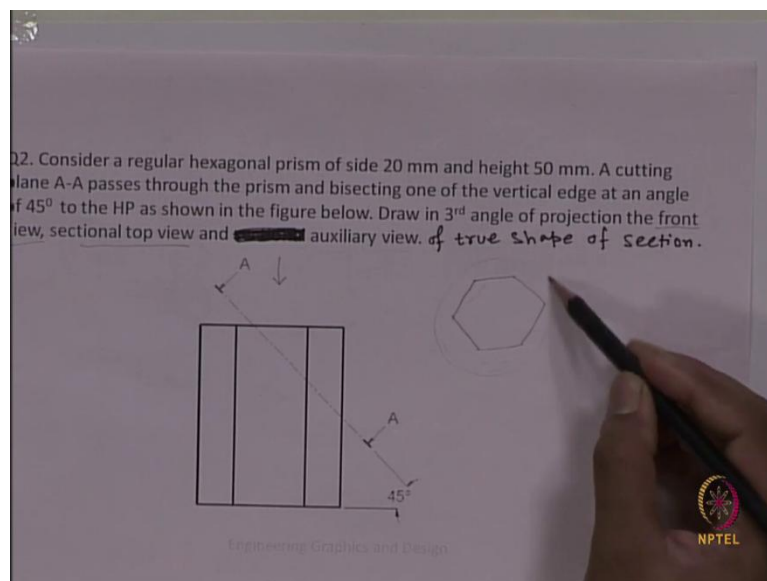


Engineering Graphics and Design
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Lecture 26
Week 5: Auxiliary and Section views
Example: Auxiliary View

Now, we are with problem number 2, where the auxiliary view we will be drawing. In problem number 1, we have seen the sectional view, how to draw the sectional view of an object. In case of problem number 2, we will be looking at how to draw the auxiliary view.

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This is the problem number 2. If you read the problem, they consider a regular hexagonal prism, where the cross section of will be a regular hexagon. The side length is 20 millimeter, the height is 50 millimeter and a cutting plane A-A passes through the prism. And this cutting plane is cutting the prism at an angle of 45° .

And you already know from the lecture like when there will be this kind of inclined surface, the surface which is not parallel to any of the primary planes, so it will be a kind of inclined plane for those kind of objects or those kind of planes or features we need auxiliary view. If we want to capture their true shape or true view, we have to go for auxiliary view. So, that you already know from the class.

As in this question also there is a plane like this. So, after cutting the hexagon through this plane, we will get an inclined surface to understand the actual feature of the inclined surface or the actual length and actual section, so we have to go for the auxiliary view. For the

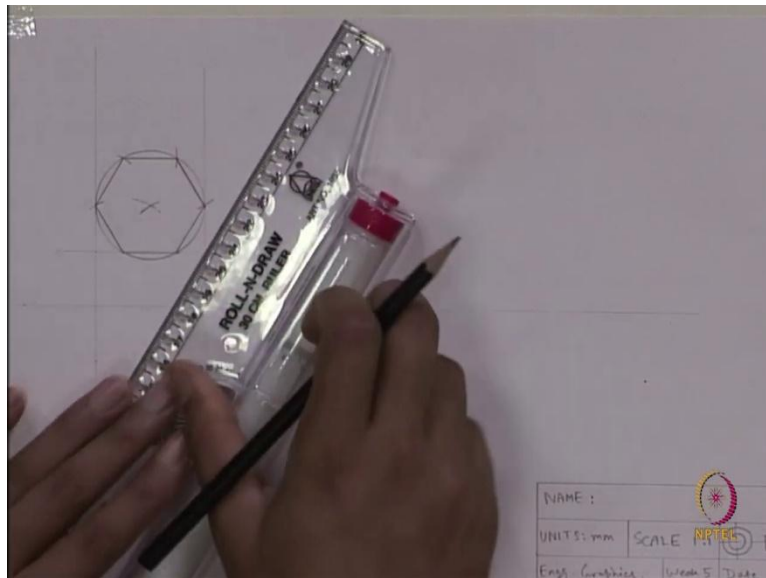
auxiliary view, we need the help of two different views, one is the adjacent view another is the related view.

What is the adjacent view, and what is the relative view? All those things have been covered in the class, but in this particular drawing, I want to mention that our sectional top view will be the relative view, and the front view will be the adjacent view. The rest of the things I will explain once I start the drawing.

So, we have to draw in third angle of projection we have already prepared our sheet using the third angle projection sign and the name, unit is in millimeter. And if you just look at this already it has been given what is given here, the front view of a regular hexagonal prism. If you look from the top, so what you will look at? You will look at a regular hexagon.

If you look from the top, you will look the top view of regular hexagonal prism like this, but there is a cutting plane, so we have to be a bit careful while drawing it. First let us draw the hexagon, from the hexagon, we will come to the front view.

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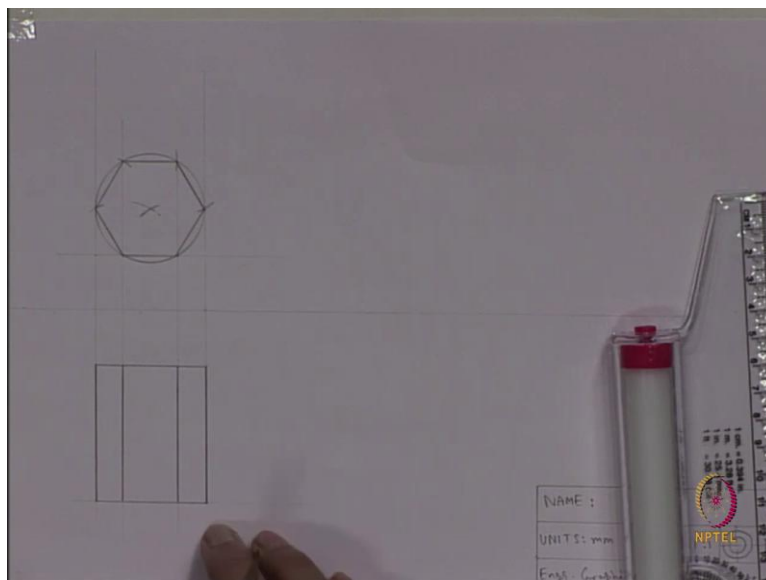
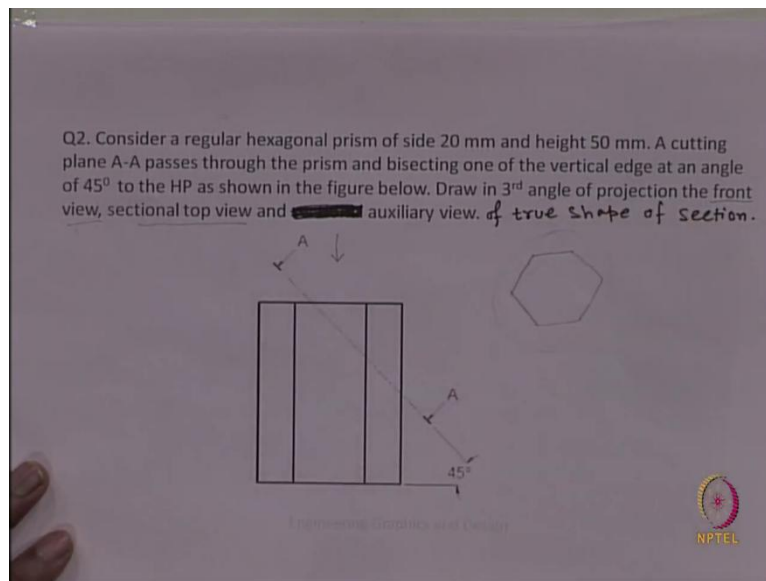


This is the third angle projection, so the top view will be in the top. The side of the hexagon is 20. And how do you draw a hexagon using hand? So, what you know is to use the compass for a hexagon. In this compass first we have to select the length is 20, and then, we have to draw an arc this side, similarly, from this side also you have to draw an arc. Now, from this arc, we have to draw a circle from the intersection points of the arc we have drawn a circle. The next process is very simple, already explained in the class, but still I am doing here. The

same length covered the 20 is the side length of the hexagon. So, we have taken 20 here and using the compass we will be drawing arcs.

So, we have got all the points for drawing hexagon. So, after drawing the hexagon actually, if you want you can remove the circle because circle we have drawn just for the help, so that we can get the point exactly on the position. But for this drawing I will keep everything whatever I have used for the construction of the hexagon, I will keep everything on paper so that you can understand how I have drawn.

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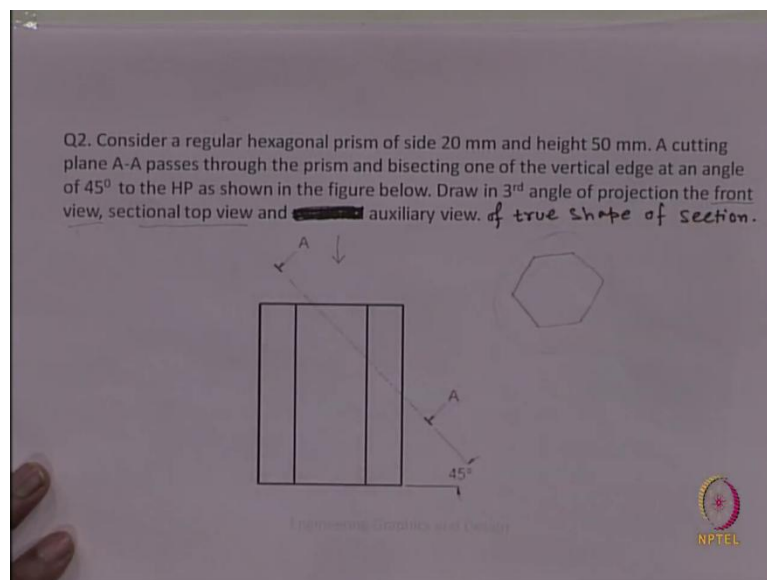
So, if you see the question, the first question is the draw the third angle projection of front view, we could draw the front view but in front view, we know this is the dimension of 20 mm, but we do not know this dimension. Mathematically you can calculate those dimensions,

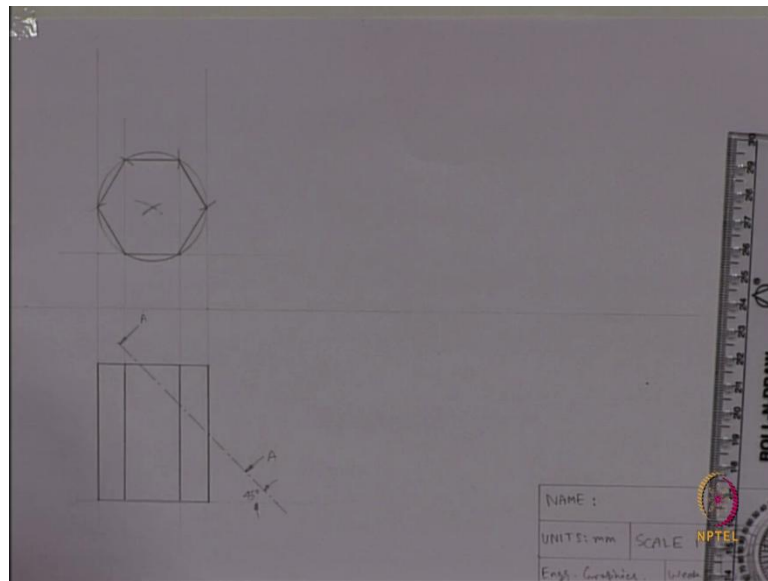
but in our engineering graphics class, we would not ask you to do it mathematically. Rather, we will suggest you to do it geometrically.

That is why fast I have drawn the hexagon in top view from these we will get the construction lines or projection lines, and then we will draw the front view. Similarly, here also. So, the front view is very simple. This is exactly what has been given in the question. And both the front view and top view I am drawing at a distance of 20 from the reference line.

This is interesting see, what we have got for the like the middle edge is definitely 20, and these two we have got as 10 each. The side lane is actually 20, but when you look from the front the inclined surface, the projection length will be 10 only. The length is or the height of the hexagonal prism is 50. This is the outline, and these are the edges we will be looking at. The front view is completed.

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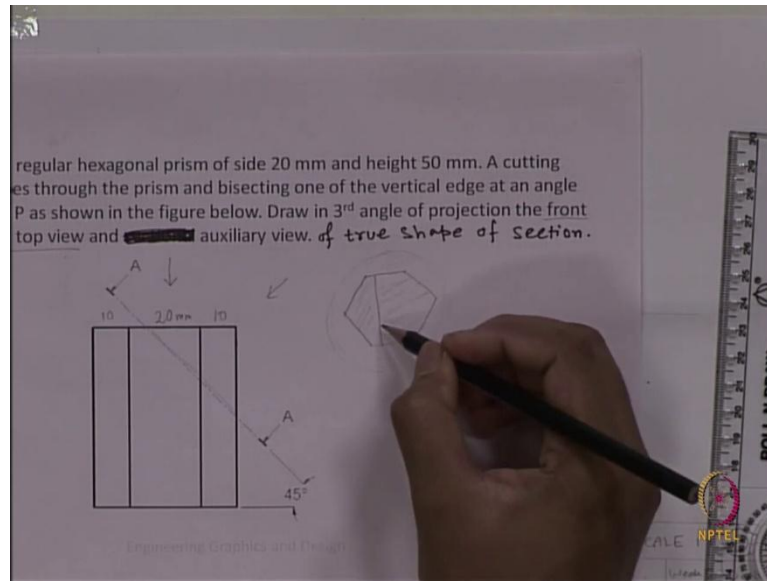




The top view, we have drawn only the hexagon, but we have been asked the sectional top view. For that, first, we have to look at the cutting section, which is shown in the front view. The cutting section is at an angle of 45° .

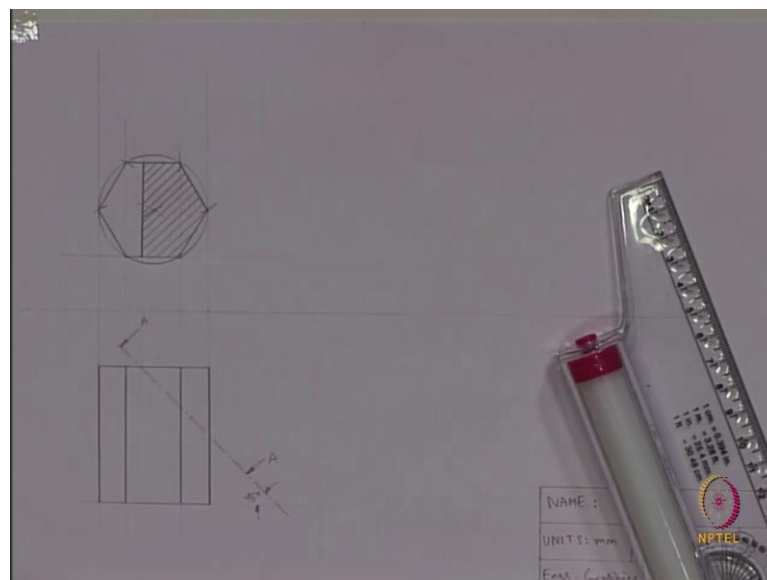
We can use this actually for getting the angle, this is 45° , and then we can join these two lines 6:1 those lines. This is the section plane, and the viewing direction is also shown. This is our cutting plane, where this angle is 45° . So, if this is the cutting plane and we are looking from this direction.

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Already from the hexagonal prism, this whole part has been cut. So, what you will see? You will see a whole surface some part, the top view will be something like this, this part will be like a horizontal plane and this part will be an inclined plane. Those two planes are different and then in between lines so we will represent using a straight line. So, this will be exactly on top of this.

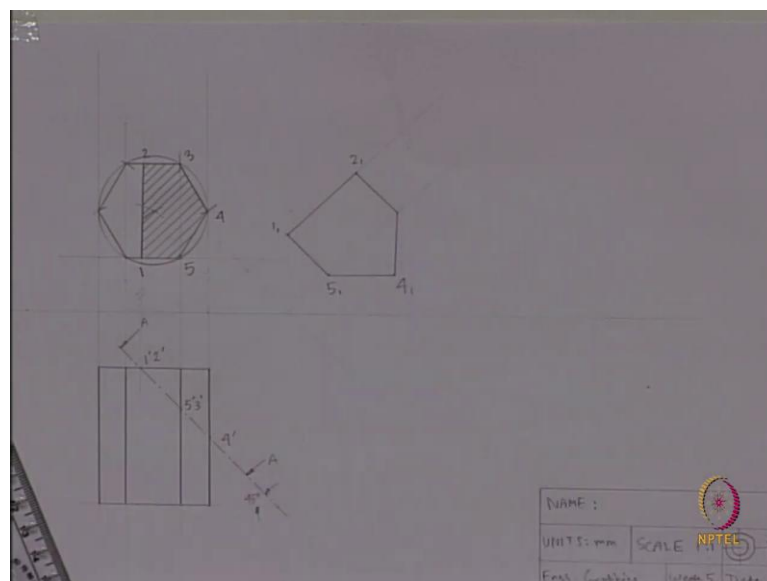
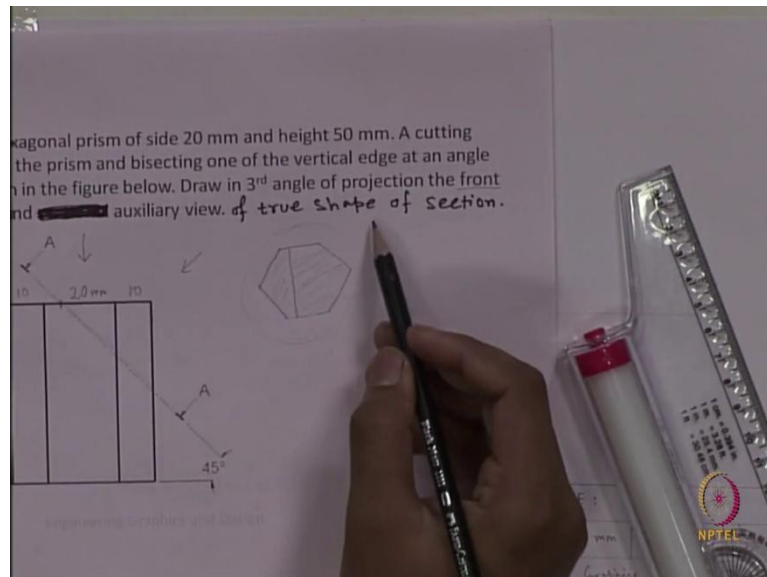
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So, here from here the sectioning has been started, so on top of this, we will get that line which will differentiate the two different planes. From the reference of this. And this part was after the cutting. So, this is the part after sectioning. And what we do? We have to make the section lines here, we have to make the sectioning lines. Already, we got that 45° here, so

from here only we can take the reference for drawing the section lines. The front view, and the sectional top view is completed.

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The next part is that auxiliary view of true shape of section. So, before going to the auxiliary view, we have to understand certain things. Like what we will be seeing at auxiliary view. The auxiliary view we have to draw for the true shape of section. This is the section, but this is an inclined one. This plane is actually inclined one. So, in the top view you won't be able to see its exact size or exact shape that is why we want to take the help of the auxiliary view. In this case that top view will be the related view.

So, when we will be drawing the auxiliary view, we will take the dimensioning-related helps from the relative view or top view or the other help, like the positioning and all like it will be

parallel to the section plane the reference plane those kind of help we will be taking we will be taking from the adjacent view that is the front view.

And before going to the auxiliary view, we just want to name this. We want to name the points of this section. Let us say this is 1, this is 2, this is 3, this is 4 and this is 5. And what will be the corresponding points in front view? Already we have been covered in the lab of week 3 that we will use prime while giving the names in front view.

So, this will be 1'2' because, if we look from this direction, in the front view, 1 will come at first two will come 2nd. And this point corresponds to 5 and 3 this will be 5', 3' and this will be 4'. For the auxiliary view, as this is the cutting plane, the reference plane has to be parallel to the cutting plane.

Let us say, we will draw somewhere here. So, this is our reference plane for the auxiliary view. As the top view, sectional top view is the related view, so we have to measure dimension using this sectional top view. Before that, we just want to keep that outline. This will be one outline and these will be another outline. Within these outlines the view will be situated.

So, like point 5 and 3 will be situated on this line point 1 and 2 will be situated on this line and point 4 will be situated on this line, but the dimension wise we have to rely on top view. So, for point 1 this is the reference line, so what is the distance from reference line to point 1, in case of top view, this is the distance.

I am just marking here, but you should not mark while making the drawing. Let us say, what is here this distance is 20. So, here also from the reference line, we have to consider a distance of 20 to get the point, actual position of point 1. The projection line already we have drawn from the front view, and on top of that, using the dimensions from top view we will get the actual position of point 1.

This is the position for point 1. And what is the position of point 2? From point 1, you have to take a distance of around 34. So, from here, this will be the position of point 2, and now we will join point 1 and 2. This line corresponds to this line in top view. 1,2 here and 1,2 here. So, here we will be just marking it like 1_1 , 2_1 . These markings we will be using only for auxiliary view.

And again we have to get another three points like 3,4 and 5. 3 is at a distance of, rather we should actually measure from reference line. The distance of point 3 from reference line is 55

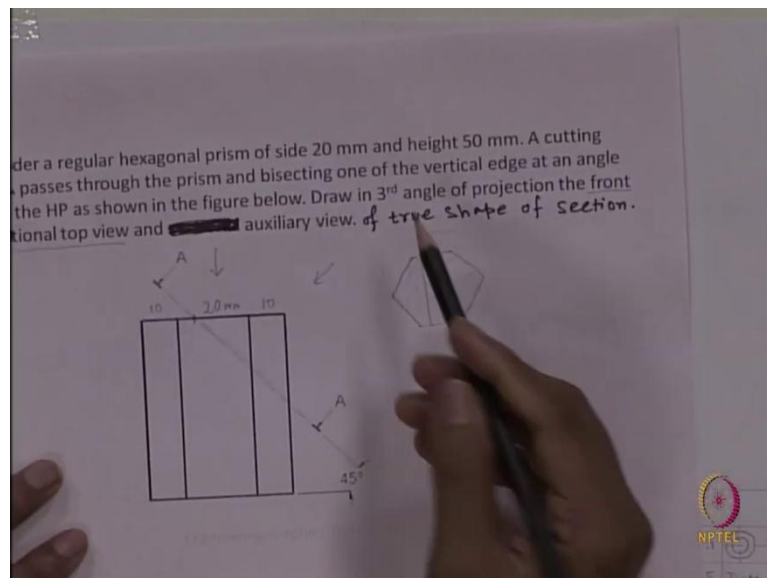
almost, sorry, 54. This is the reference line from here for the point 3 we will be measuring. This will be the position for point 3.

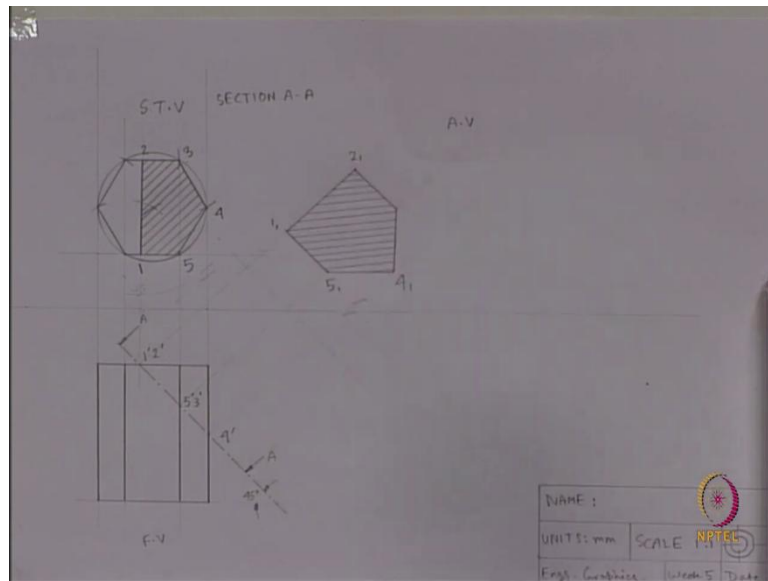
In last cases also when I said, the all distances should be measured from the reference line for point 1 for point 2, for point 3 as well as point 4 and 5. Every cases the distance will be measured from the reference line these distances. Point 5 has a distance of 20 from reference line, and on the projection line from front view we will measure 20 from the reference line.

Now, we have got point 5 here, point 3 here. Point 5 had a distance of 20 from reference line. Here also, this is point 5. It will have a distance from 20 distance of 20 from reference line. So, we have to join point 1 and 5, point 2 and 3. The rest is the point 4. The position of point 4 will be on the projection line drawn from front view, but the distance, exact location of the point we have to get using the distance from top view.

That location is, it is like around 37 from the reference line. So, from this reference line also we have to choose a distance of 37. This will be the position of point 4. If we join this, we will get the auxiliary view of true shape of section. This is the auxiliary view of point 4. All the superscript we will be using here in case of auxiliary views. Point 1 here, point 1 here in the front view, and point 2 here in the auxiliary view.

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In the auxiliary view also, as we have been asked to show the auxiliary view of true shape of section. So, we have to show that section in auxiliary view also. And we will show the section in such a way that the actual section lines should not be parallel with each of the outline. It should not be parallel.

We have drawn the sectioning even for auxiliary view also. So, now I think, we have got the every component we need. We needed the front view, sectional top view, and auxiliary view have to shape of section. This is the front view along with cutting plane. After cutting, and we have got this sectional top view.

This part is the section, and this is the auxiliary view of true shape of section where we have taken the projection line from front view, which is the adjacent view and to get the exact location of those points we have taken the help from relative view, which is the sectional top view.

So, these distances are equal, these distances are equal actually from the reference line, but these marks you should not show when you will be drawing. This is the sectional top view. And if I write it, I should write it, Section A-A, this is the front view and this is the auxiliary view. This AV and FV you should not write, but this thing you can mention Section A-A. Dimensioning, we are not asked to do the dimensioning so we will not do. So, this is the answer for question number 2. Thank you. We will again meet in the next lab.