Indian Institute of Technology Kanpur
National Programme on Technology Enhanced Learning (NPTEL)
Course Title
Engineering Graphics

Lecture – 18
Missing Lines & Missing Views

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Missing lines and missing view.

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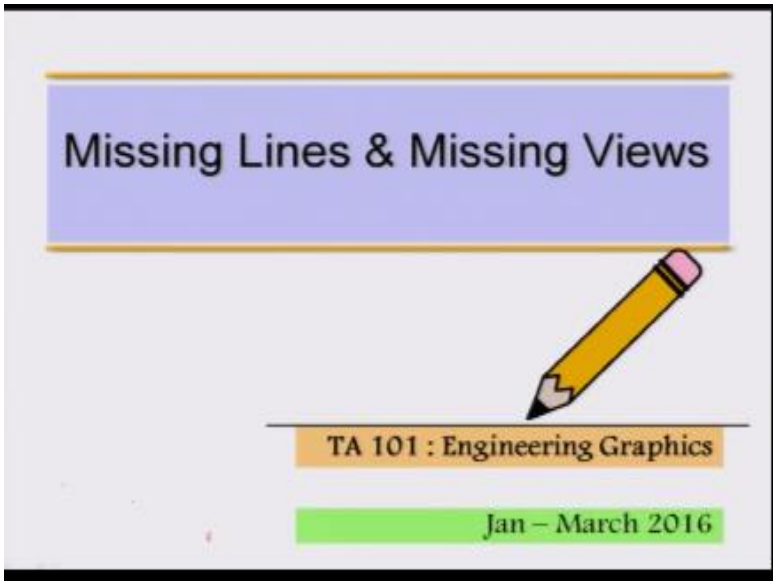

New chapter or new part in the drawings. So start with this missing line and missing view.

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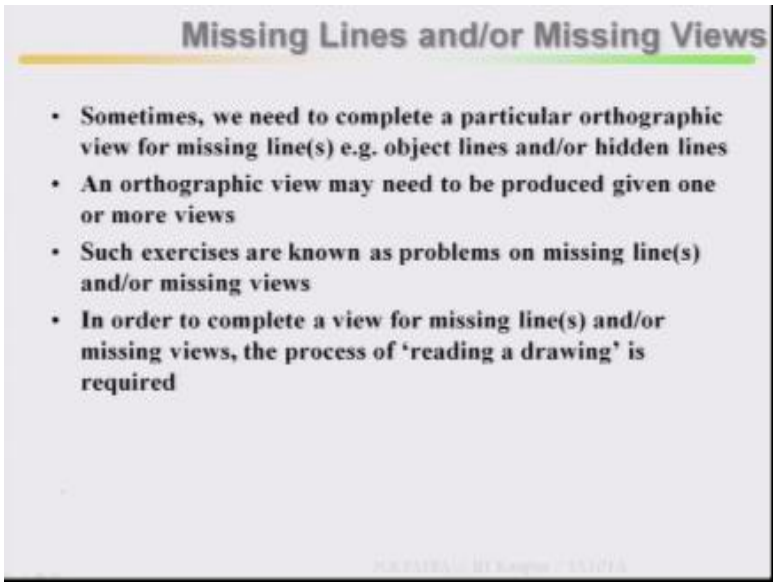

Sometimes we need to complete a particular orthographic view for missing lines, that means object lines or hidden lines. An orthographic view may need to be produced given one or more views. Such exercises are known as problems on missing lines or missing views. In order to complete a view for missing line or missing views, the process of reading a drawing is required, that means sometimes it may possible.

There are some part of the views are missing, maybe in the three orthographic views top, front, and side, some of the lines are also missing. So this has to be identified and corrected. So basically the process of reading of the drawing you have to read or you have to visualize by looking at this views and drawing can be completed.

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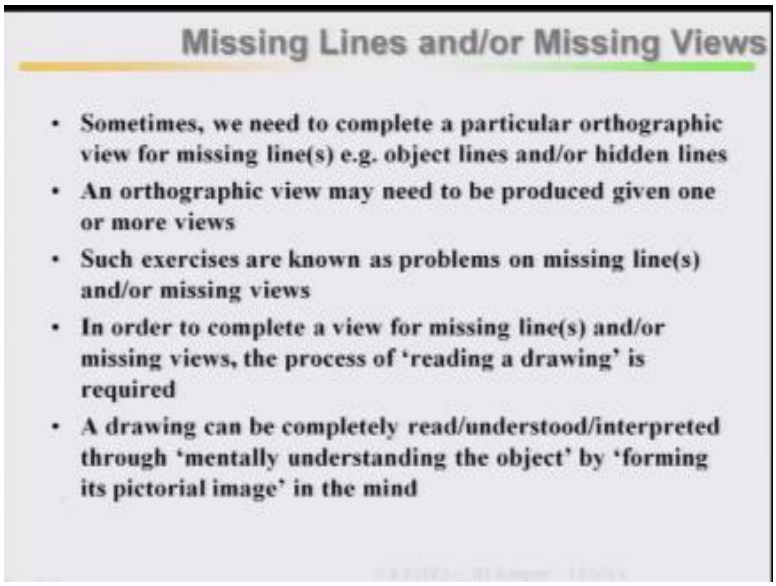

Or drawing can be completely read, understood, interpreted, through mentally understanding the object by forming its pictorial image in the mind but you understand, but that means the true picture of this object you have to prepare in your mind by looking at this whatever the views has been given to you.

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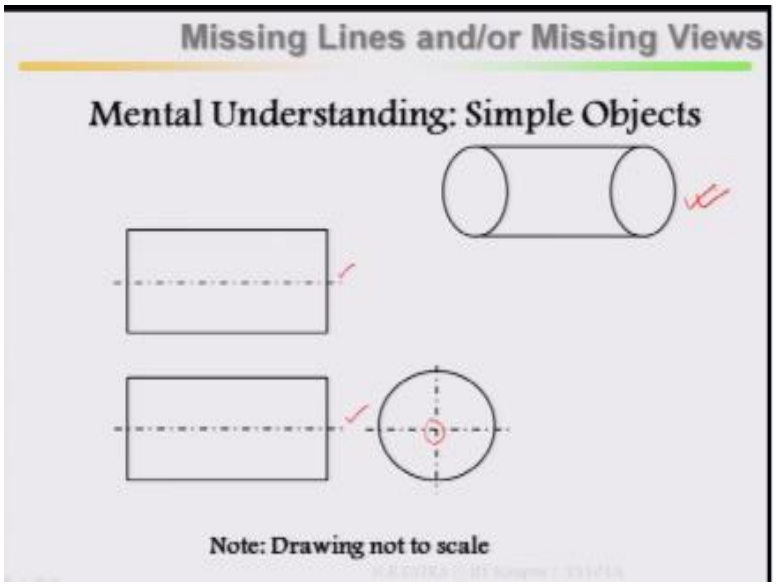

Now let us start with a simple example, what could be this object? This is your front view, this is your front view and this is your top view, side view is not given, simple object top view and front view. So what could be this object? You can tell is a very simple, now side view has been given, this is my side view. Look at this simple cube, this is your object if this object I am looking from this.

This is my front view looking at the top this the top view, looking at the side this will be the side view, this is what you are going to imagine particularly if there are certain miss, lines are missing in the views or maybe it may possible that one of the view may be completely missed whatever given to you, then you can imagine the pictorial view of the object. So first you have to imagine the pictorial view of the object.

After imagining the pictorial view then you can interpret what should be its top view, front view, and side view. Then from there you find it out which line is missing or which view is missing. Come to the second mutual understanding simple object, look at this object, this line if I read it this line what? This is the center line, this is the center line, then there is a hole in the side view, there is circular section.

In the side view with the center line here then how this object looks like? Cylinder, front view, top view, and side view. This is what you want to imagine, pictorial view has to be imagine mentally then only you can read it from pictorial view what should be its true front view, side view, as well as top view.

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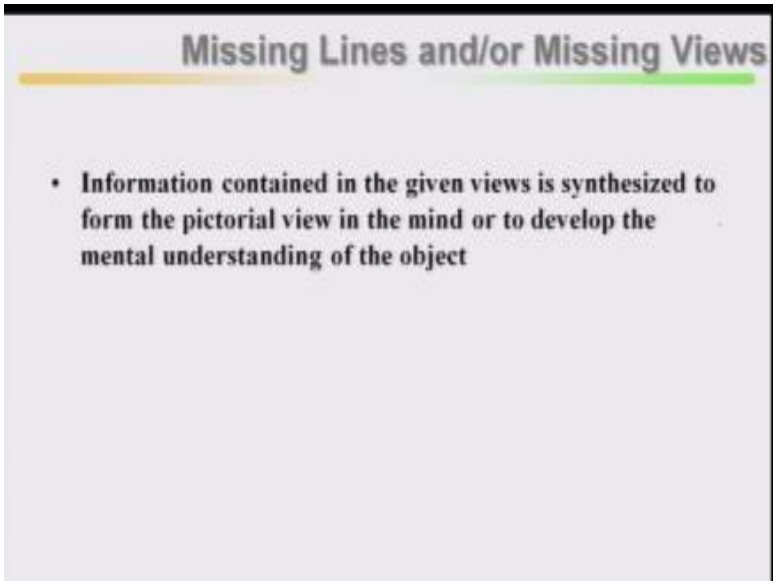

These are all simple examples, information contained in the given view is synthesized, whatever I have said now this information contained in the given view is synthesized to form the pictorial view, whatever the available information is given, even if there are certain miss lines are missing it has to be synthesized to form pictorial view in your mind.

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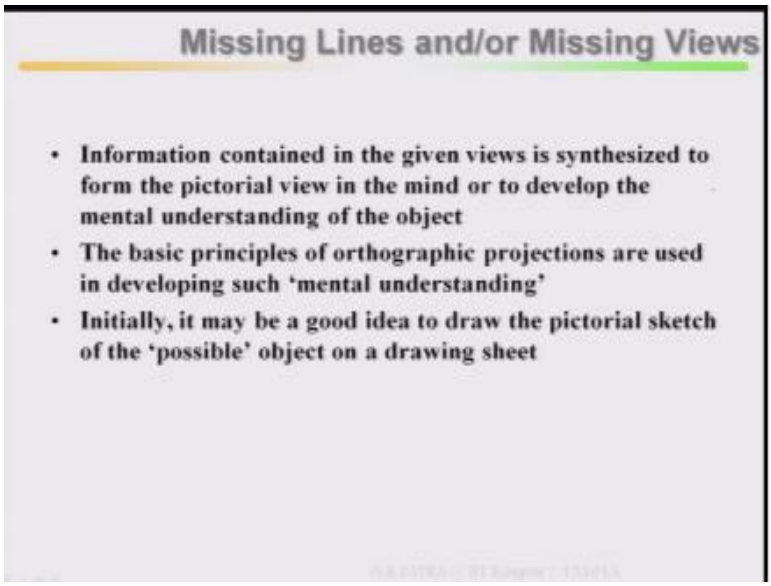

Or to develop mental understanding of the object, basically you have to develop mental understanding of the object. The basic principles of orthographic projections are used in developing such mental understanding, initially it may be a good idea to draw the pictorial sketch of the possible object on a drawing sheet, initially instead of imagination initially you take a drawing sheet and try to draw the pictorial sketch based on the views top, front, and side view has been given to you.

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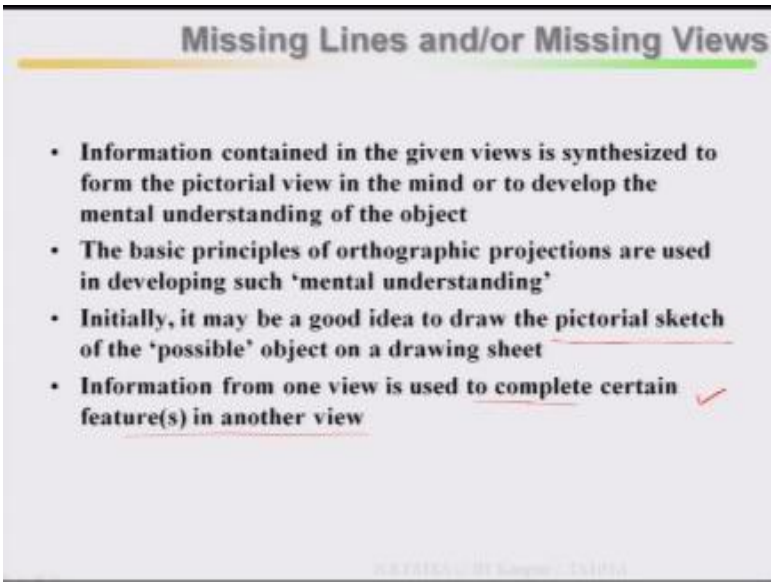

Draw the pictorial sketch, then information from one view is used to complete certain features in another view, this is primarily important, information from one view, if one viewing information is given you have to take the information from one view and collate with the other view, this is the basic principle means how do you start it? Basically initially you take whatever the views has been provided.

And draw the pictorial sketch on a simple drawing sheet and information of one complete view, whatever it is given try to collate with your other views so that you can get an idea how is your pictorial view.

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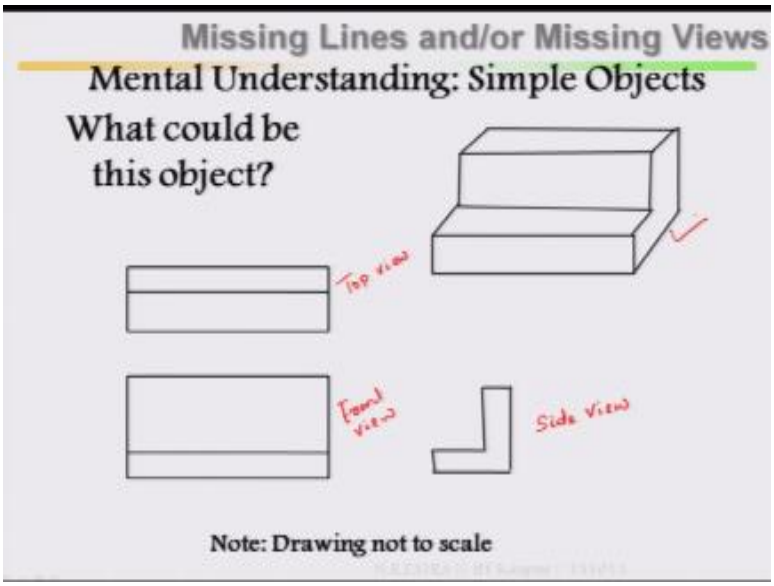

Mental understanding simple object what could be this object? Look at this, this is my top view, top view, this is your front view, this is your side view, can you imagine? Side view it looks like this, top view it looks like this, front view it looks like this, how it goes? I draw it pictorial view, let me see whether I can imagine or not, this is the way I am looking at the pictorial view look at this pictorial view.

After taking this pictorial view from the pictorial view, you draw the front view, top view, and side view, then you have your answer which line is missing or which view is missing.

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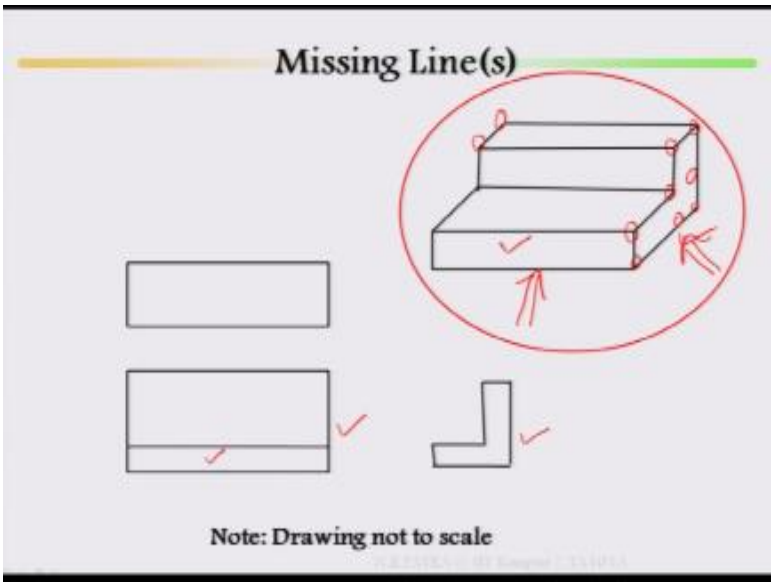

Look at here, if this is the case then what is your missing line? This is your pictorial view; this is your pictorial view what is your missing line? If this is your pictorial view, this is your pictorial view and this is your side, this is your front and this is your top view, then from this pictorial view draw the front view, that means if this is a pictorial view correctly you imagine then draw the front view.

That means you are looking at from this side, this is your front view if I am looking at here this line, this line, and this line, this point, this point, and this point it will merge, then what will happen this will look like, this will look like this, then once it is merged then again this point, this point, this point , this point are going to be merged because I am looking from here, my front view .

So there will be here it will be merge then this will be coming like this, then what about side view? If I am looking from right hand side if it is a third angle projections what is my side view look like?

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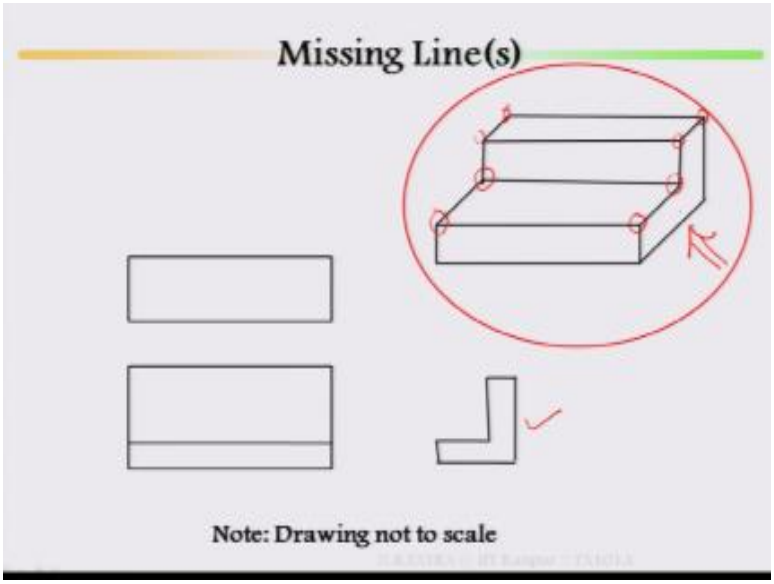

I am looking at right hand side view, this is the side view I am looking at here that means once you are looking at here this point, this point, this point, this point are completely merged that means only you can see it in this way then this, this, this, this are merged. So you are going to see this is your perfectly side view, that means in you can compare your front view RGT is here, that means there is no missing line in the front view.

As compared to your pictorial view, here in the side view there is no line is missing, now come to the top view.

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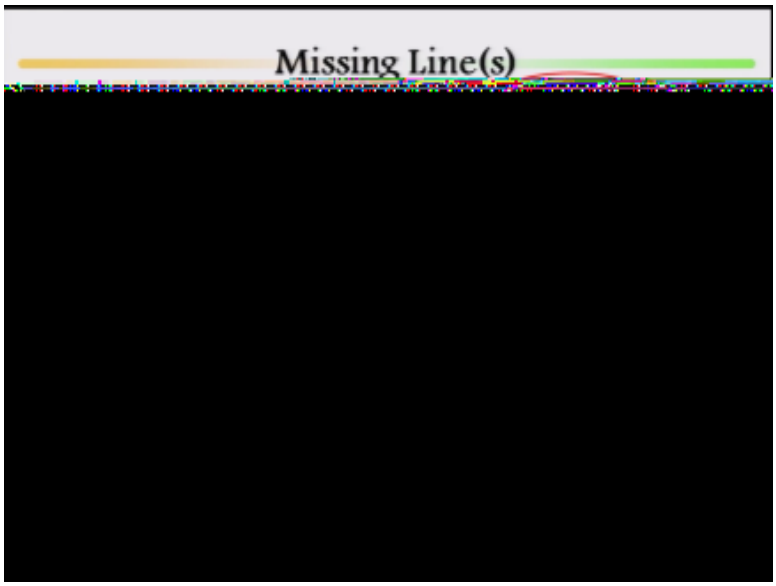

The moment you come to the top view I am looking this top view from here, this is my top view, if you are looking from here that means this point and this point, this point and this point these are merged, this is merged this is merged, once it is merged it looks like this then what happened? This point, this point they are going to merge. So in-between because there are two sections.

Here and here, in-between there is a line is missing, there is a complete line is missing that missing line you have to identify, this may be because of this is a old drawing, this may be because of some part while giving the drawing some part unintentionally has been missed. So you have to rectify it.

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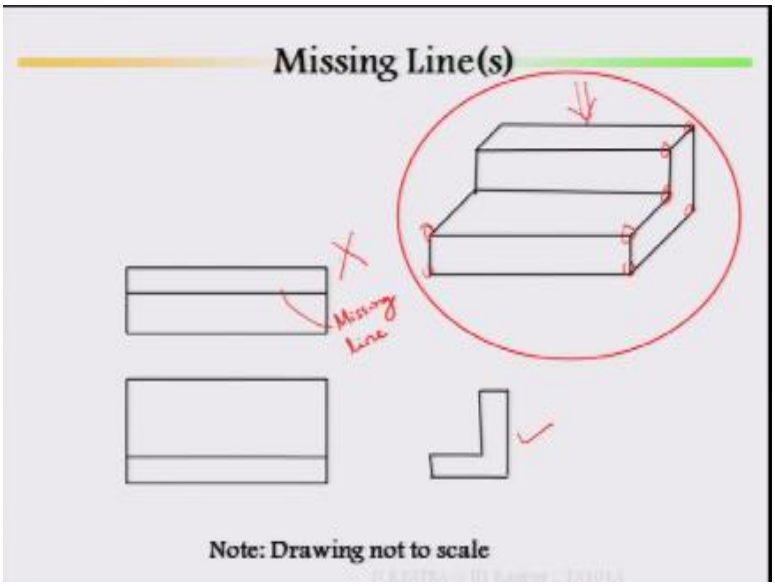

Now if I take it, see this is my missing line. So this missing line is on the top view. Now this two views are correct, this view is not correct, top view. So there is one line missing that is called your missing line in the top view.

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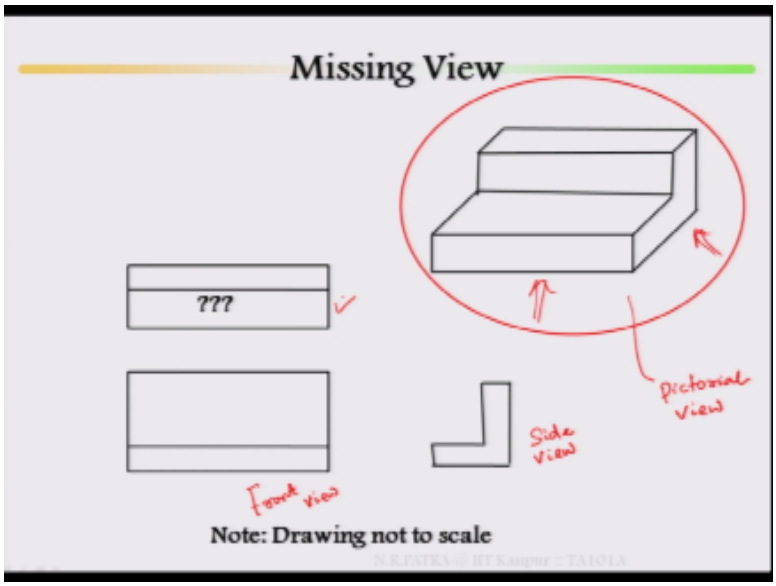

Then come to your missing view, this is one example of your missing line, then come to your missing view, look at here, suppose front view has been given, this is your front view, this is your side view, this two view have been given, now top view is missing you do not know what should be its top view. So from this two views you imagine your pictorial view, this is our pictorial view. Once you have drawn the pictorial view you cross check with your pictorial view whatever you have drawn.

Front view from pictorial view you look at from the front, check whether this front view is correct or not, then look at from the side, check whether the side view is correct or not then look at the top, then this missing view top view is completely missing, then you draw your top view. So top view is here, this is your top view it is your missing view. Now you understand missing line and missing view.

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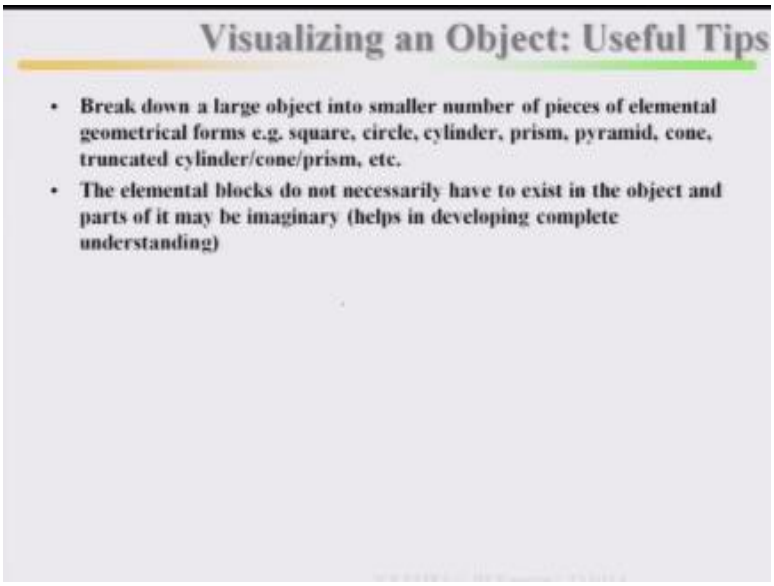

There are certain useful tips, there are no guidelines but these are the tips. Break down a large object into smaller number of pieces of elemental geometrical forms, breakdown a large object into smaller number of pieces of elemental geometrical forms, if there is a large object you break down into smaller number of pieces of elemental geometrical forms that means in terms of square, circle, cylinder, prism, pyramid, cone, truncated cylinder, truncated cone, truncated prism, all others.

The elemental blocks do not necessarily have to exist in the object and parts of it may be imaginary, it is not necessarily that you breakdown whole circle will be there or whole ellipse will be there, whole square will be there. Part of this square, part of the cylinder maybe there.

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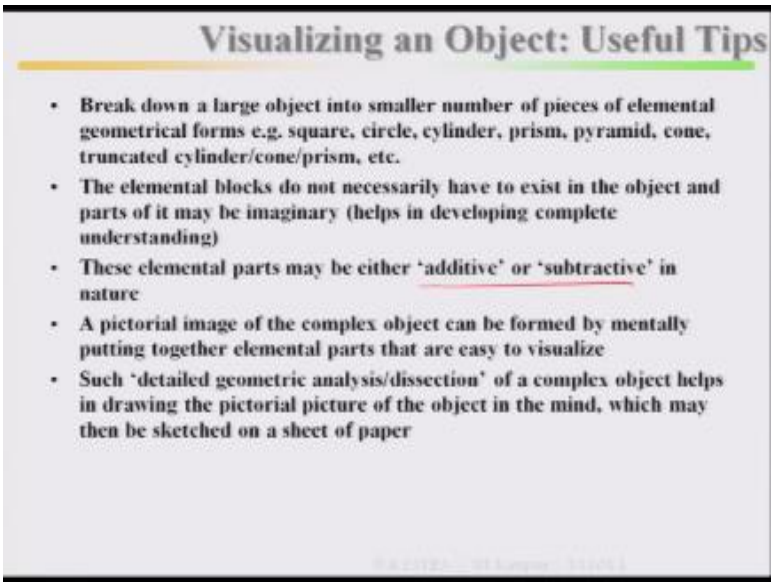

These elemental part may be either additive, just look at the third point, third useful tips these elemental parts maybe either additive it may be add by one with other or maybe subtractive, may be subtractive in nature. A pictorial image of the complex object can be formed by mentally putting together elemental parts that are easy to visualize, a pictorial image of the complex object can be formed by mentally putting together elemental parts.

That are easily or easy to visualize that are easy to visualize, if there are different objects you can collate all together so you can visualize what is your pictorial view. Such detail geometric analysis dissection of a complex object helps in drawing the pictorial picture of the object in the mind which may then be sketched on a sheet of paper, first you imagine then you take a sheet of drawing paper then you can sketch it, whether you are getting exactly this pictorial view of the object whatever you are imaging.

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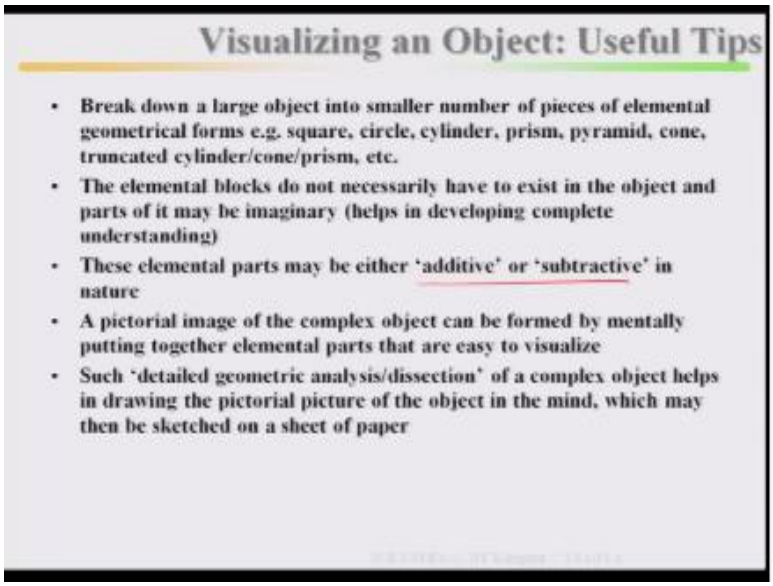

These are all tips, it will be very much useful as the problem will be slightly difficult.

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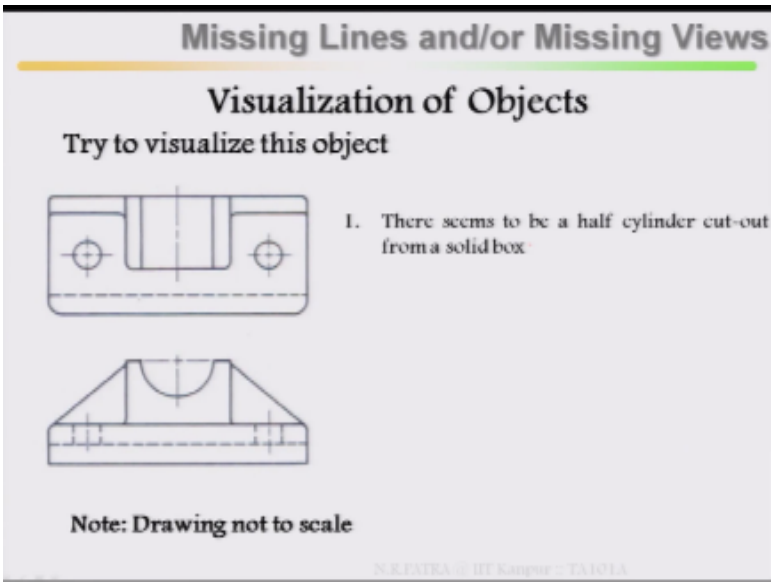

Look at this object, look at this is your object, how this object looks like? Now this object it may be thought of consisting of many smaller element part, this may be consists of small, small element part has been joined or assembled. Now if I take out one by one part, look at this, this is your complete object how it I make it imagine it or I make it into small elementary parts, what are the different elemental parts?

Most of the elemental parts if you look at here, this has been added with this, this has been added with this, this has been added with this, this has been added with this, this has been added with here and this again this has been added to this, which element part are subtractive; which is additive, which is subtractive? That you have to find it out, it may possible?

This part is solid; semi circle part has to be prepared. So this part has to be taken out, so that there is a hole, half of the hole here. So you have to identify which is additive, which is subtractive. Then visualization of objects, try to visualize this object, there seems to be half cylinder cut out from a solid box.

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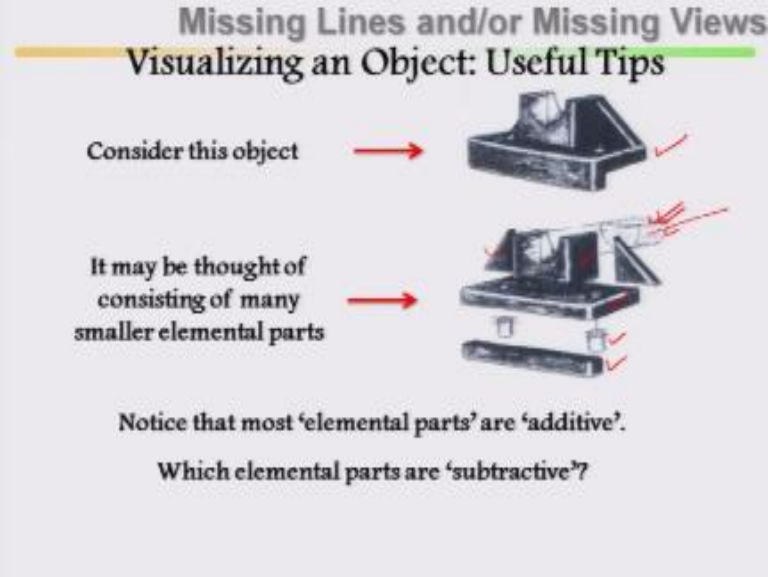

As I said earlier there seems to be half cylinder cut out from a solid box, this half cylinder has been taken down from the solid box.

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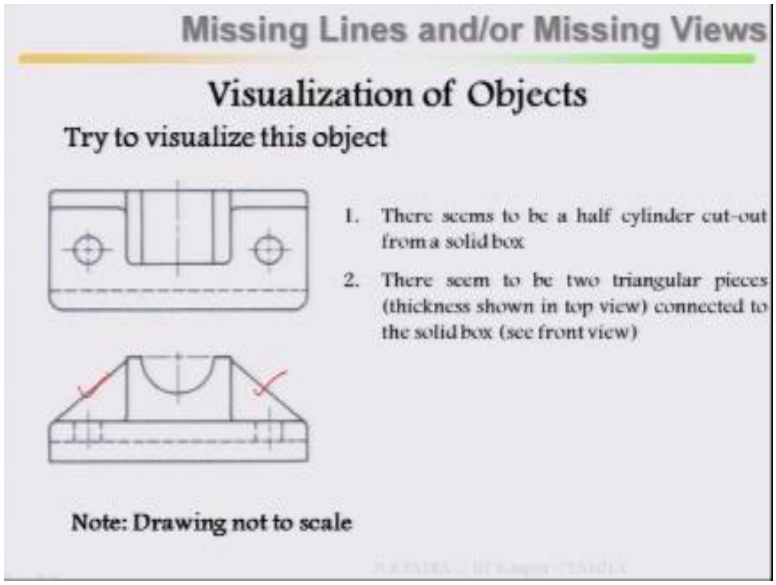

There seems to be two triangular pieces, thickness shown in the top view, two triangular pieces here and here connected to the solid box, look at this.

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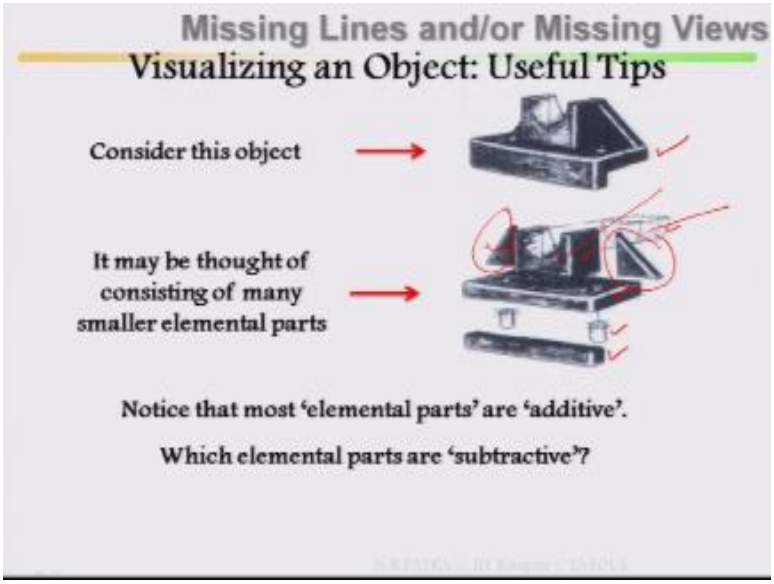

Here is your triangular box, two triangular box added to your solid box, this is your solid box it has been added this triangular has been added here, this triangular has been added here.

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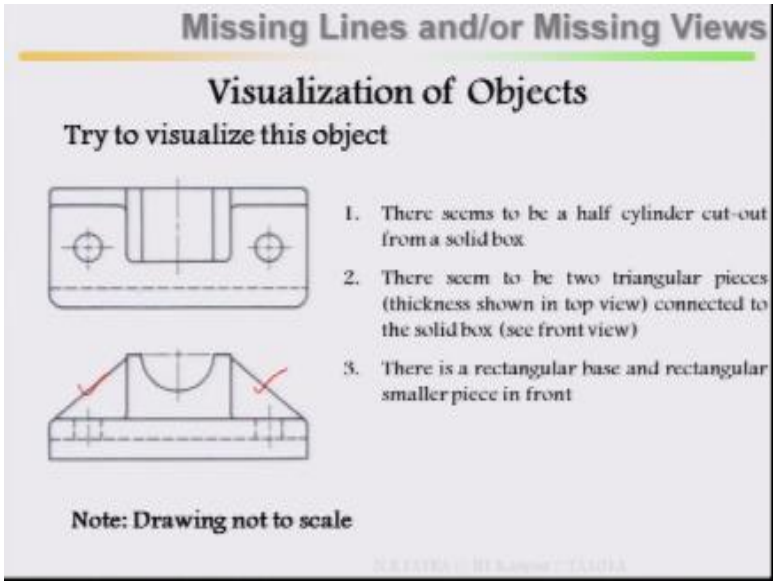

There is a rectangular base and rectangular smaller piece in front, rectangular box.

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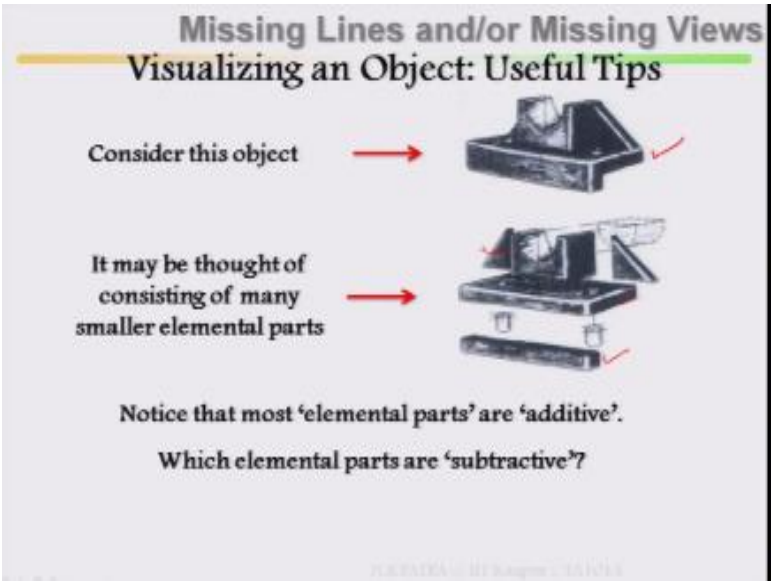

Let us look at the 3D view, this is a rectangular box, here there is a rectangular box, here there is a rectangular box, it has been connected by means of this holes by means of pins it has been connected.

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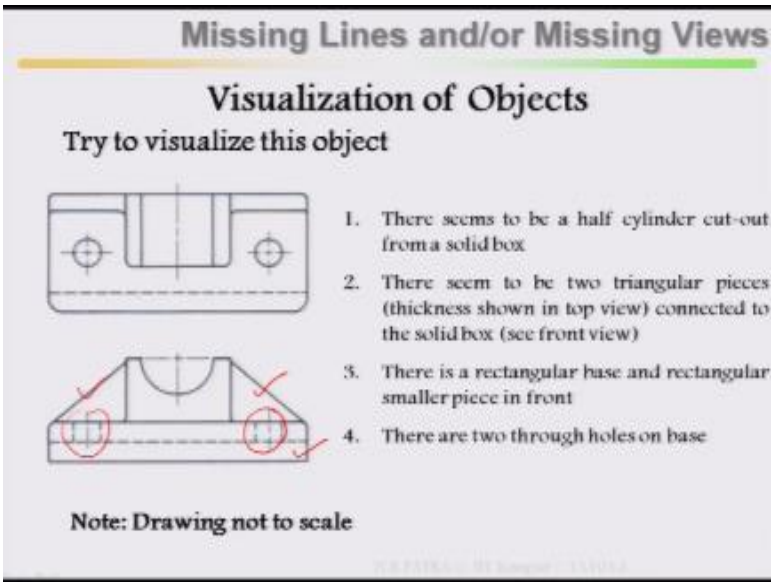

There are 2 thorough holes on the base, if you look at your base one hole is here, one hole is here, it is throughout. Now let us check.

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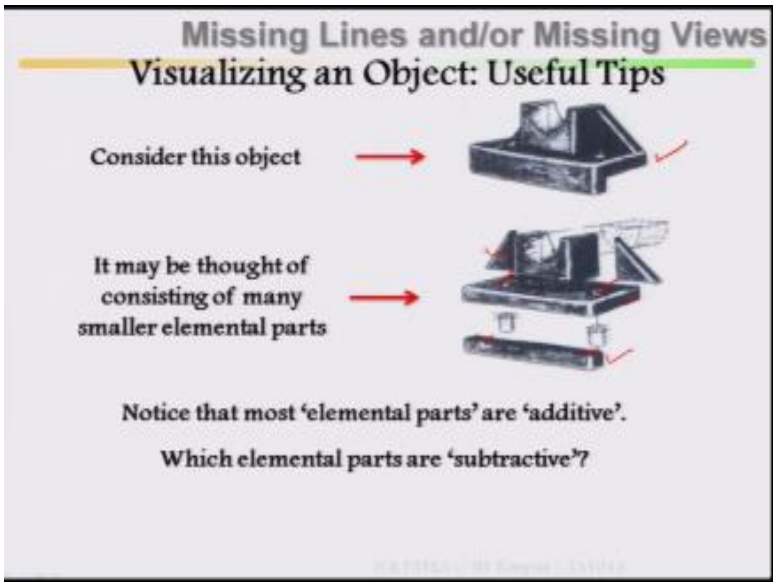

Yes there is a hole here, there is a hole here, there is a hole here, there is a whole here, this hole is throughout, it has been connected by means of pins or bolts.

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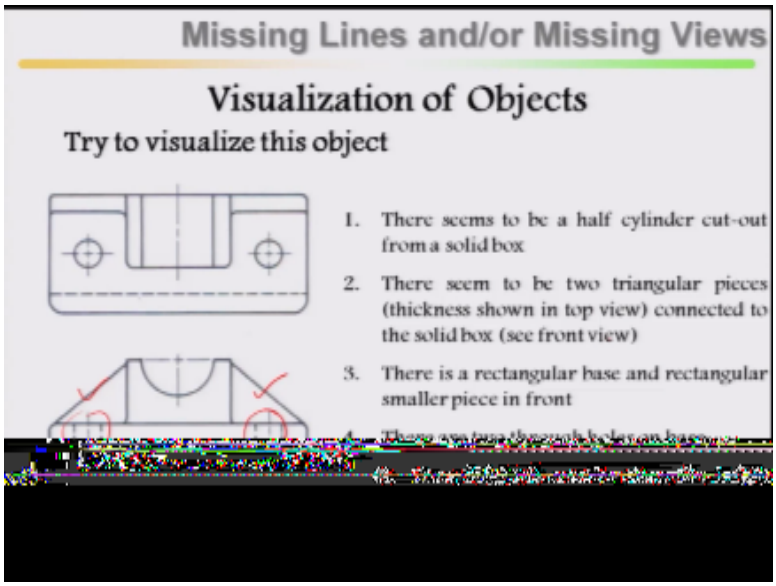

Base height is smaller than height of another rectangular piece in the front.

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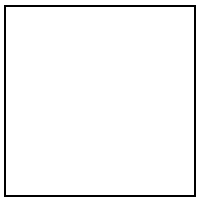

Look at this, base height is smaller than another rectangular piece in the front, this is your base height smaller than another rectangular piece in the front.

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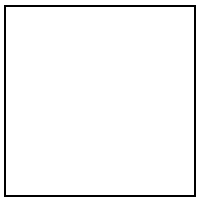

This is all about the discussion, how this same object small, small part additive part we put one by one, then subtractive part we put it and take it out like half cylinder cut out from a solid box, then it has been assembled, then you can imagine from there you can visualize your pictorial view, then once you visualize the pictorial view draw the pictorial view and once you draw the pictorial view from there.

You again redraw your front side as well as top view then look at whether any missing lines or missing views you need to have to have in your drawings.

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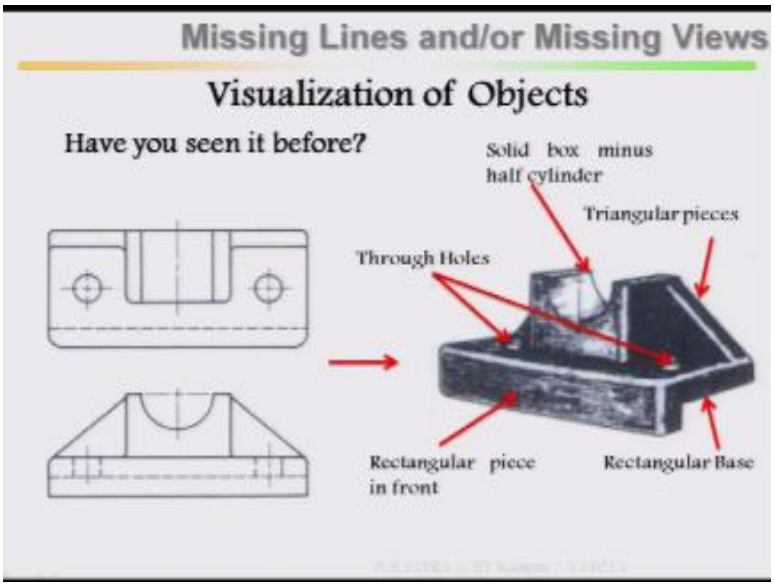

Look at here, have you seen it before? Solid box minus half cylinder, this is your solid box minus half cylinder, triangular pieces summarize, these are the triangular pieces whatever I have said it has been added with a solid box, rectangular base, rectangular base, rectangular piece in the front, this is a rectangular base and there is a rectangular piece has been connected, thorough holes or through holes. This is one hole, this is your second hole.

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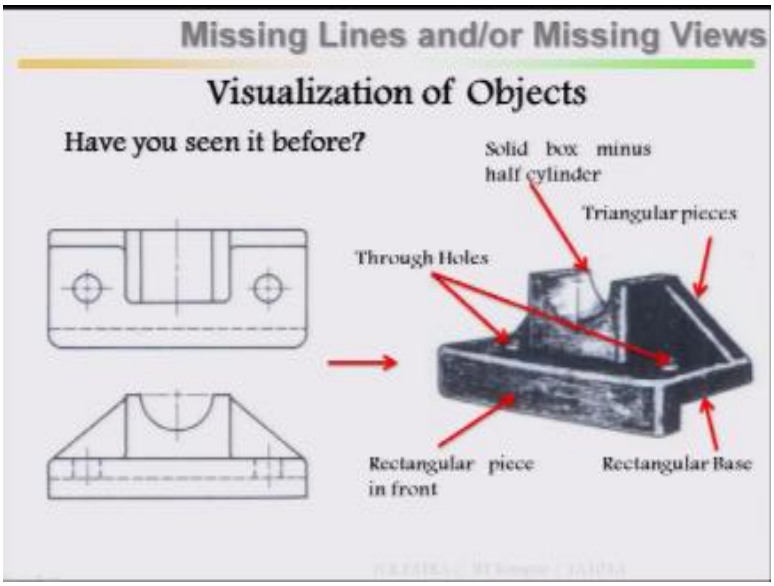

Once again just repeating it, have you seen it before, once again I am asking which part is additive which part is subtractive? You just imagine, solid box minus half cylinder, there is a solid box minus half cylinder, then triangular pieces added to your solid box both the sides, then there is a rectangular base, then another rectangular piece added to your in the front view, then there are two holes throughout in the front view and it is continuous.

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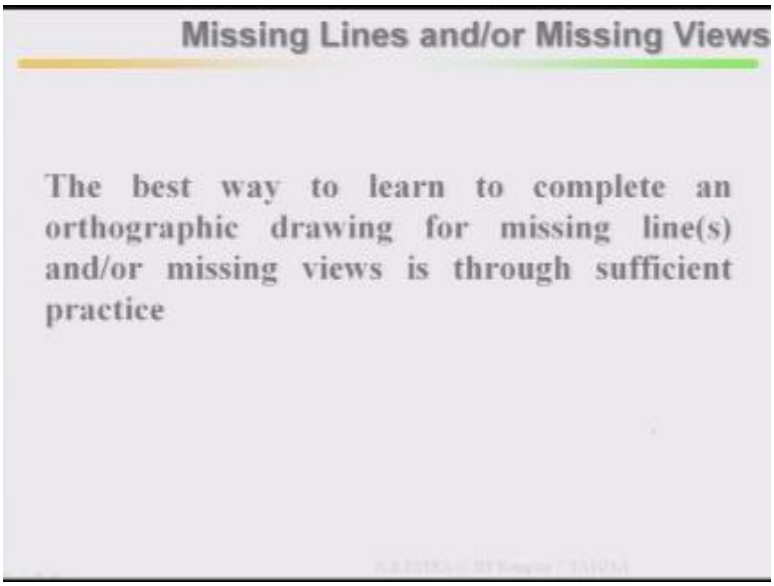

The best way to learn complete and orthographic drawing for missing lines and/or missing views is through sufficient practice, you have to practice again and again this problems, once you practice it your imagination will increase that means you can imagine how the object looks like, once it will be perfect then you from that your pictorial view you can plot it back your front, top, as well as side view. Then from there you can cross check whether there are missing lines or missing views need to be re-draw again.

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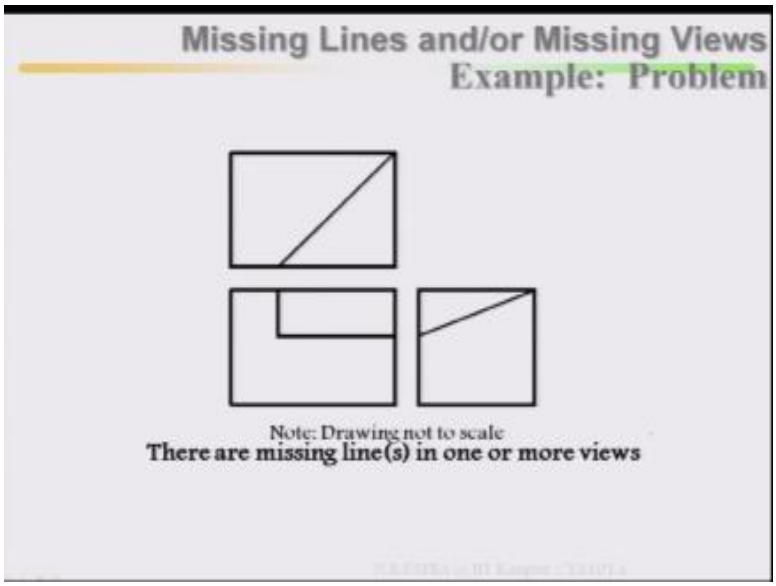

Let us start with example, very simple example let us start missing line and missing views example, this is your problem drawing not to the scale this is just up to the mark this case is there, there are missing lines in one or more views, remember missing lines means it does not mean that missing line only in one view, it may be possible that missing lines are in all views, missing line maybe in one view or missing line maybe in two view.

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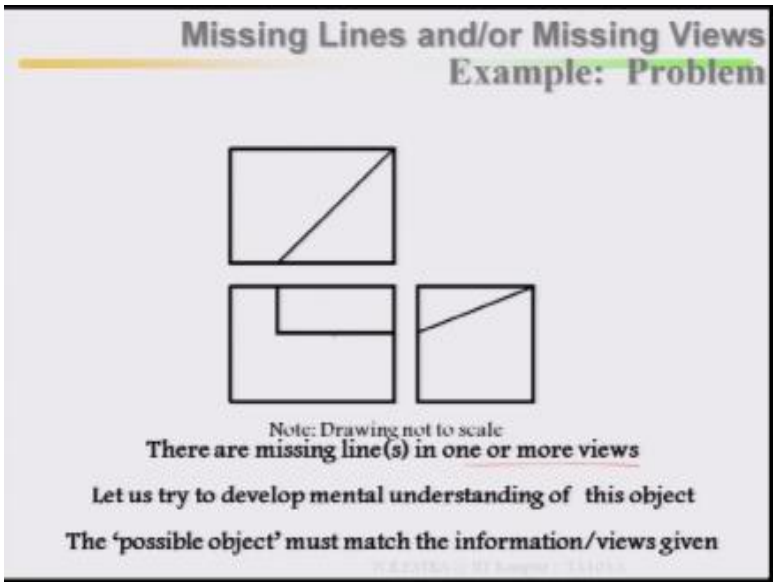

There are missing lines in one or more views either here, here or here we do not know, let us try to develop mental understanding of this subject, how I am drawing it imagining and the possible object must match the information view given.

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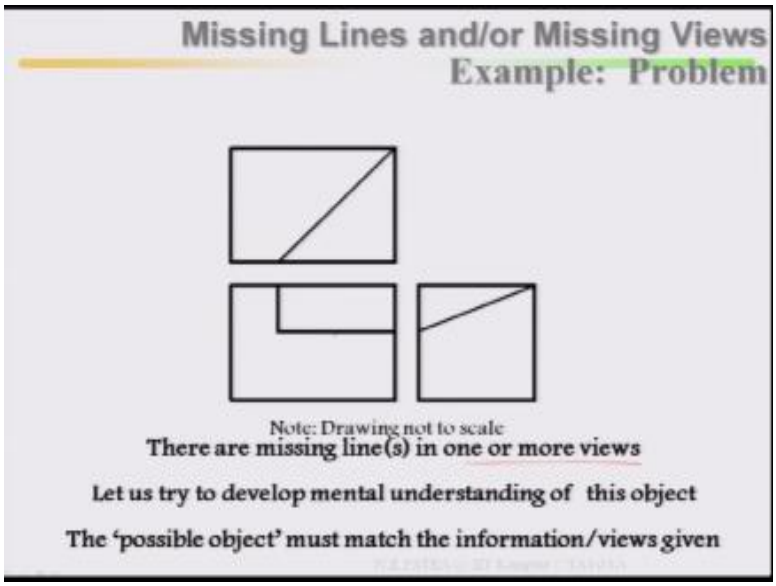

Whatever the possible object you are give or you have drawn that means your pictorial view, that should match the information given whatever the information.

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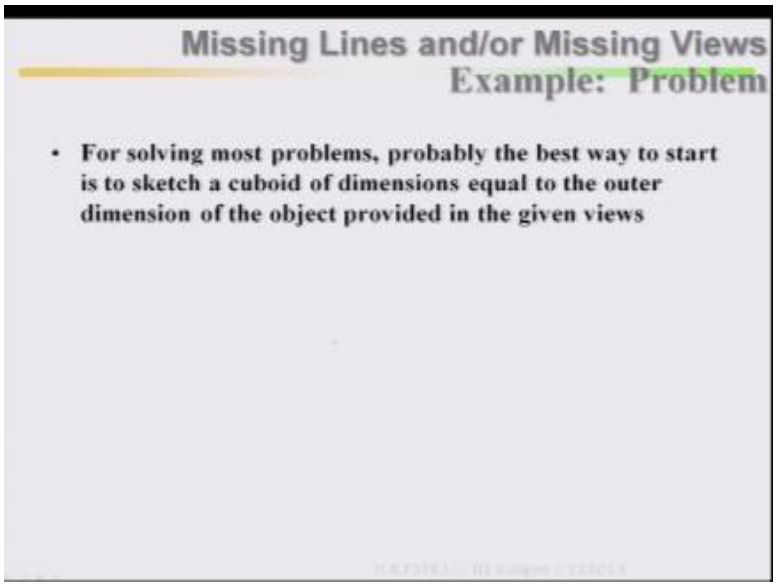

For solving most problems probably the best way to start is to sketch a cuboid of dimensions equal to outer dimension, first prepare a cube taking into consideration of your outer dimension of the object provided in the view.

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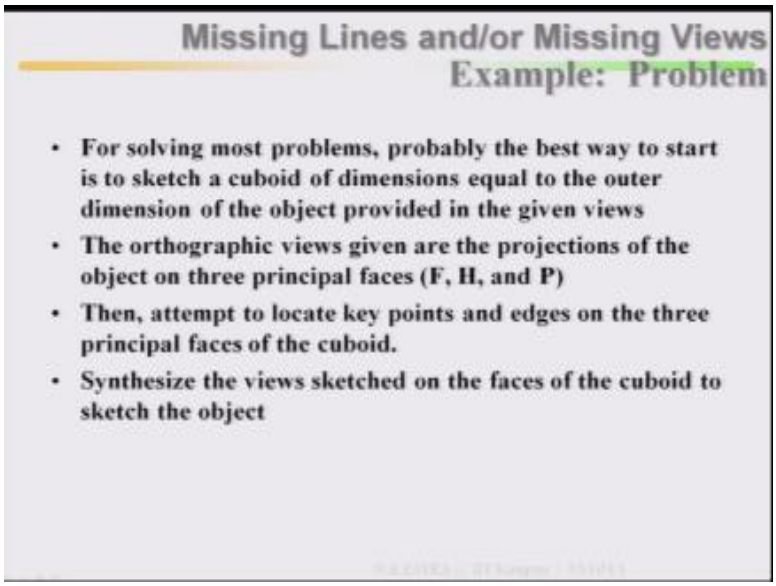

Then the orthography views given are the projections of the object on three principal faces, front, horizontal or top, P for profile or side, then attempt to locate key points and edges on the three principal faces of the cuboid, attempt to locate key points or edges, then synthesize the views sketched on the faces of the cuboid to sketch the object, then you synthesize all.

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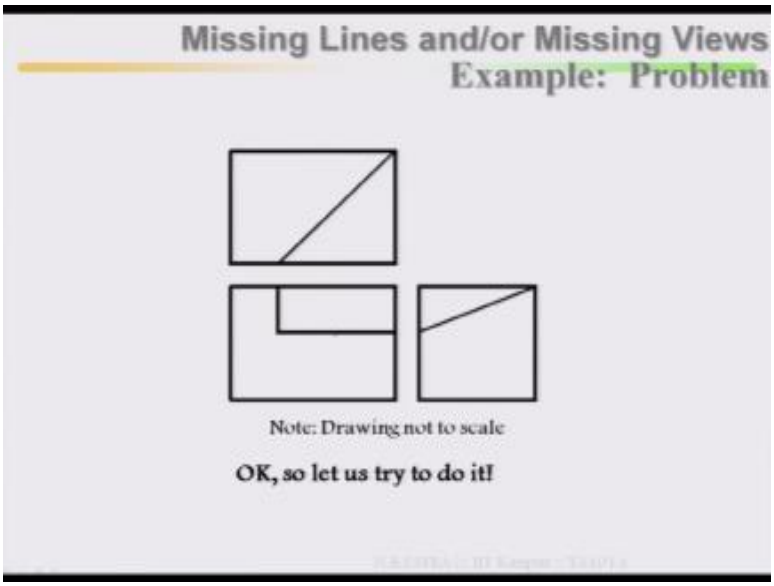

Now let us start with this example.

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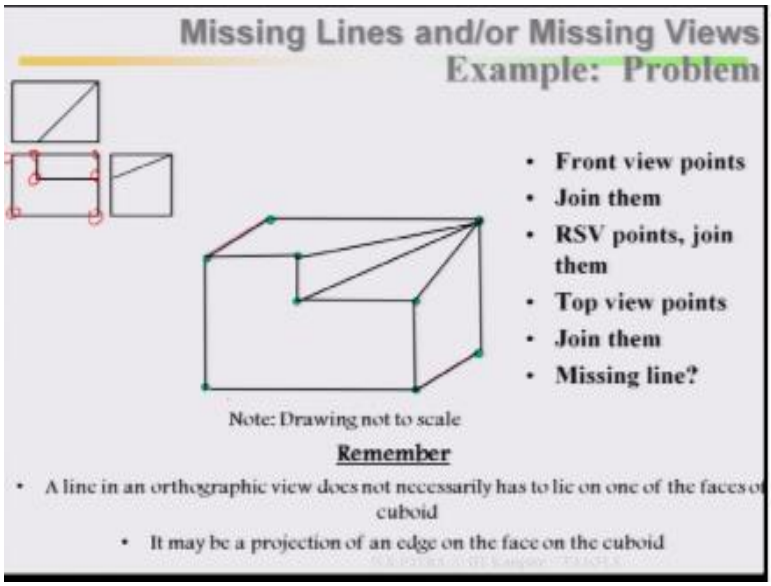

First consider the front view, take the front view points. So you are prepared taking into dimensions in the front view, top view, and side view entire cube has been prepared, then take the front view points. I have taken the front viewpoints this point, this point, this point, this point, this point, this point, this point, this point, it has been marked. Now join them one by one you join them.

It has been joined, then take right hand side viewpoints because right hand side viewpoints seems to looks like a simple one then join them. So I have taken the right hand side viewpoints then join it, the next part is top viewpoints take top viewpoints, I have taken the top viewpoints and joined them, joining it. After joining where is your missing line, where is your missing line? This is the missing line.

Look at here, take out all these things, how it looks? This is your missing line, a line in an orthographic view does not necessarily has to lie on one piece of the cuboid. So now if this is your missing line it maybe projection of an a's on the face of the cuboid.

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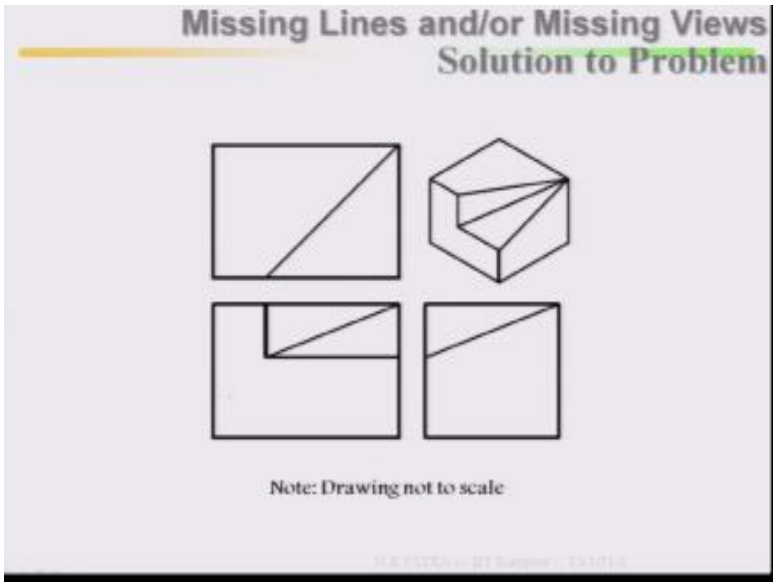

Now look at this missing line, where is your missing line?

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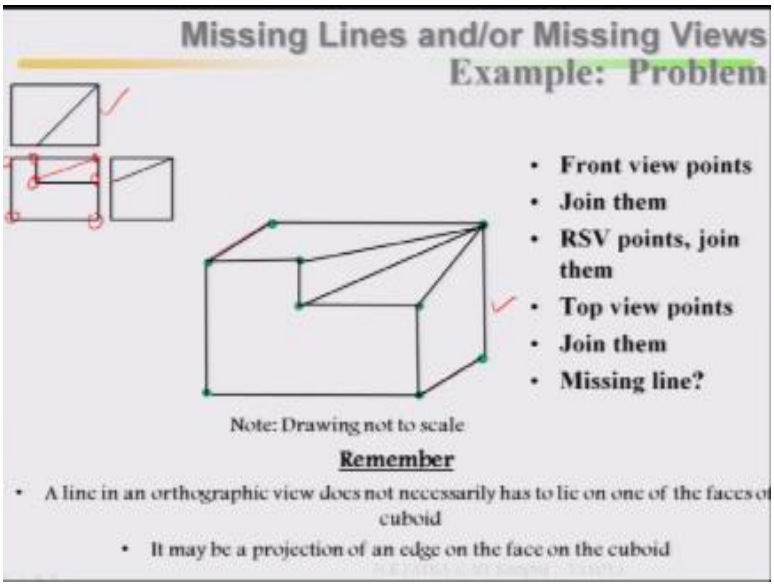

If this is your object, where is missing line looks like, in the top view what will happen? This point and this point will merge. So completely the top view is correct and the front view what is missing? This to this is missing.

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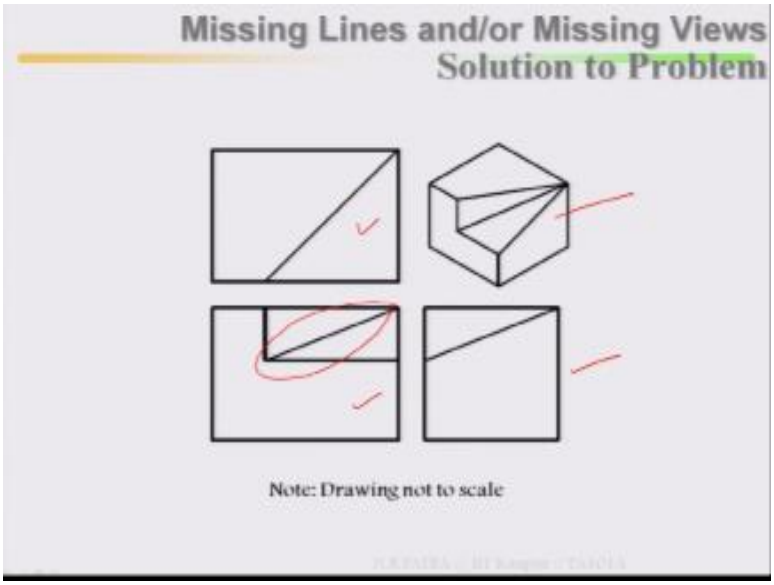

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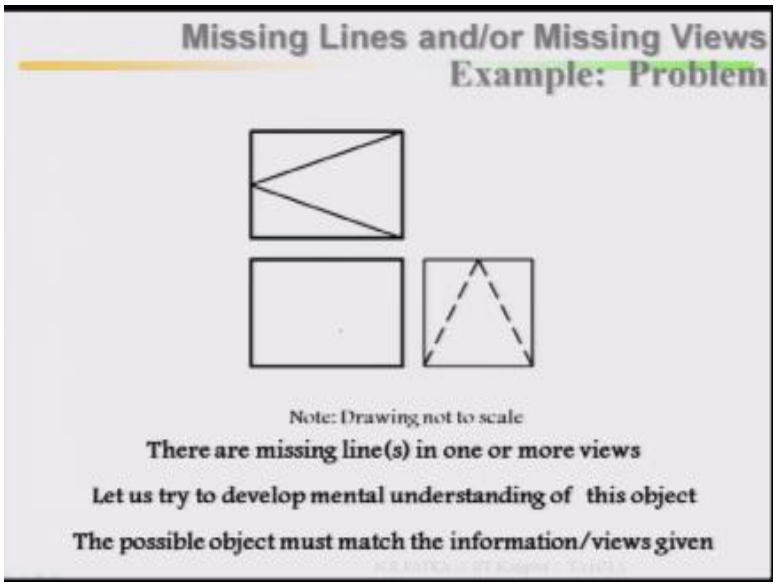

Look at here, this is your pictorial view, this is the side view, this is the front view, this is the top view, this line was missing in the front view. Now come to this second example, look at this second example, top view, front view, side view has been given not up to the scale there are missing lines one or more views, I do not know let us try.

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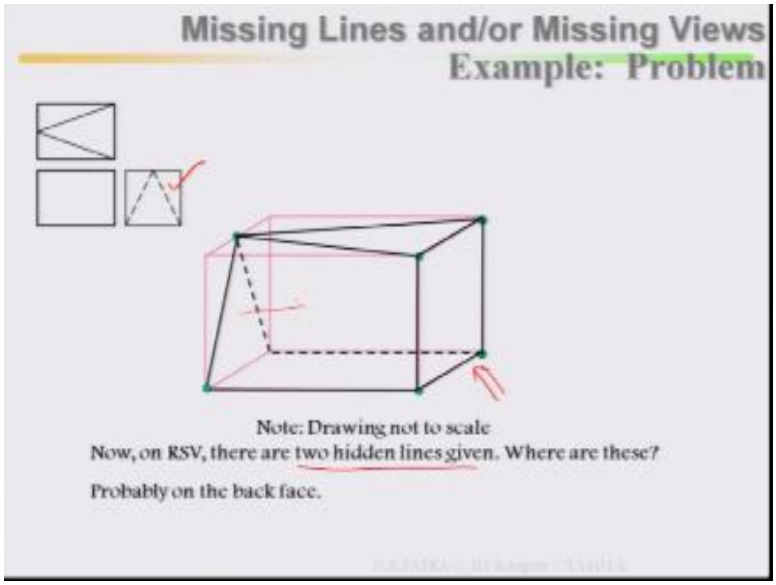

First considering this dimension you finish the cube, the cube has been finished, then take your front view front viewpoints, join the front view, take the side view side viewpoints join the side view, take the top viewpoints join the top view. Now on RSB right hand side view there are two hidden lines given, if you look at your right hand side view there are two hidden lines given where are these?

Because if I look at these right hand side view two hidden lines are there, probably on the back face what develop in your mind because I am looking the right hand side from here, that means two hidden lines because I am looking it here it is not supposed to be here probably at the backside here somewhere else here, then let us draw it, let us draw it, let us see.

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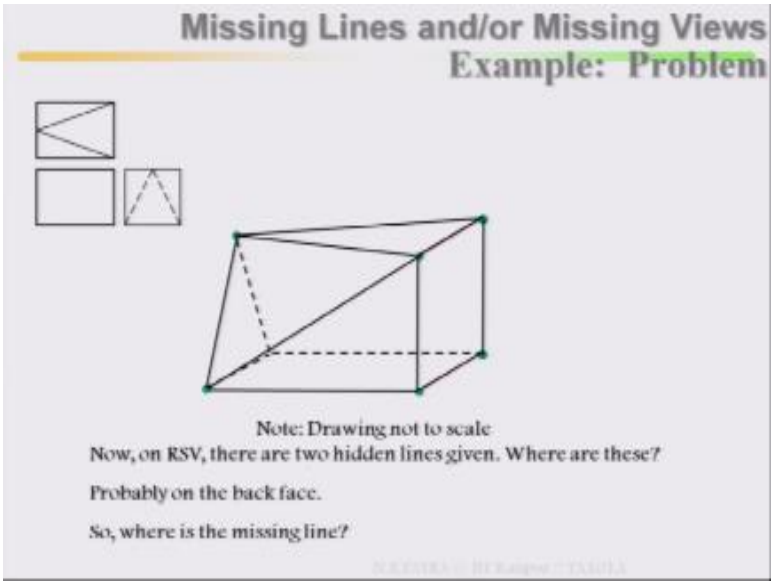

Take out, take out, is it correct? Ask yourself whether it is correct yes, pictorial view is correct, the pictorial view is correct, where is your missing line, where is your missing line? Look at here.

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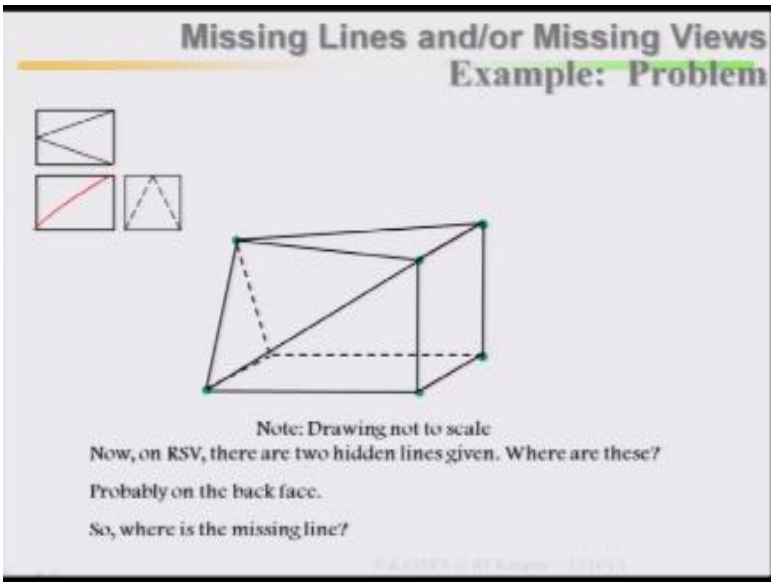

Pictorial view is not correct, again you have to finish the pictorial view, then once you finish your pictorial view then where is your missing line? Missing line will be if am taking at this missing line will be in the front view, this is your missing line.

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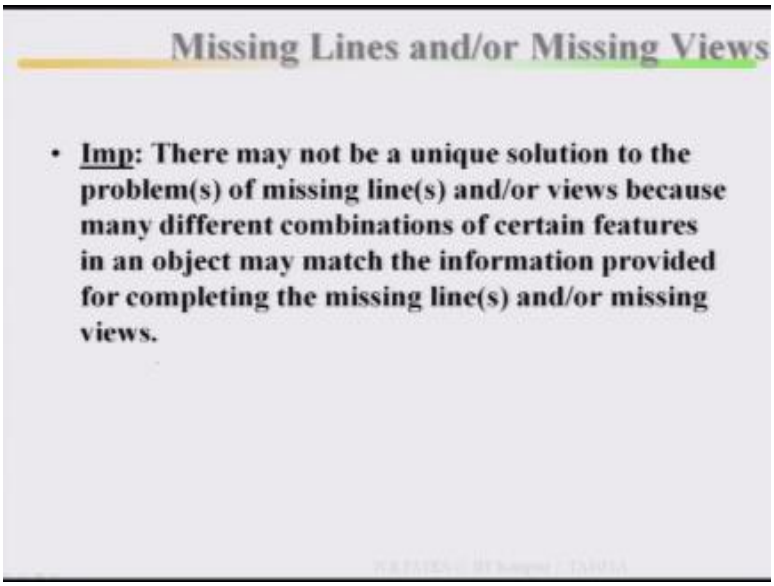

Remember there may not be a unique solution to the problems of missing lines and missing views, there is another part confusion is there, there may not be unique solution, one 3D object or pictorial view it may not be a unique solution may be different pictorial view may come into picture.

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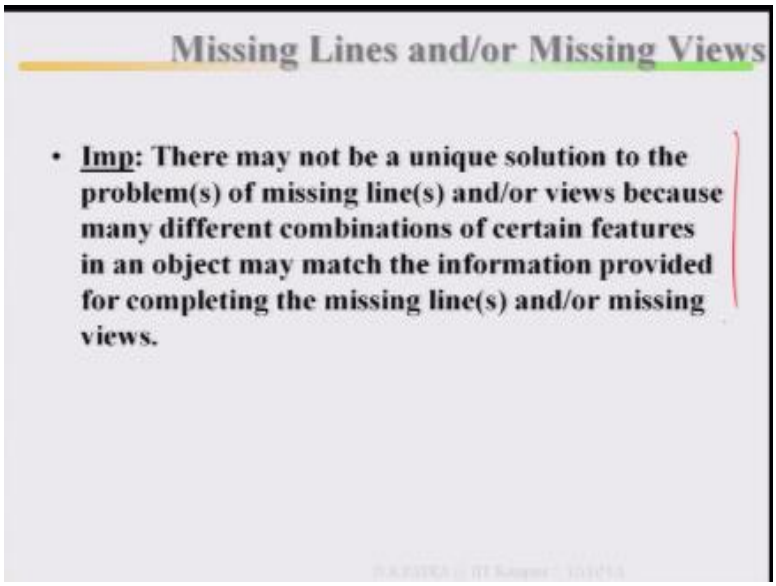

Because of many different combination of certain features in an object may mass the information provided for completing the missing lines or missing views, this is the bottom line, these are all guidelines I have shown you, this is the solution, maybe different solution maybe come into picture. So this missing lines and missing views are required if there is something missing in your final drawing the drawing can be completed so that complete object can be visualized with your previews, thank you. So next class I will start perspective views.

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