

Our Mathematical Senses

The Geometry Vision

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Lecture - 10

Video 2C: the second perspective view revisited

So you've now drawn the third perspective view using just a straight edge. And in the intro video, we talked about how in a way that's the easiest to draw. And I still believe it's the easiest to draw. But one surprising thing about the second view, which I want to come back to now, is that it's also possible to reconstruct this second view from a single tile using only a straight edge. In my opinion, it's a little harder than the puzzle we just did with the third perspective view, but it is possible. And that's the challenge I'm giving to you now.

Can you figure out how to do it? In other words, if you just take a single tile. Forget the rest. Can you extend and reconstruct that perspective, that grid perspective view from this tile? And to begin with, let's do the exercise. I want to encourage you to do the exercise that we talked about in the introduction to this chapter, which is to draw, which is to extend a trapezoidal tile like this into a set of evenly spaced railway tracks.

If you can do that, the rest is not that difficult. So really, this is the crux of it. Can you extend this tile to a set of evenly spaced railway tracks? You get something like this. And again, the catch is that this is only using a straight edge and a pencil. No compass, no measuring device, so no measurements.

You can use a ruler as a straight edge. You can use it to draw straight lines, but you can't use the markings to take measurements. So using just your straight edge and your pencil, can you extend this tile to a full set of evenly spaced railway tracks? And just so you know, you can use any trapezoid. So you can either trace this trapezoid onto a sheet of paper, or you can click the link to print it out. But you can also just use any old trapezoids.

If you can have any other way of drawing a trapezoid, by the way, and for drawing that trapezoid, you will need to use either a compass or a measuring device, because this top line and this bottom line are parallel. So with just a straight edge and a pencil, you won't be able to draw this initial trapezoid. But if you start with a trapezoid, I claim you can extend it and draw the full perspective view with just a straight edge. So start with any trapezoid and try this yourself. Once you've completed the railway tracks, it shouldn't be hard to complete the tiling, the second perspective view.

But it's not trivial, so do don't don't you know, you might have to think a little bit. It takes a little bit of cleverness, but it's using tricks that we've seen before. That's a small hint. So try this yourself, and then once you've tried it, you can watch the next video, which shows one possible solution.