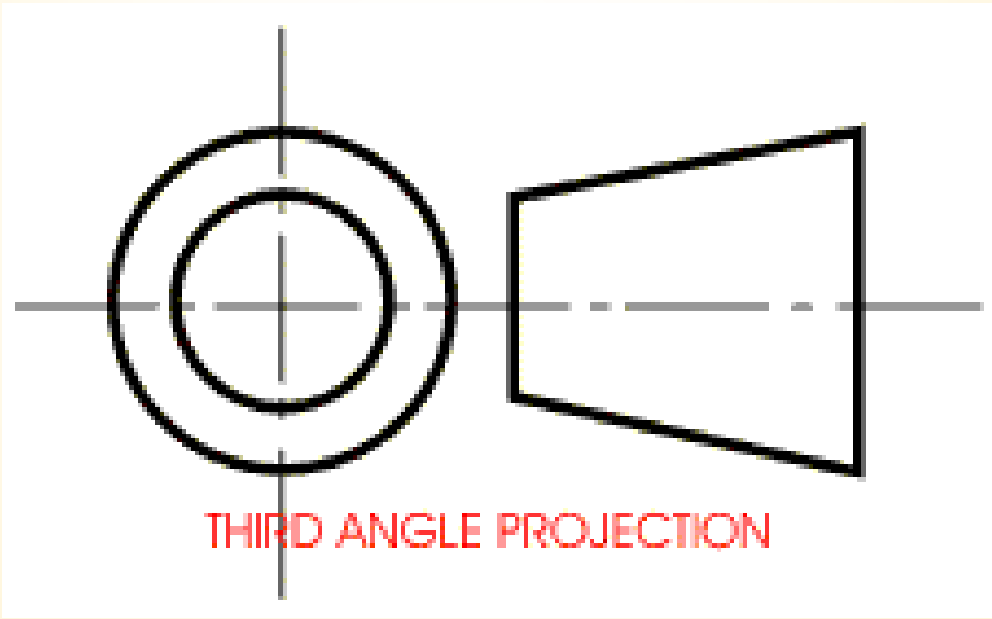

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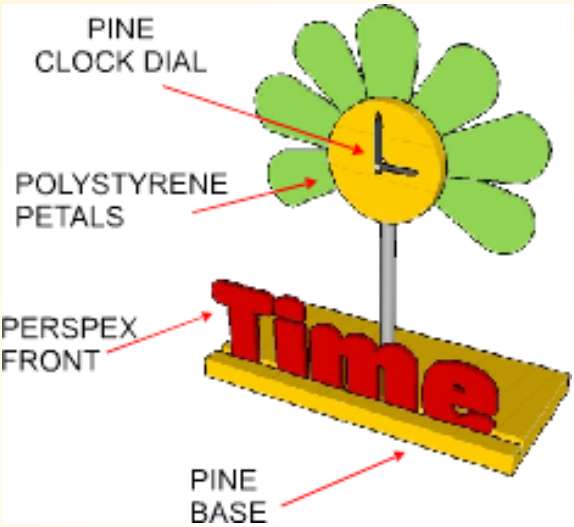
A WORKING DRAWING – 3RD ANGLE ORTHOGRAPHIC

A simple design for a clock is seen below. The design is based on a flower and consequently the clock dial has petals surrounding it



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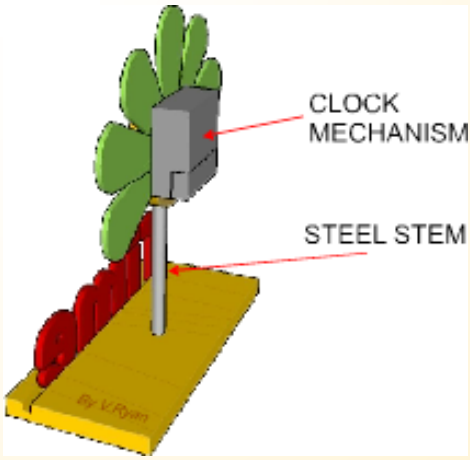

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This time the clock is drawn in orthographic projection (Third Angle Projection). Three views have been drawn and they are the front, side and plan elevations. This style of accurate drawing is needed when the item is to be manufactured.

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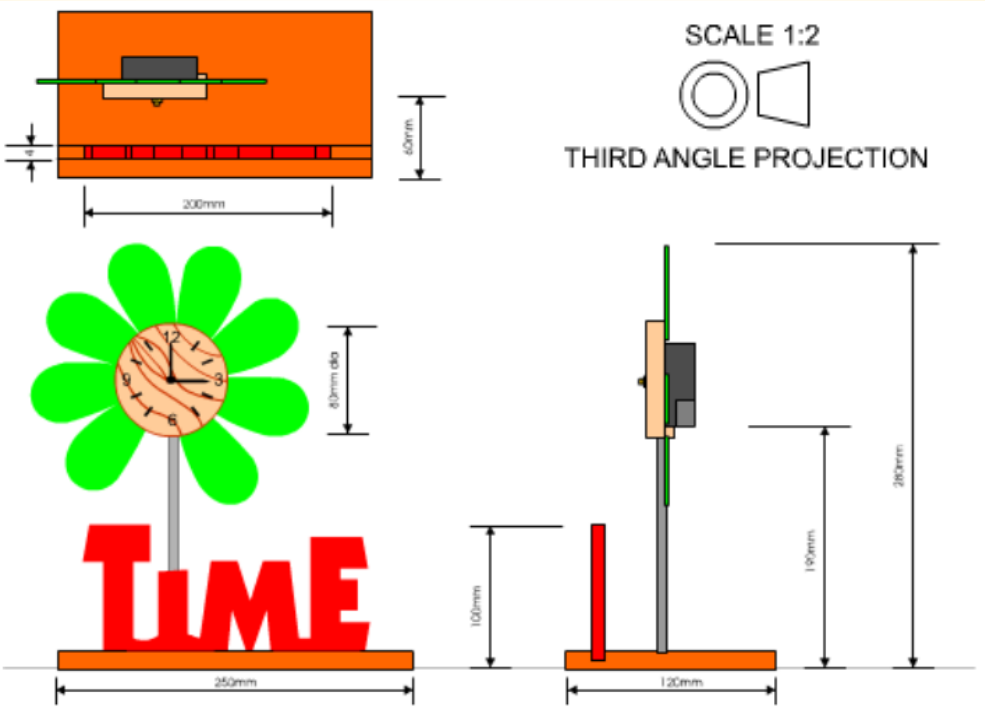

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This amended working drawing (below), has only two elevations of the clock. A plan elevation was not required, because the front and side elevations have enough detail and information to make it possible to manufacture the clock. A Parts List has been included (see next slide for an explanation). Notice – all the parts are numbered.

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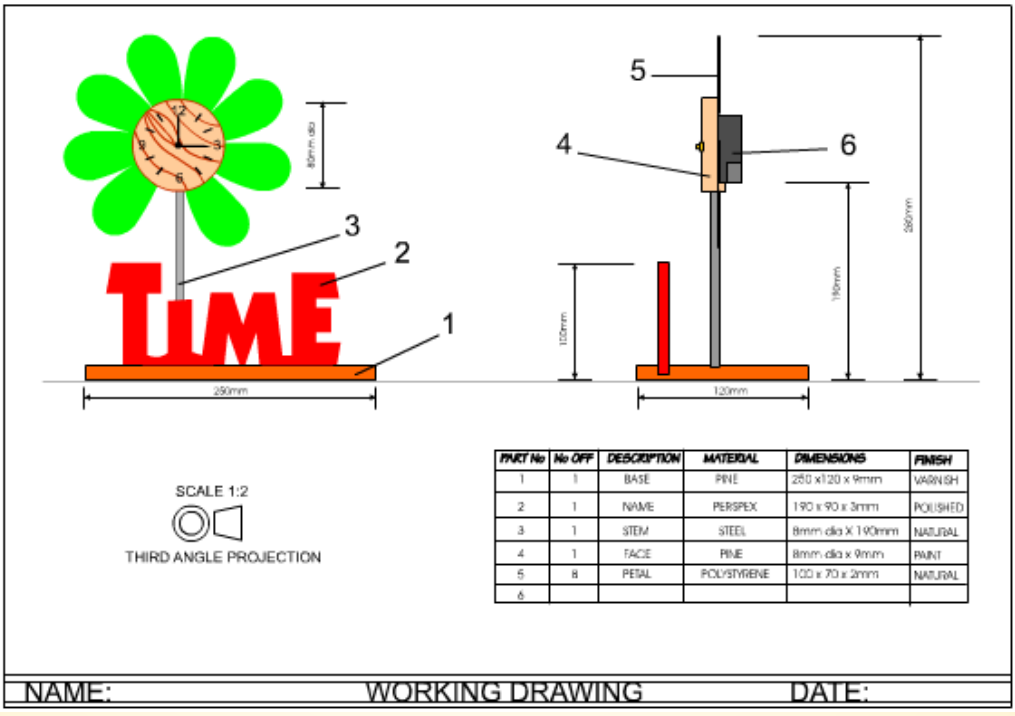

PART No	No OFF	DESCRIPTION	MATERIAL	DIMENSIONS	FINISH
1	1	BASE	PINE	250 x 120 x 9mm	VARNISH
2	1	NAME	PERSPEX	190 x 90 x 3mm	POLISHED
3	1	STEM	STEEL	8mm dia X 190mm	NATURAL
4	1	FACE	PINE	80mm dia x 9mm	PAINT
5	8	PETAL	POLYSTYRENE	100 x 70 x 2mm	NATURAL
6					

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PART LISTS

A parts list has been added. Each part has been numbered on the drawing and listed in a table. A simple description has been added as well as material, overall dimensions and the finish to be applied. This gives the manufacturer all the information required to manufacture the clock.

Tap the image for information / an exercise

PART No	No OFF	DESCRIPTION	MATERIAL	DIMENSIONS	FINISH
1	1	BASE	PINE	250 x120 x 9mm	VARNISH
2	1	NAME	PERSPEX	190 x 90 x 3mm	POLISHED
3	1	STEM	STEEL	8mm dia X 190mm	NATURAL
4	1	FACE	PINE	8mm dia x 9mm	PAINT
5	8	PETAL	POLYSTYRENE	100 x 70 x 2mm	NATURAL
6					

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DIMENSIONS

An orthographic drawing is usually the last drawing, before manufacture and so dimensions must be clearly presented and understood. Dimensions are drawn in a particular way as shown on the drawing below.

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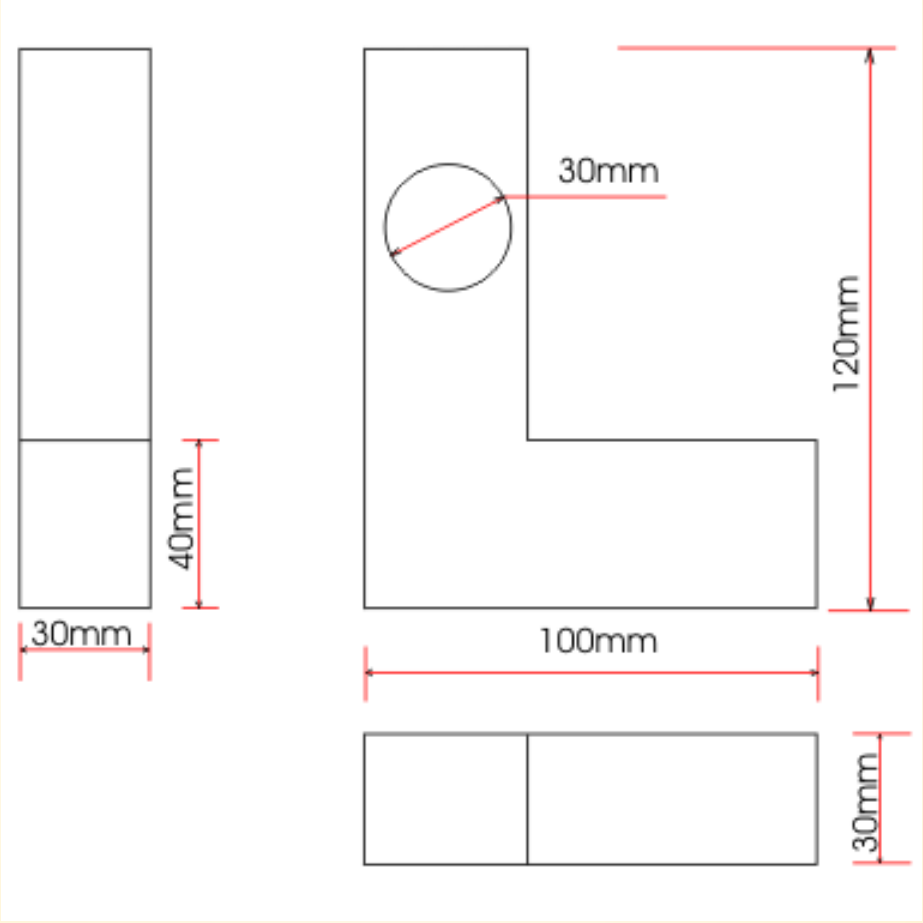

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DIMENSIONS

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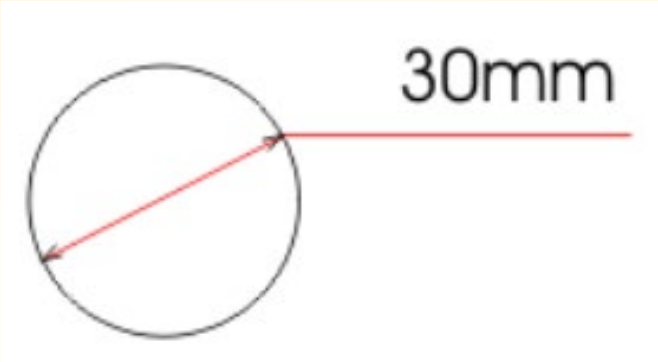
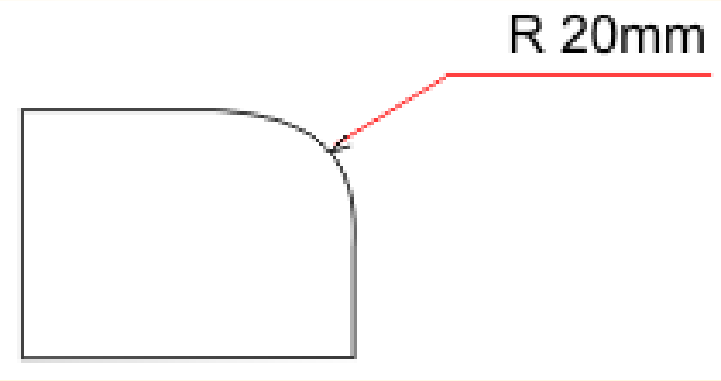
This type of dimension is normally used for a circle. The unusual symbol (zero with a line through it) is simple way of writing diameter.



Curved corners can be dimensioned like this. 'R' means radius (the compass setting).



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DIMENSIONS

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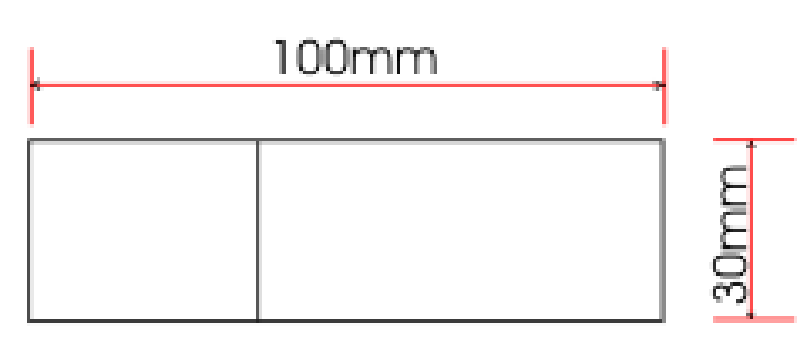
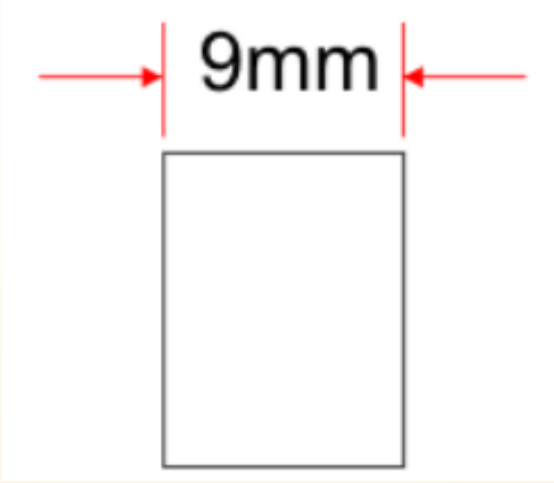
Example of a standard dimension. The dimension is drawn quite faint with the exception of the number and arrow heads.



If a measurement is 9mm or smaller the dimension is drawn in a slightly different way. The arrows point inwards, towards the number.



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MOBILE PHONE EXAMPLE

This emergency mobile phone has been developed for hikers / walkers and it is a simple design. It should only be used in the event of an accident or getting lost - when the emergency services may be needed for rescue.

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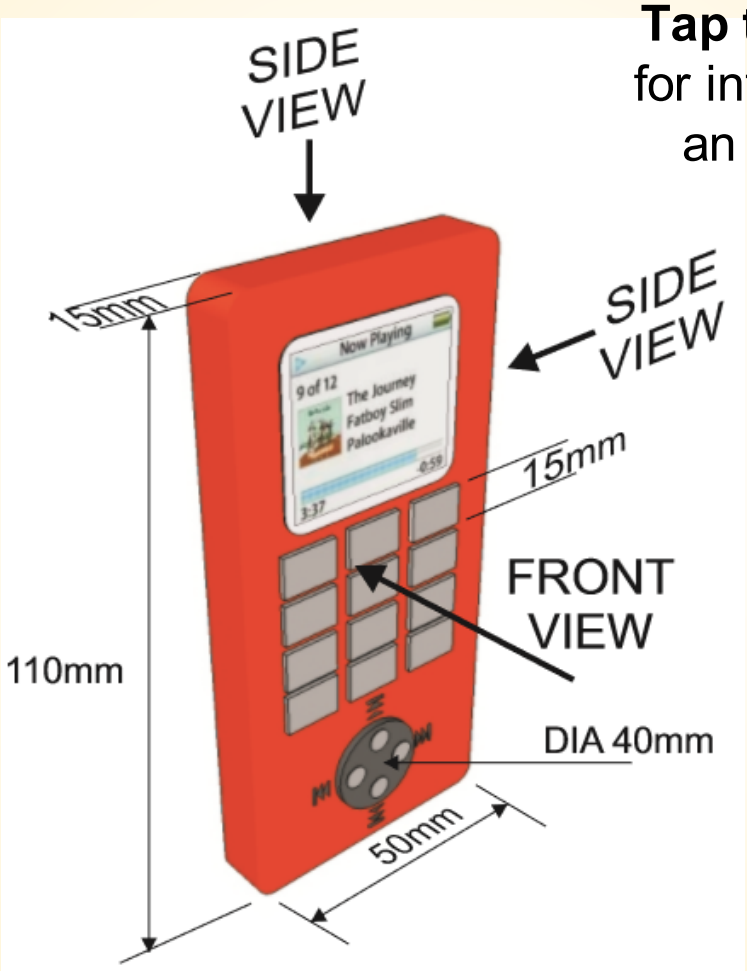

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When finished, it should look like this. The following slides demonstrate each stage of construction

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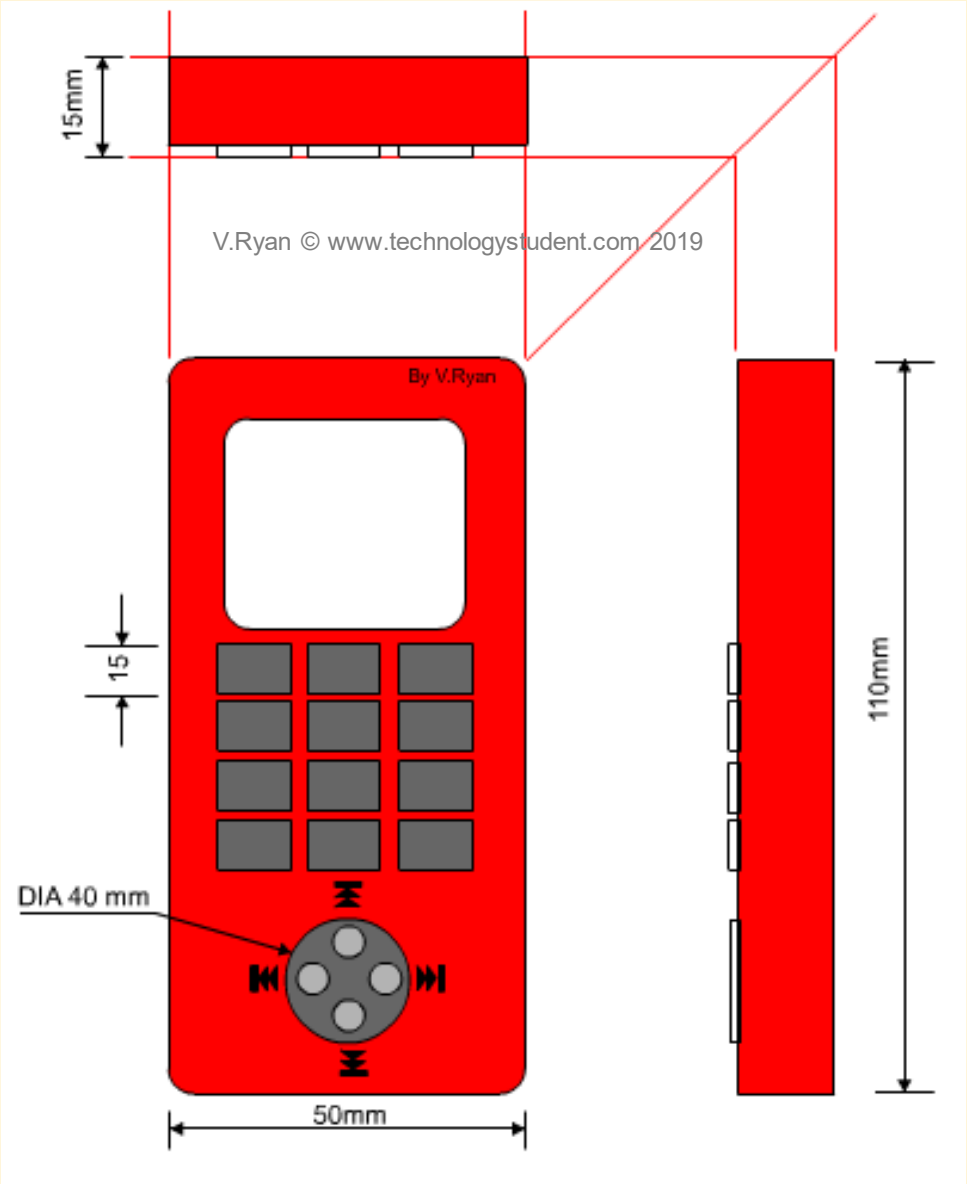

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1. Draw a faint horizontal base line. The front and side view will be drawn resting on this line. It ensures that these two views are in line and level.

HINT - Draw very faintly using a 2H pencil. Draw the outline of the front view.

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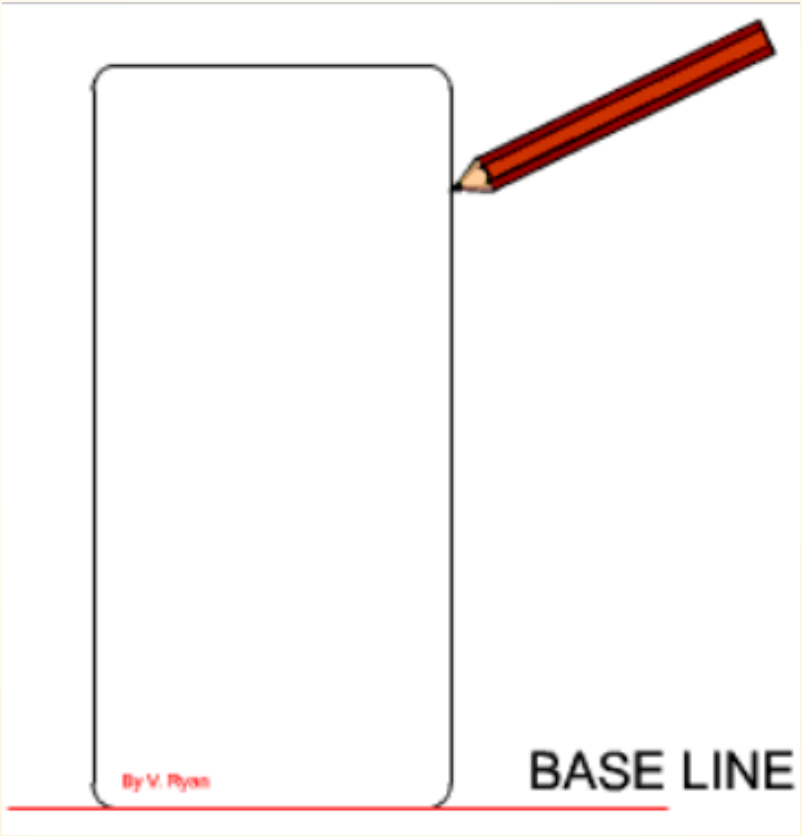

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2. Draw a grid very faintly. This will be for the buttons / keys. The lines must be drawn precisely - horizontal and vertical lines must be accurate.

Once the grid is drawn add the buttons.

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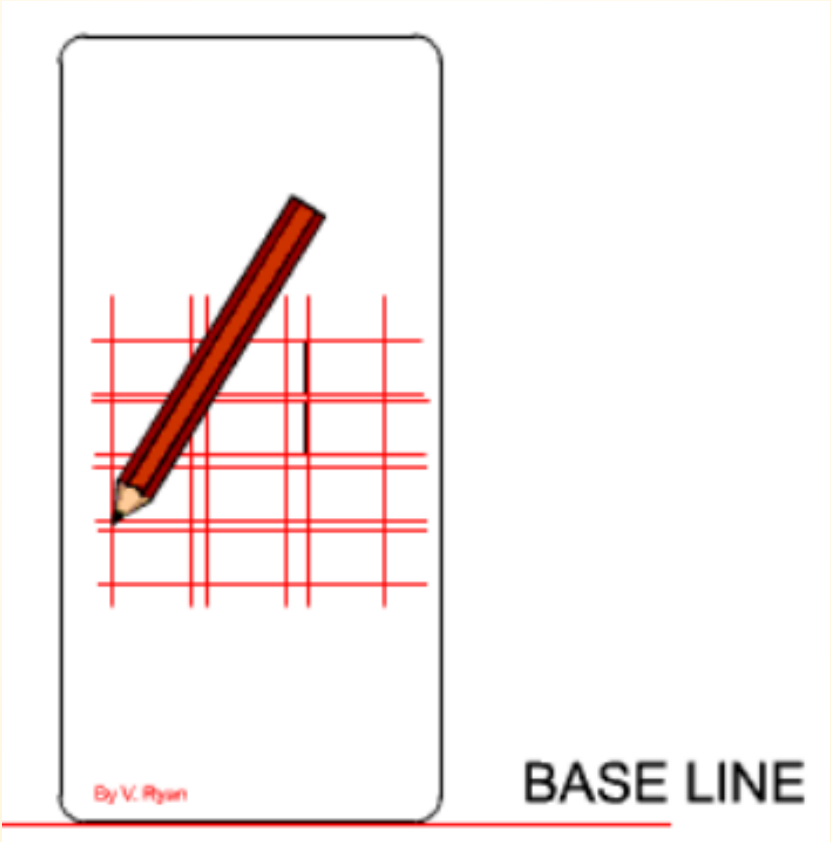

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3. Draw the rectangular liquid crystal display and the circular control.
Draw the large circle using a compass.
Smaller circles are best drawn using a circle template.

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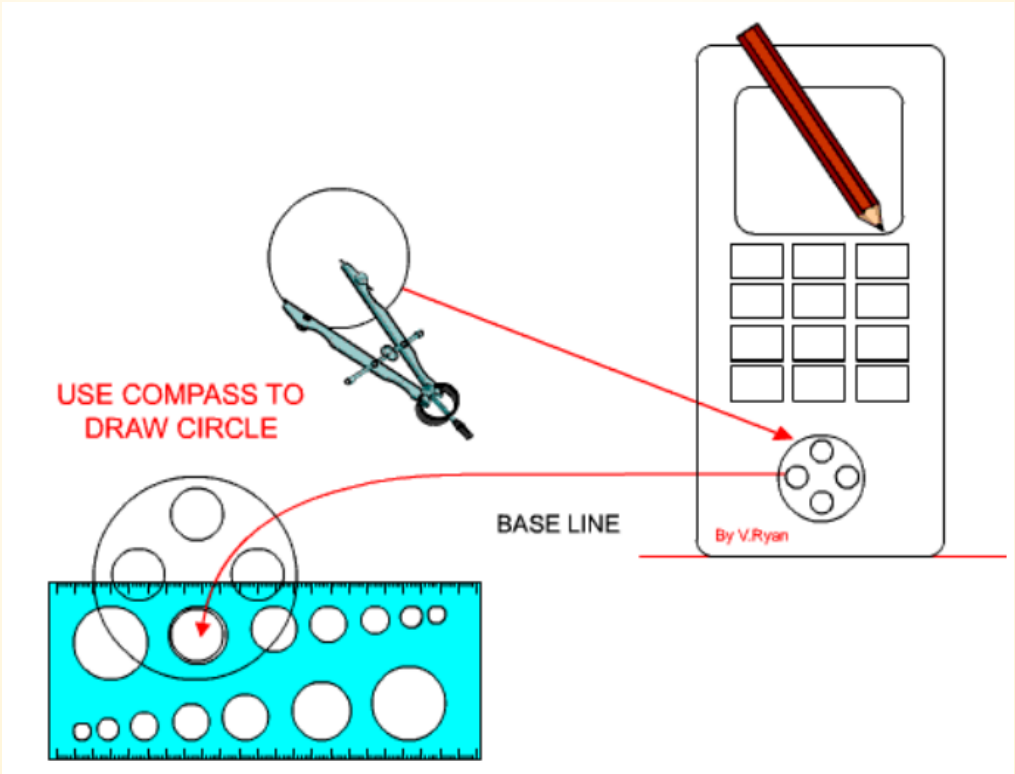

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4. Draw the left / right / up / down keys. These are quite small but they must be drawn precisely.

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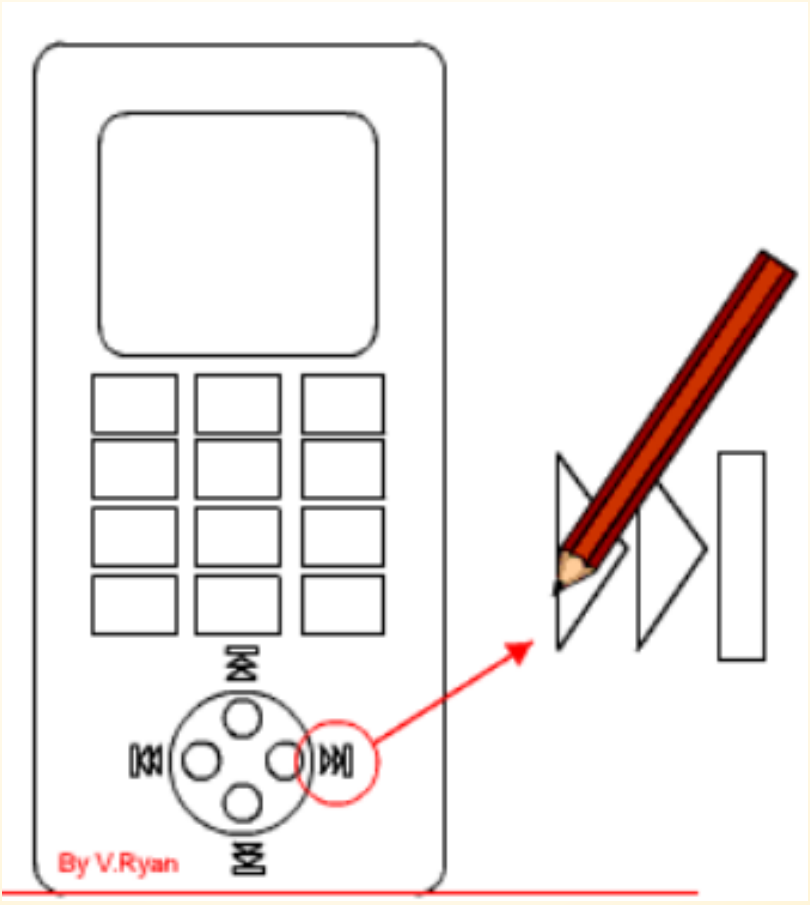

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5. Draw the side view being careful to line up the buttons so that the buttons on the side view are level with those on the front view.

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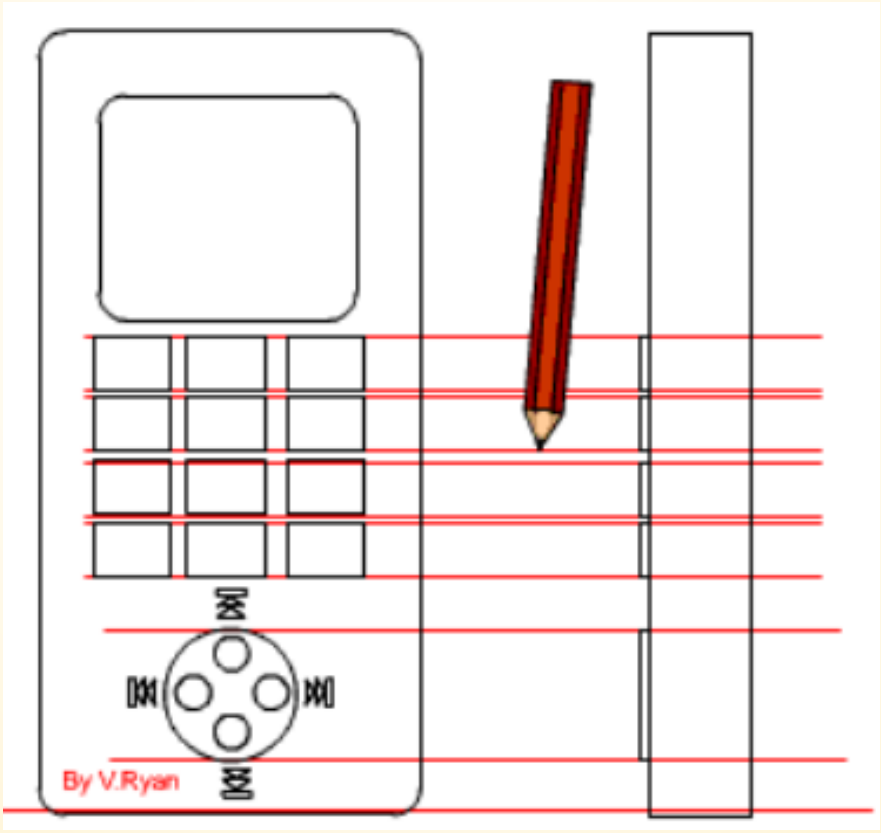

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6. Draw a 45 degree line from the top right corner of the front view. Project the thickness of the mobile phone up to the angled line and across the form the outline of the plan view.

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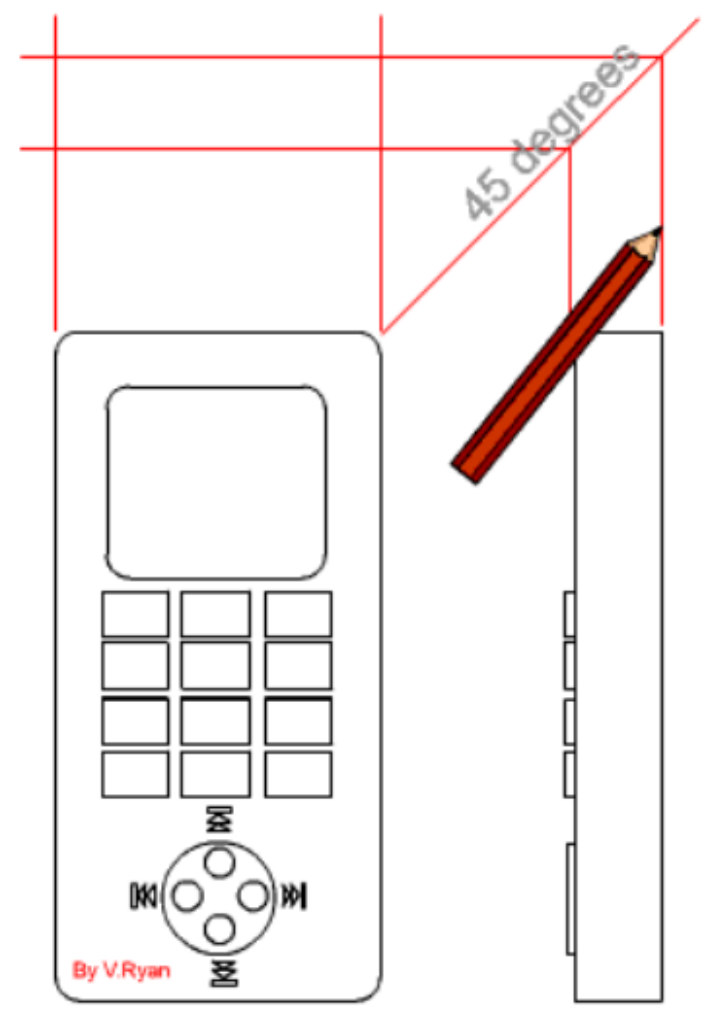

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7. Add the detail to the plan view (the keys). These can be seen from above as they stick out of the surface.

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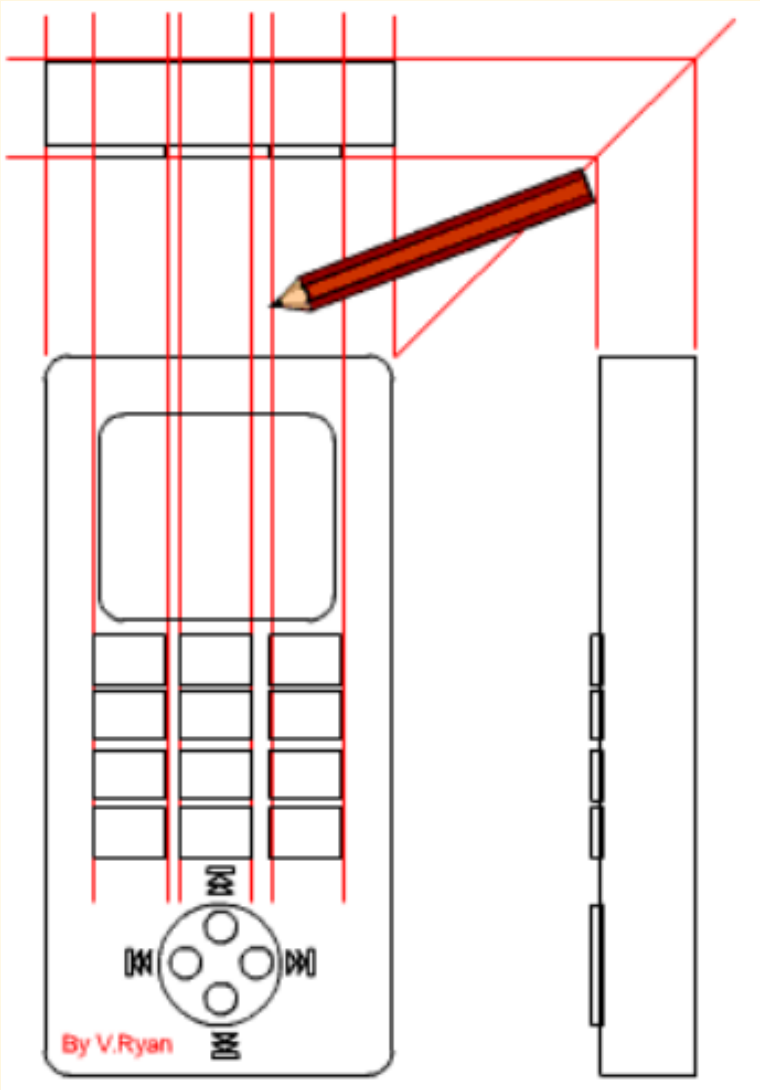

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Add dimensions (measurements). Study the way these have been drawn on the front, side and plan views.

Add the Third Angle Orthographic drawing symbol.

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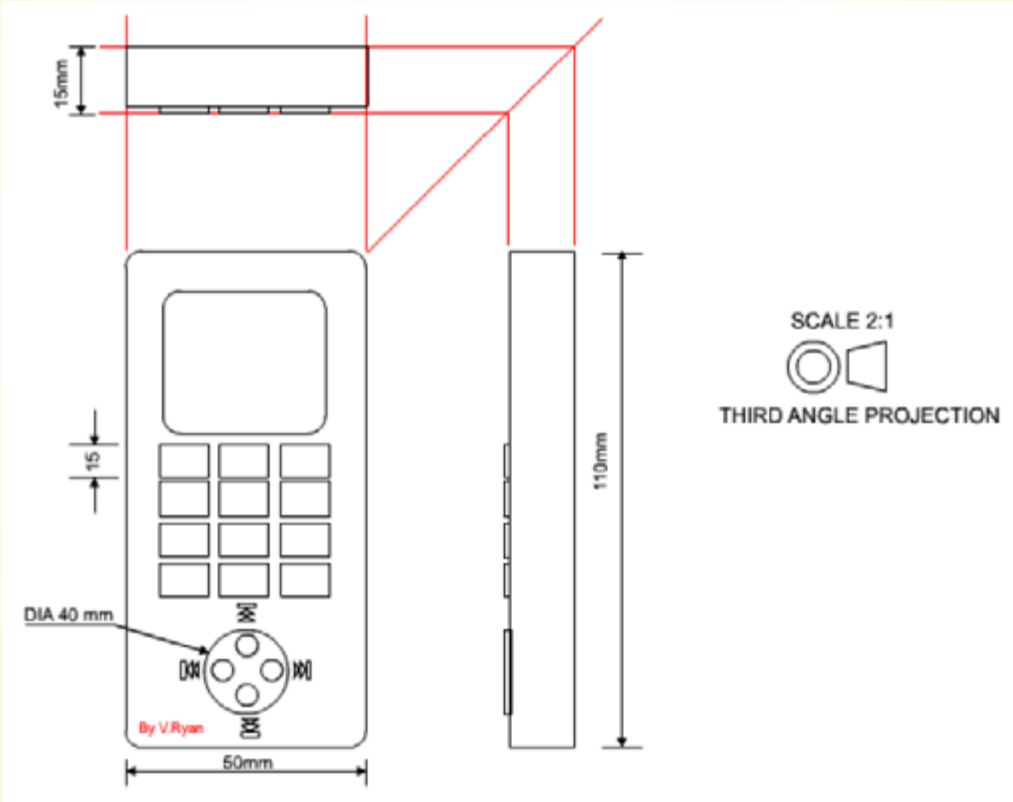

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FIRST ANGLE PROJECTION

First Angle project is NOT normally used. It was very popular up to the 1980s. The front, side and plan views are in different positions, compare to third angle projection. The international standard for orthographic drawing is now THIRD ANGLE PROECTION

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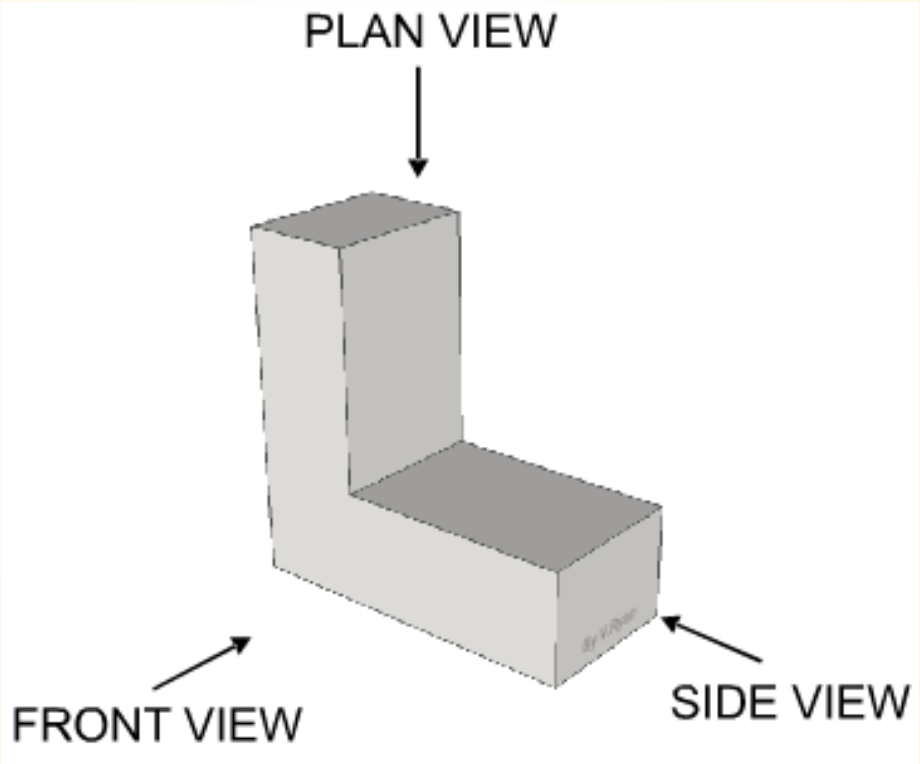

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FIRST ANGLE PROJECTION

The layout to the views are seen below. Note the different layout compared to Third Angle Projection.

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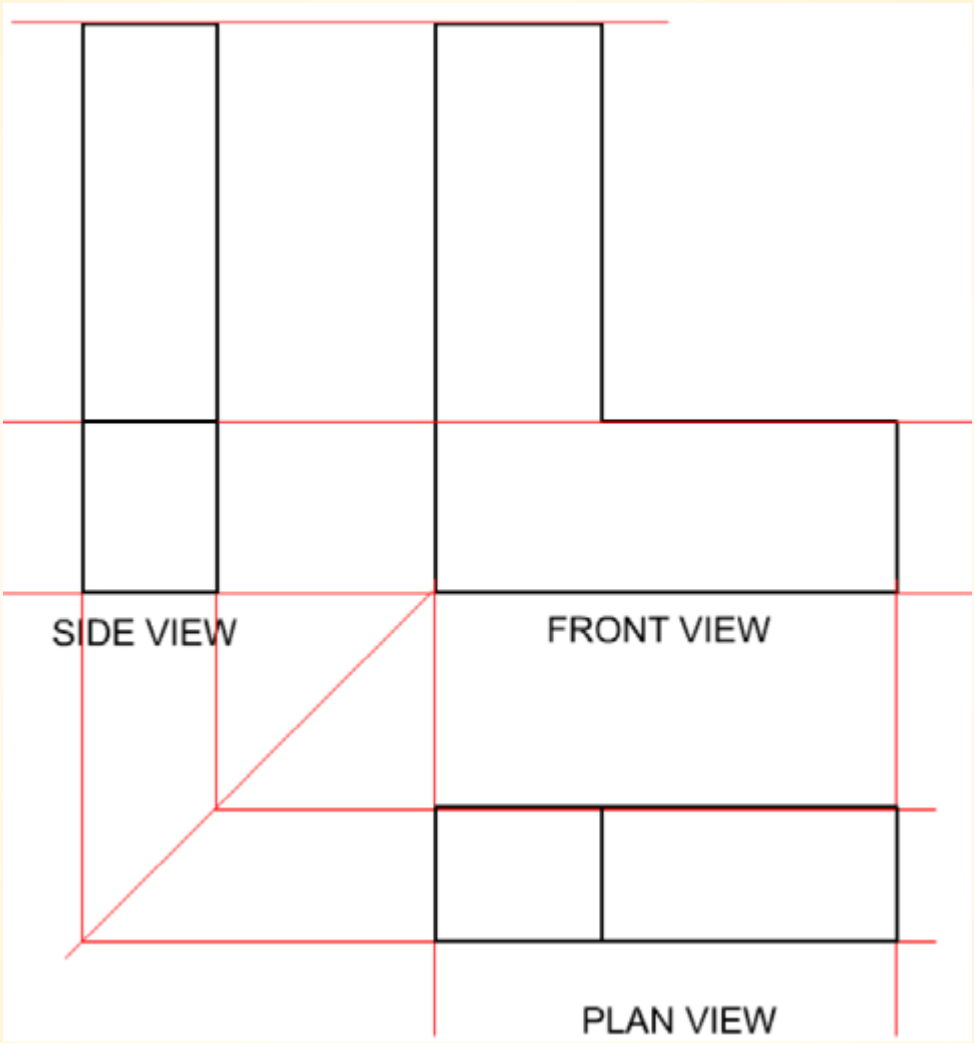

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FIRST ANGLE PROJECTION

The symbol representing First Angle Projection is seen below. This is applied to orthographic drawings that have the First Angle layout.

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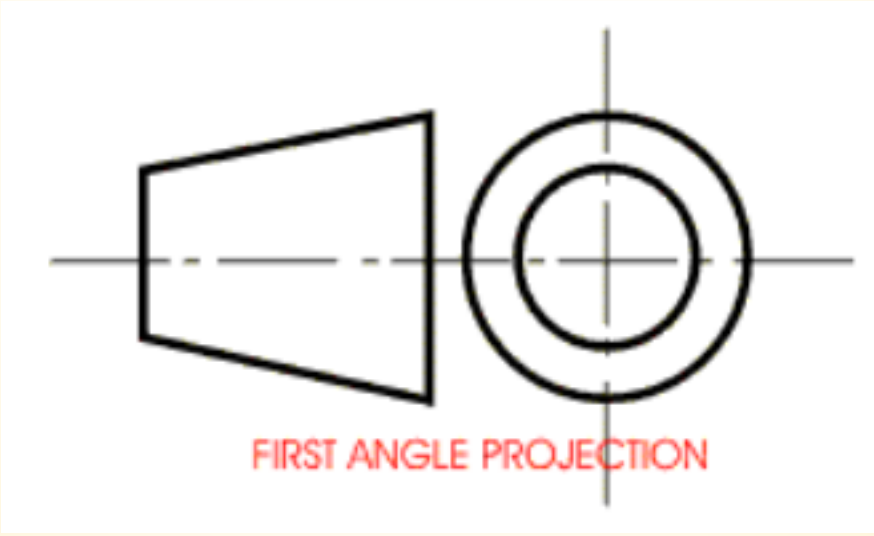

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