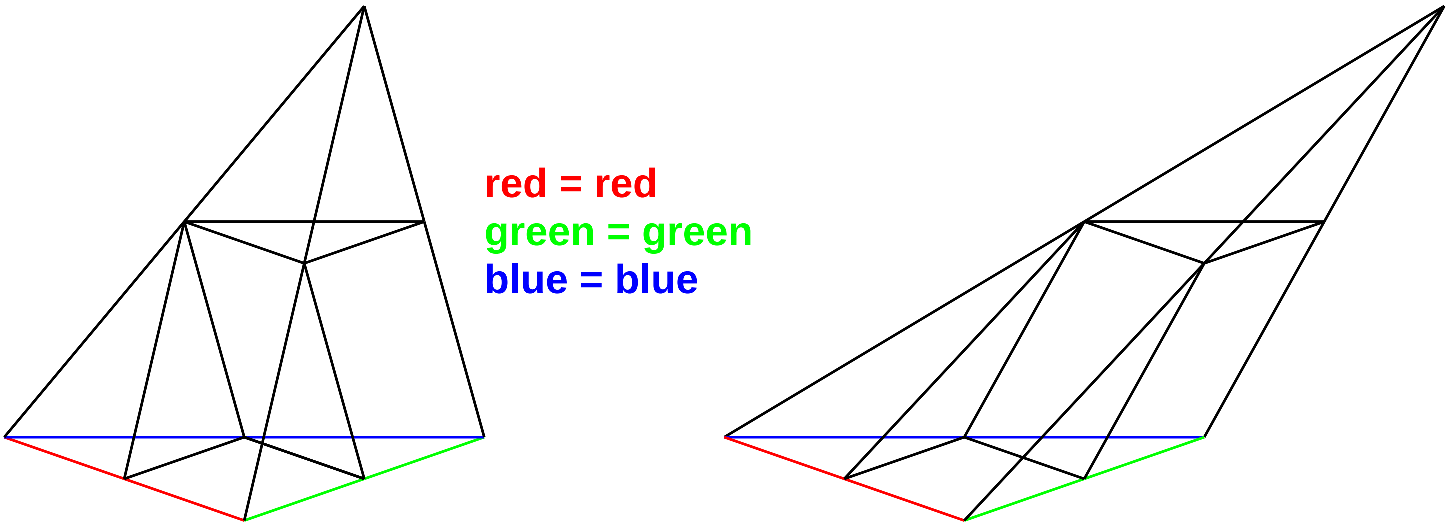
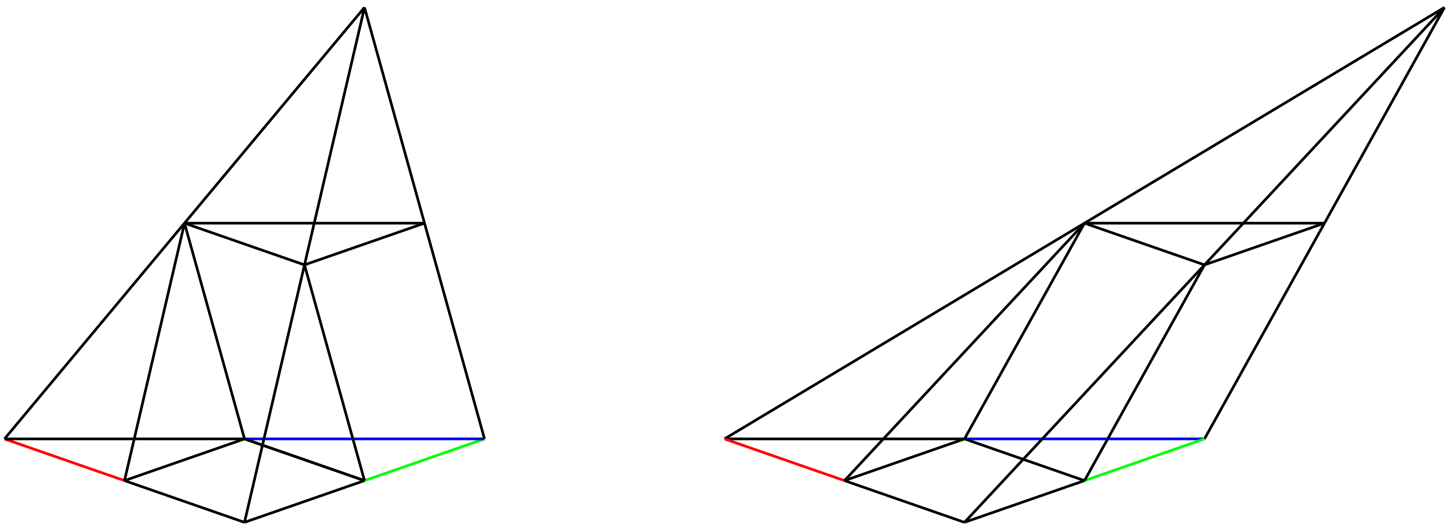
Next to be proved is a very specific situation for Euclid XII prop. #4.
I shall show that if two pyramids have the same height with equal triangular bases, with all corresponding sides of their bases equal, and they are divided into two similar and equal pyramids, and into two equal prisms, then all four prisms are equal to one another

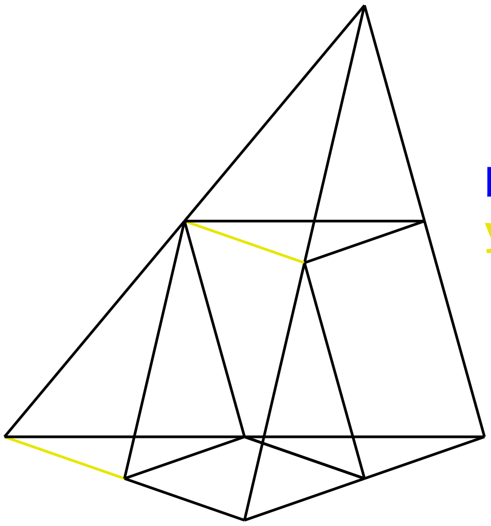
Let two pyramids with equal heights and equal triangular bases, with each corresponding side of the bases equal, be divided up according to Euclid XII prop. #3, so that they fit the criteria of having two equal and similar pyramids, and two equal prisms



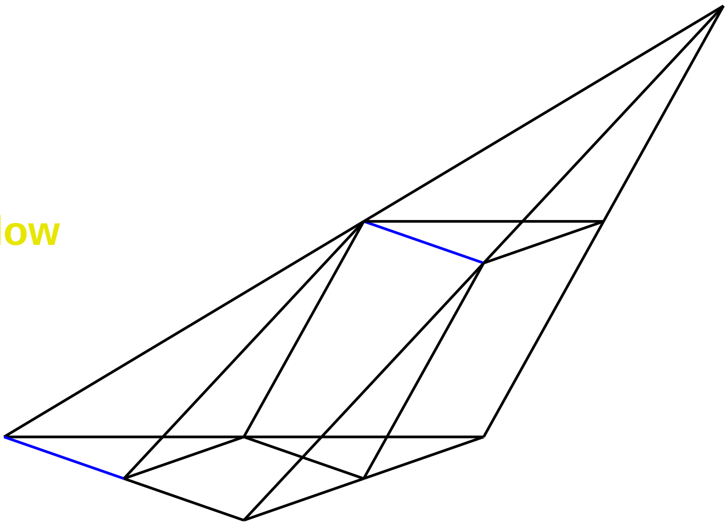
Because of the way that the bases are bisected, we see the following equalities:



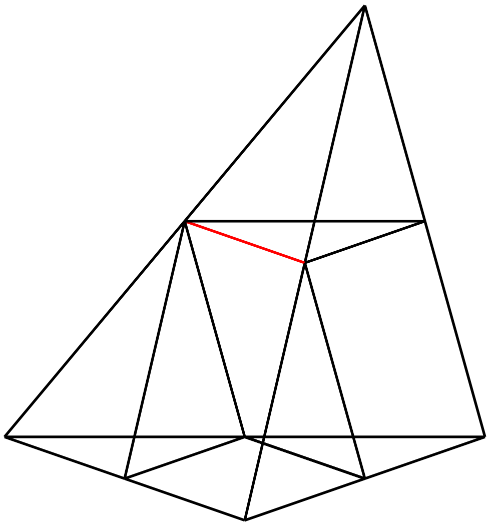
By the similarity and equality of the smaller pyramids:

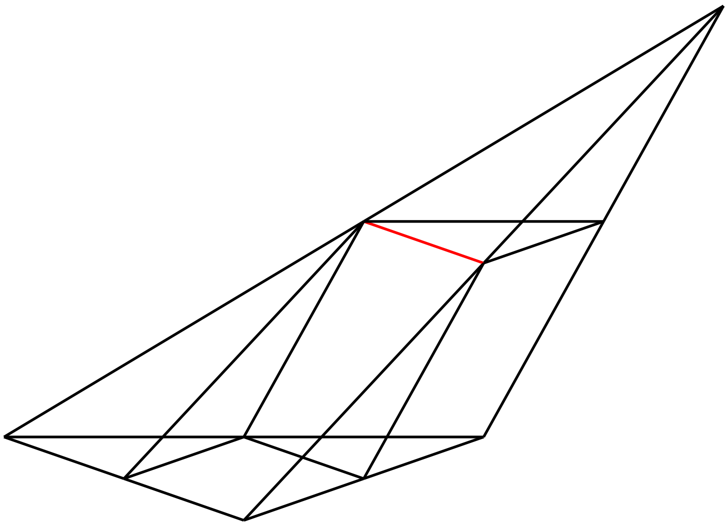


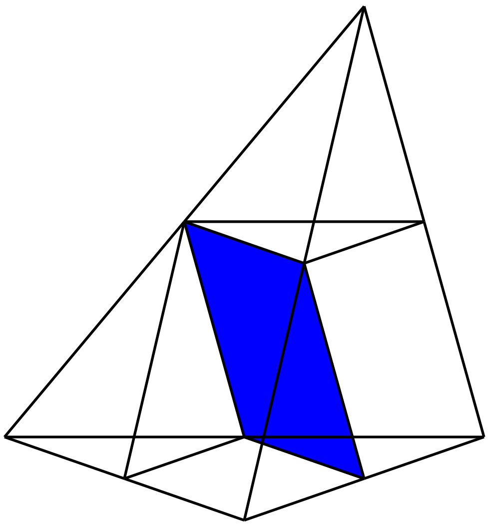
blue = blue
yellow = yellow

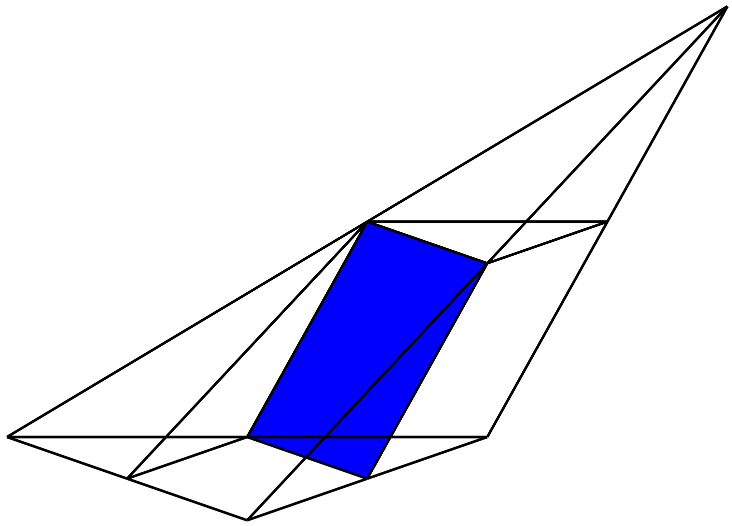


So therefore: red = red

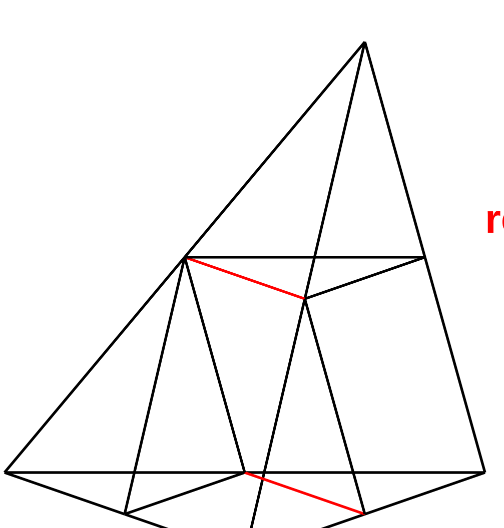




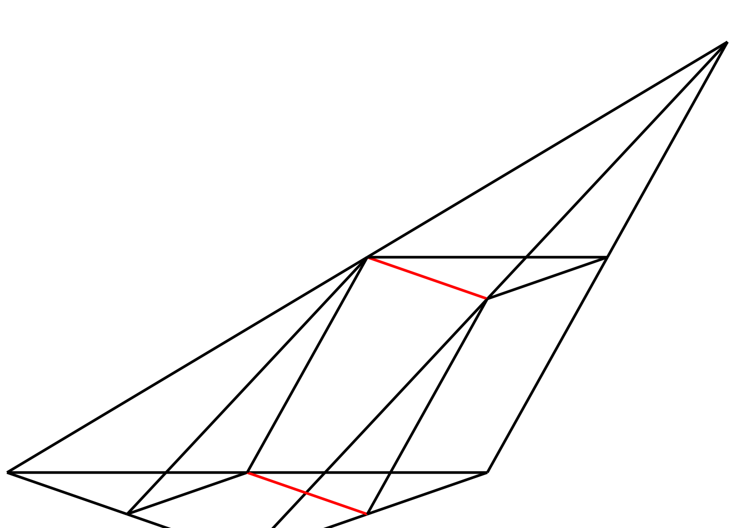




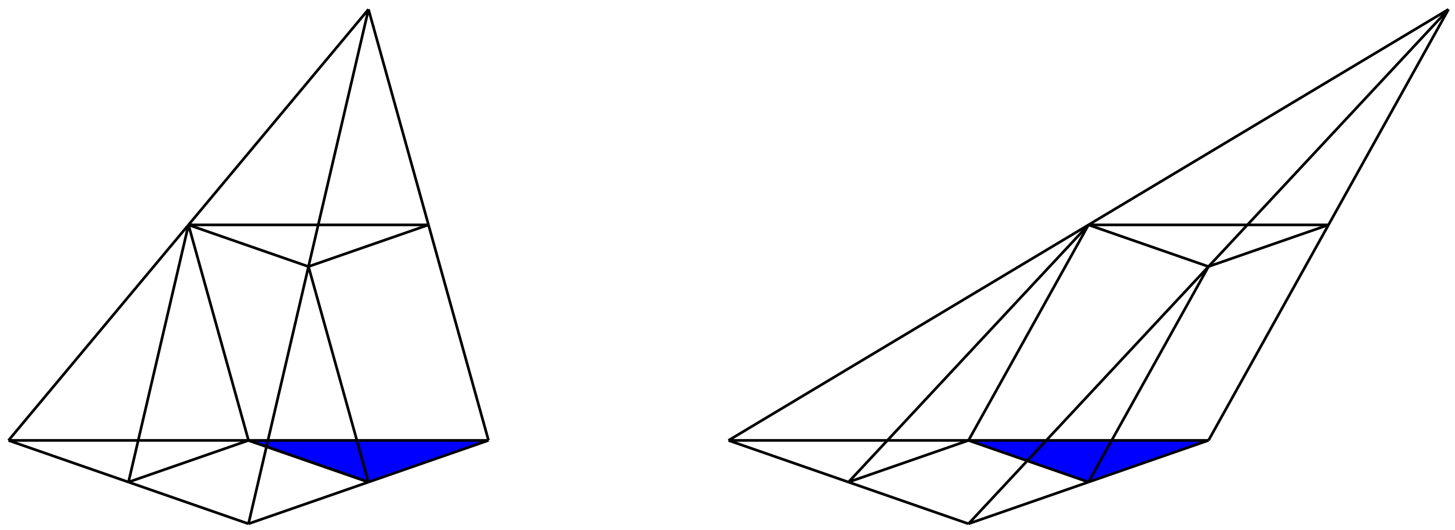
Since the above blue polygons are parrallelograms (as shown in the proof of XII prop. #3), their sides are equal, hence:



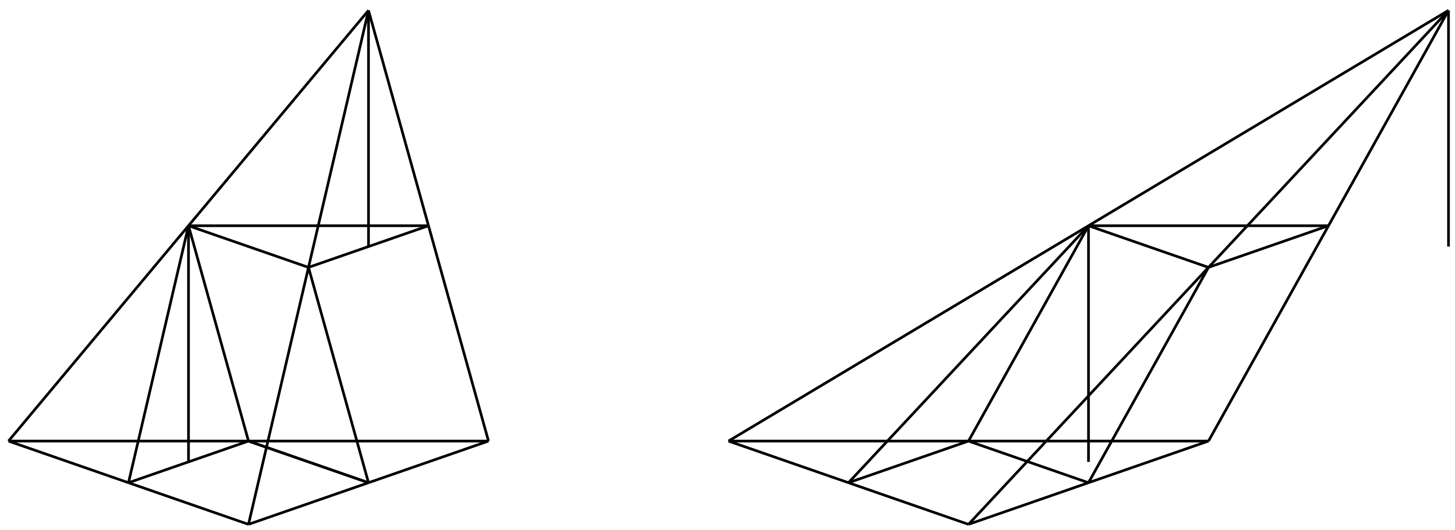
red = red



Therefore, the blue triangular bases are equal:
(Because all corresponding sides are equal)



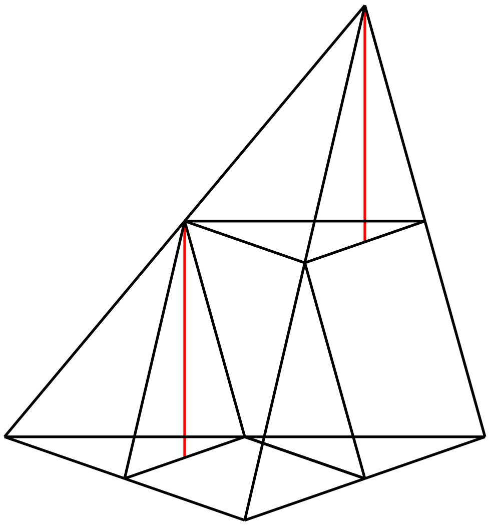
Now let's project lines from the vertices of the smaller pyramids onto the planes on which their bases are orientated, as shown below:

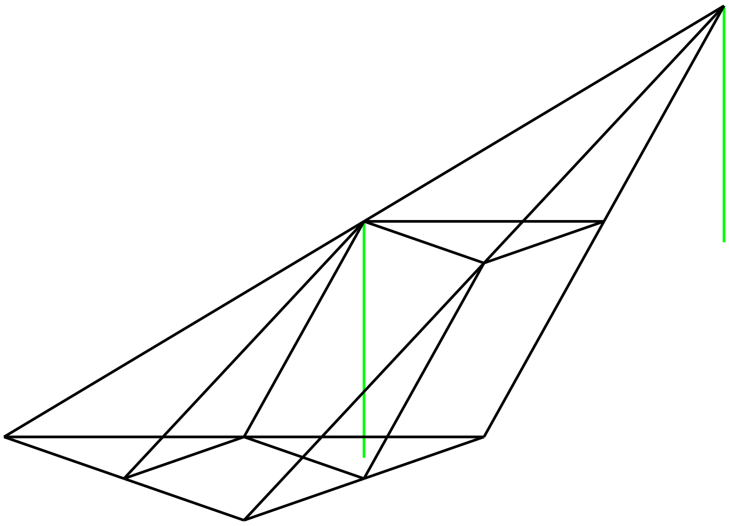


These lines represent the heights of the smaller pyramids, therefore:

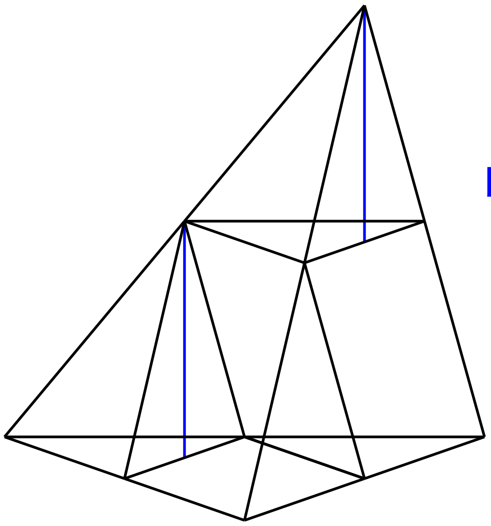
red = red

green = green

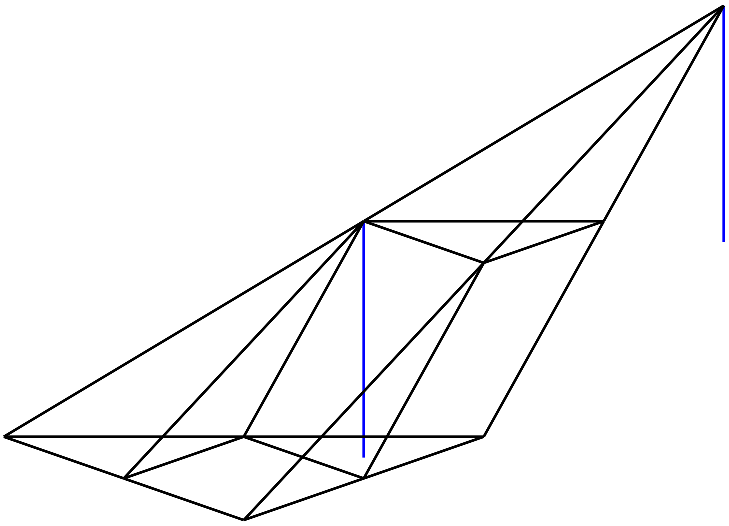




red + red= height of the larger pyramids, and
green + green= height of the larger pyramids,
Therefore, 2 x red = 2 x green
So we see that the heights of the four smaller pyramids are equal, hence:

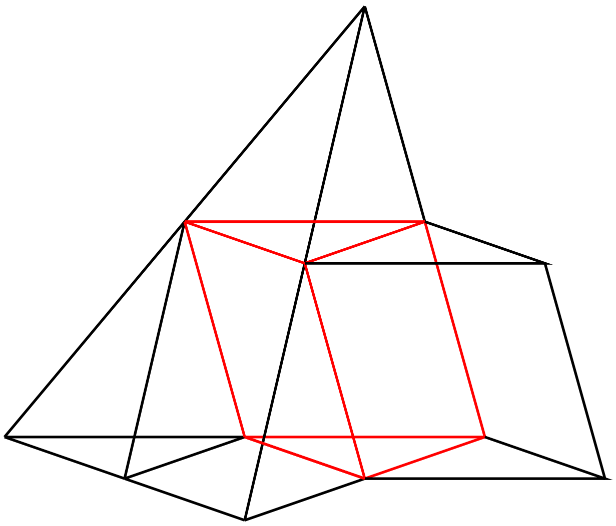


blue = blue



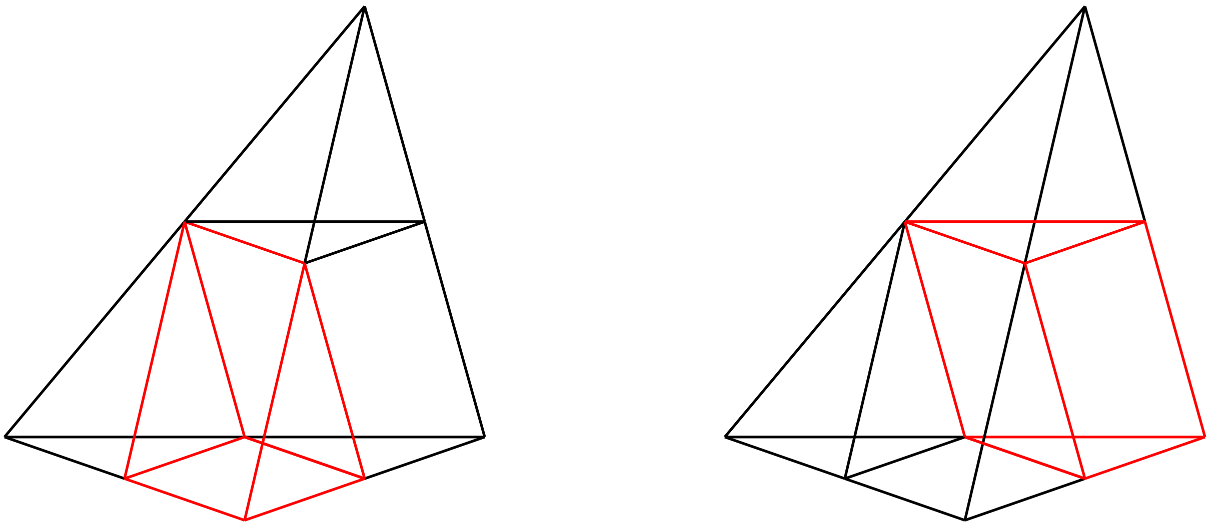
But the lines also represent the height of the prisms within each larger pyramid!

So we see that the prism on the left in, outlined in red, has the same height and base as the prism on the right, that's outlined in green:

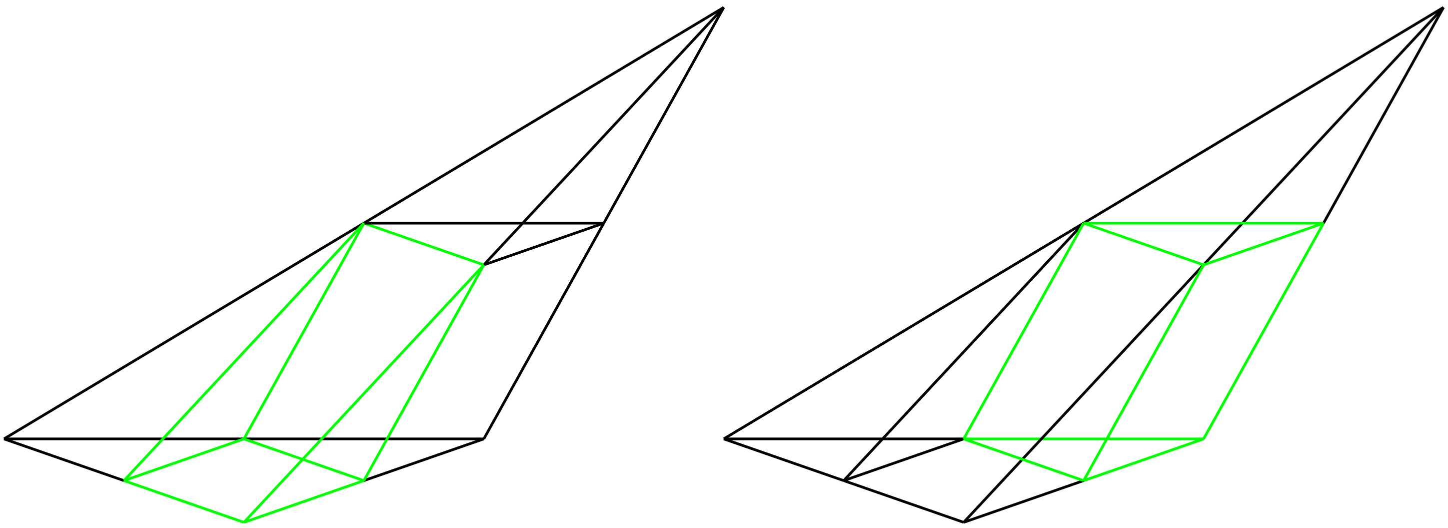


Therefore, said prisms are equal via Euclid XI props. #28 and #32, since both prisms correspond to equal parallelepipedal solids that have been bisected as the extension of the prisms above illustrates.

And since we know already that the prisms outlined in red are equal...



And the prisms in green are equal:



Therefore all 4 prisms are equal as desired