

Do problems 3 and 4 from Lesson 2 in "Lessons in Math and Art". The first one of these involves finding the perspective images of enough key points on a house to be able to draw the outline of the house. You'll *definitely* want to use Excel for this. I'd suggest plotting the points by hand rather than in Excel as he suggests – it may take longer, but it looks better and you can follow more easily which one is which, and label them. The second problem is to come up with 3 dimensional coordinates for some windows, a door, a yard, and a chimney (where the bottom vertices of the chimney should preferably actually lie on the roof, although that gets hard), and then to find the perspective images of those new points and add them to your graph of the house. You don't have to do exactly the same features of the house as the author of these lessons suggests; feel free to get creative if you'd like.

The main intention of this project is the second part – finding the coordinates of your door, for instance *in 3-space*, and then *converting them* using the perspective theorem. If you are tempted to simply draw them in in 2-space, using the laws of perspective, you might as well wait until Project 6.

For this, you don't really need to write an accompanying paragraph.

*Possible points:* A plot of a house which has been extensively personalized *using 3 dimensional points converted to 2 dimensional points* can receive up to 30 points. Converting and plotting in 2D only the given points can earn up to 15 points.