

Planar Intersections + Folding

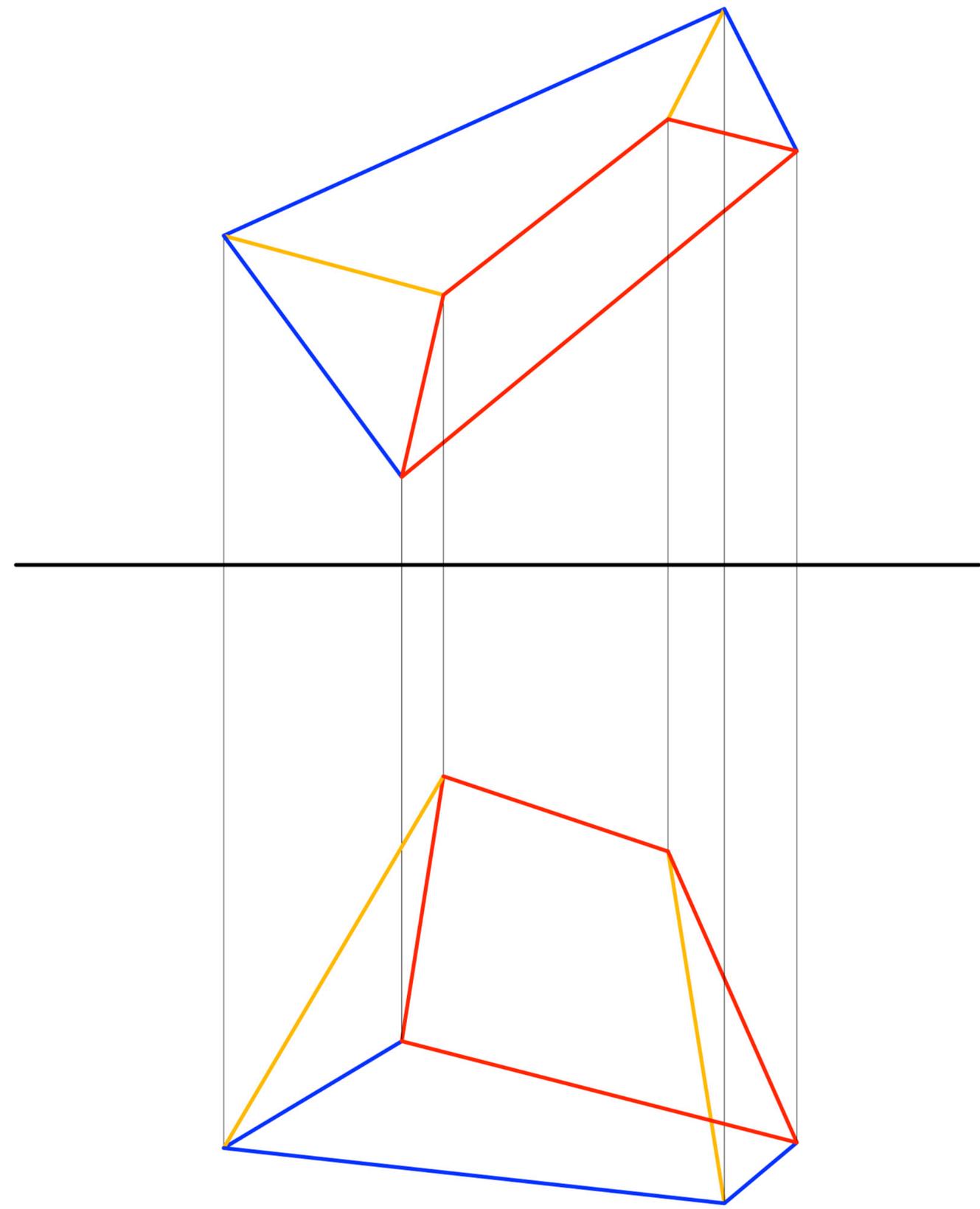
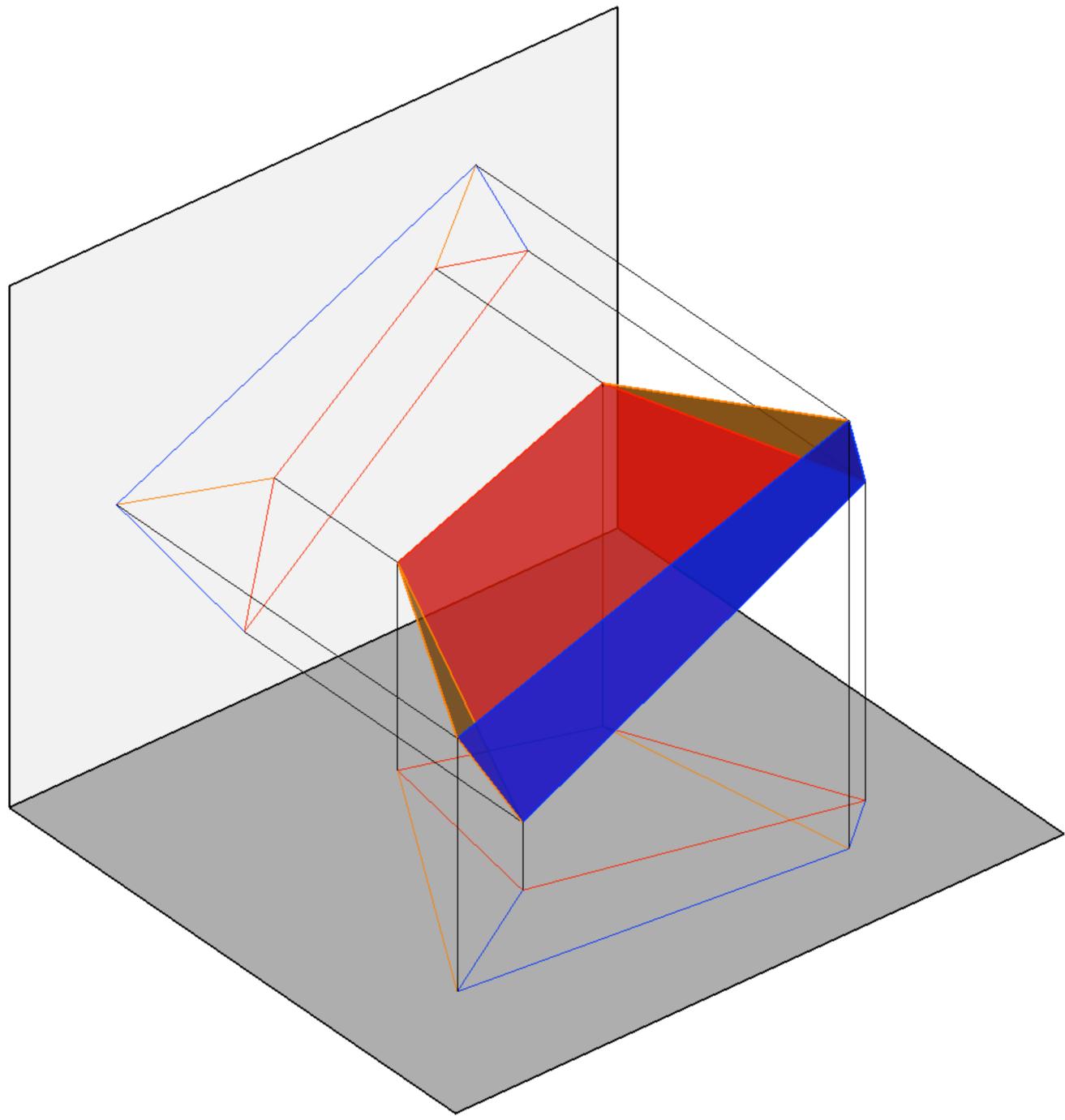
Planar Intersections + Folding

Given a planar spatial entity, use an intersecting plane to inscribe line segments on the faces. Following the methods described in exercise 1, trace these line segments through all projections, and ultimately into the true shapes of the plane figures. These intersection lines can be conceived as 'fold lines' in the object.

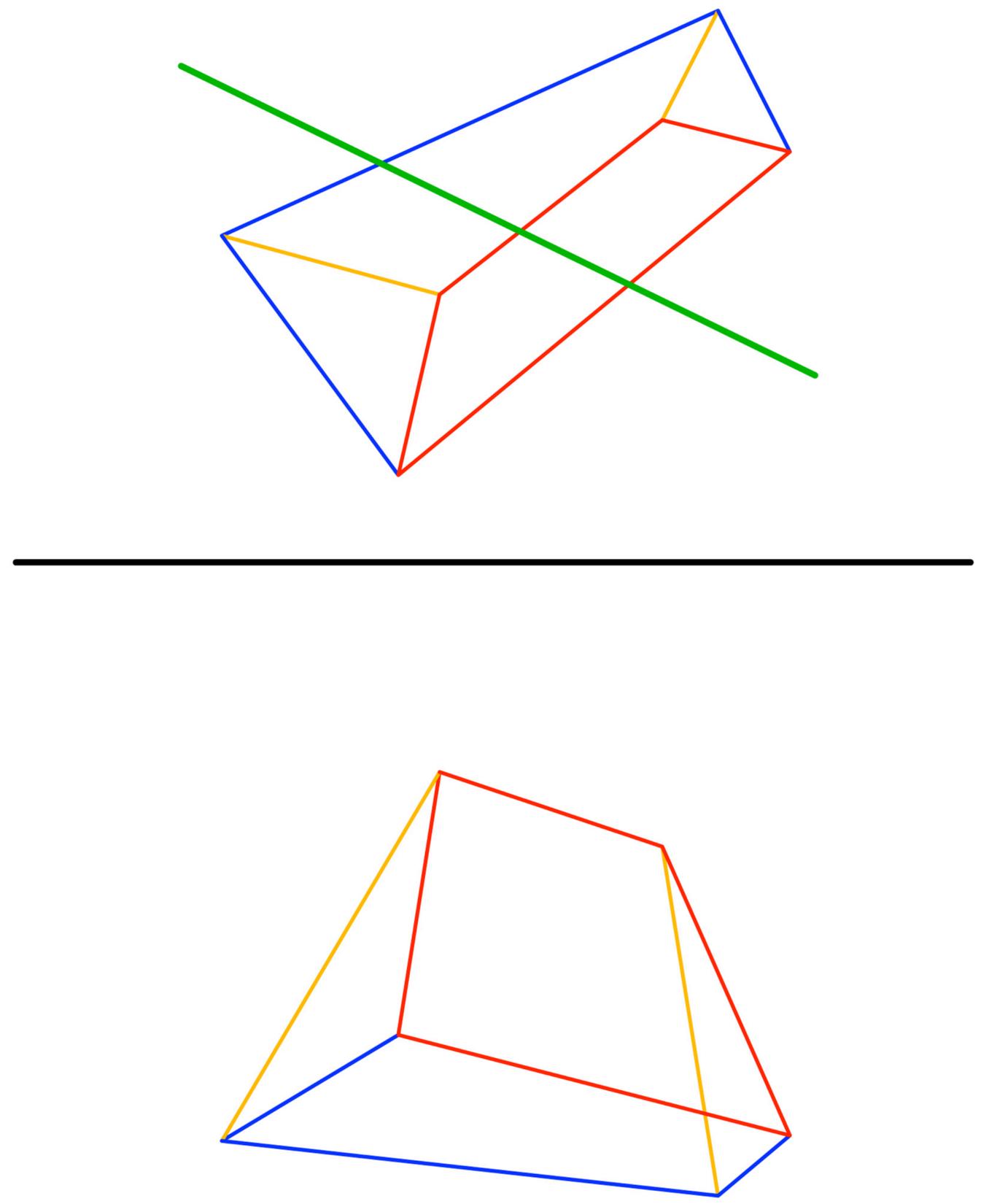
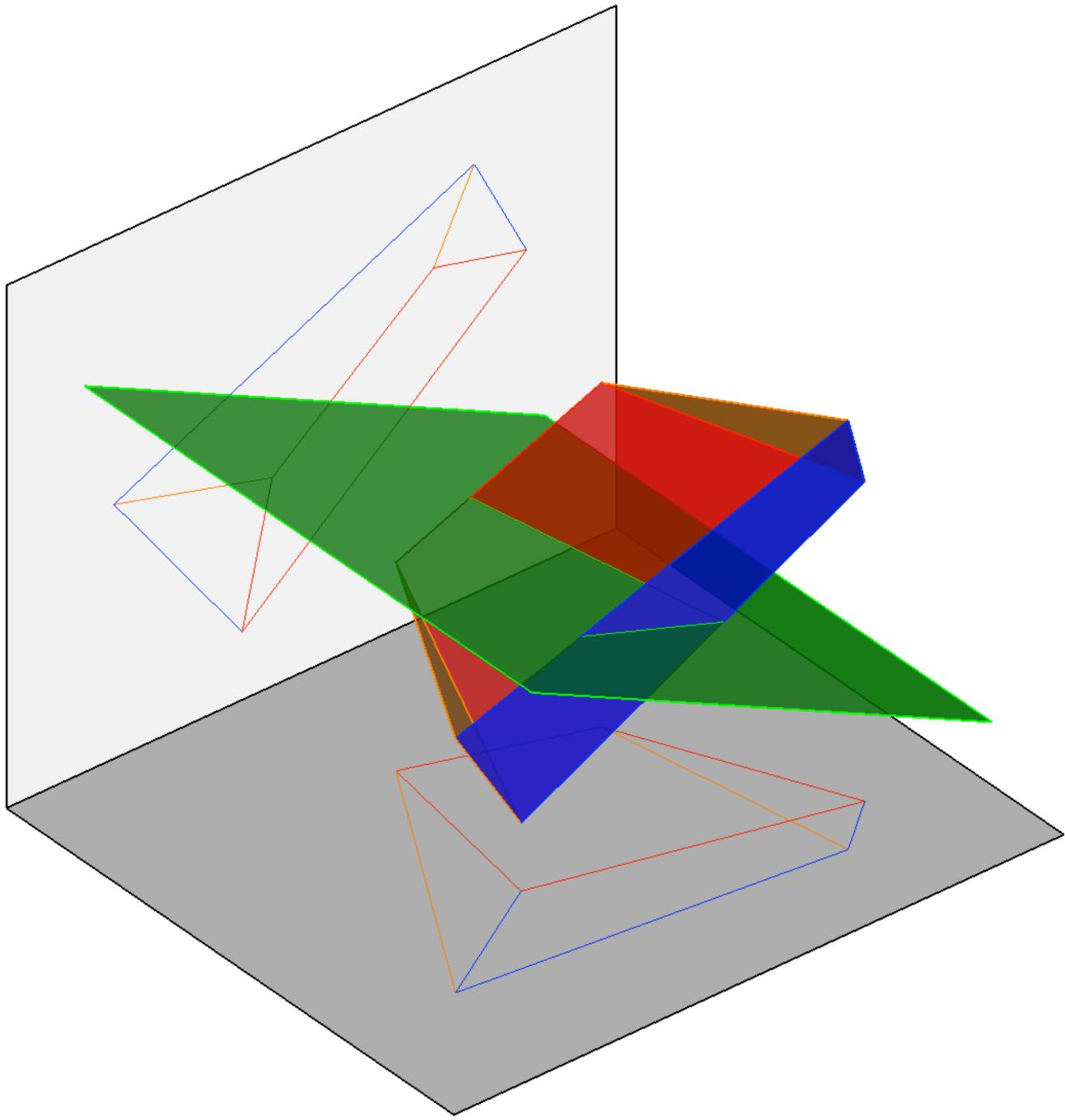
The resulting spatial entity has been split at the intersecting plane, with one half mirrored across the plane. The actual spatial fold (ridge curve, in general terms) naturally sits entirely on the intersecting plane, which is called the osculating plane of the ridge.

The process can be repeated with multiple planes (and therefore folds), so long as the resulting form is rigorously traced and considered at each step in the process, else, osculating planes will produce object self-intersections and other difficulties.

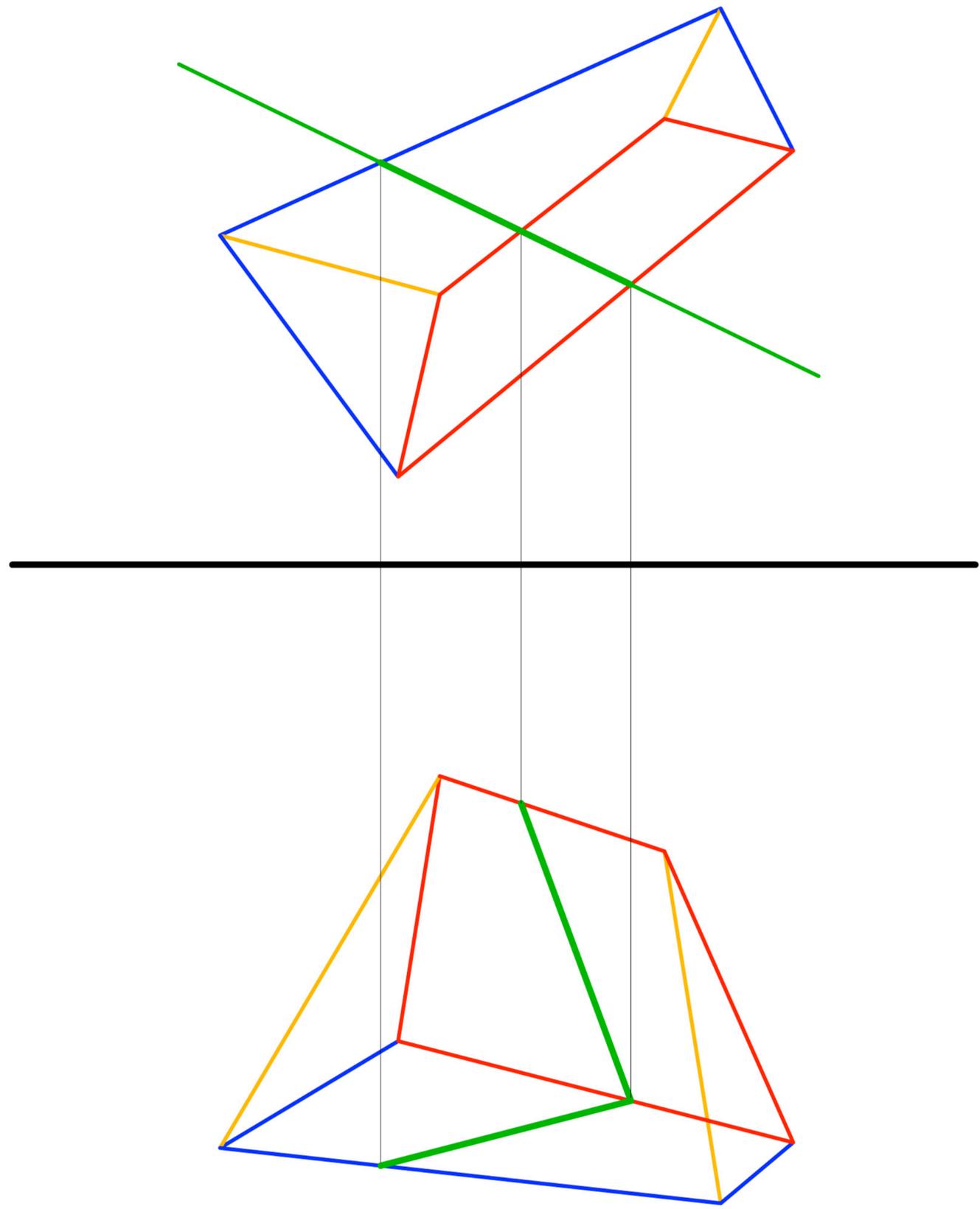
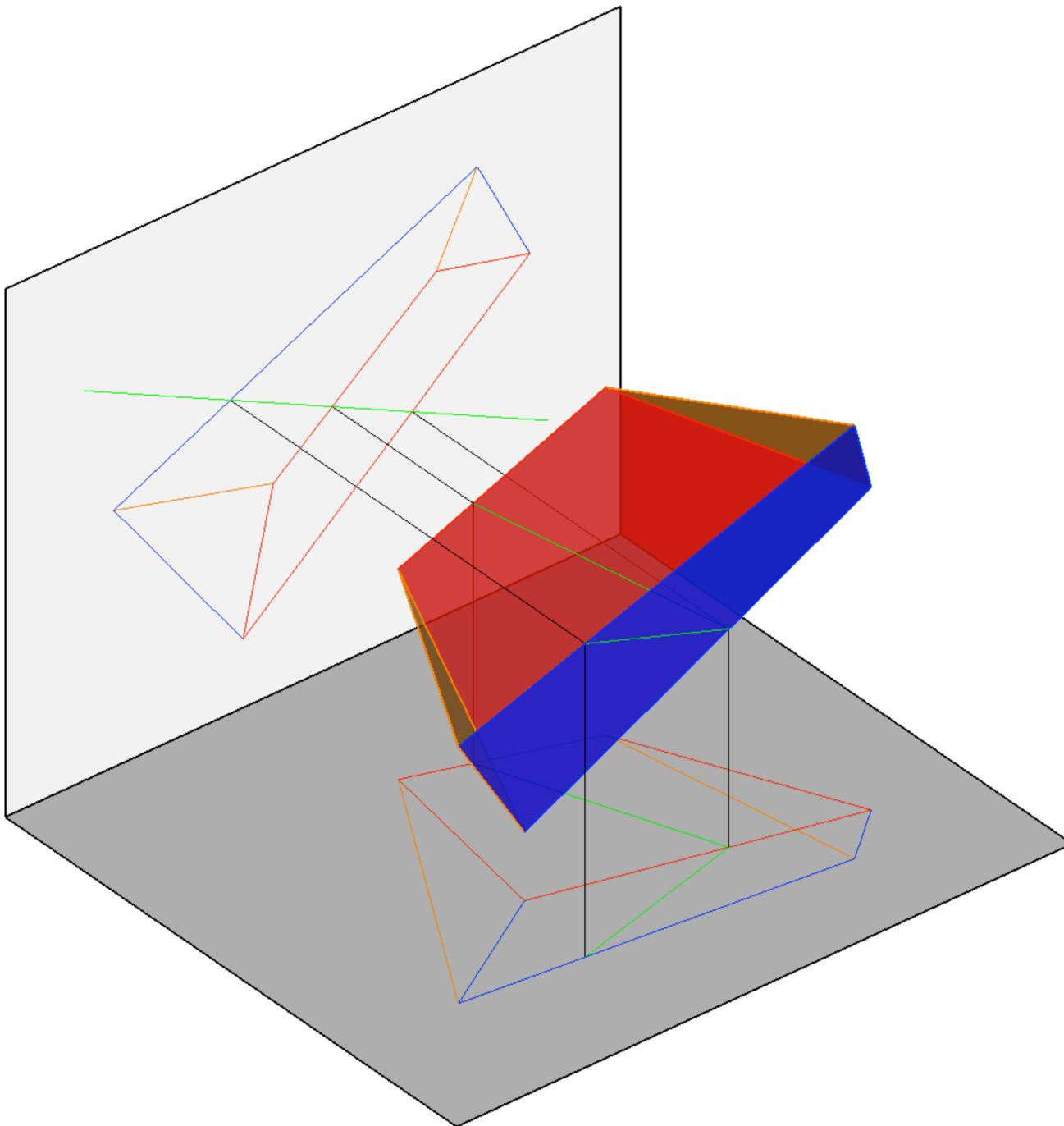
STEP 1: DEFINE FOUR ADJOINING OBLIQUE PLANE FIGURES (+ THEIR TRUE SHAPES)



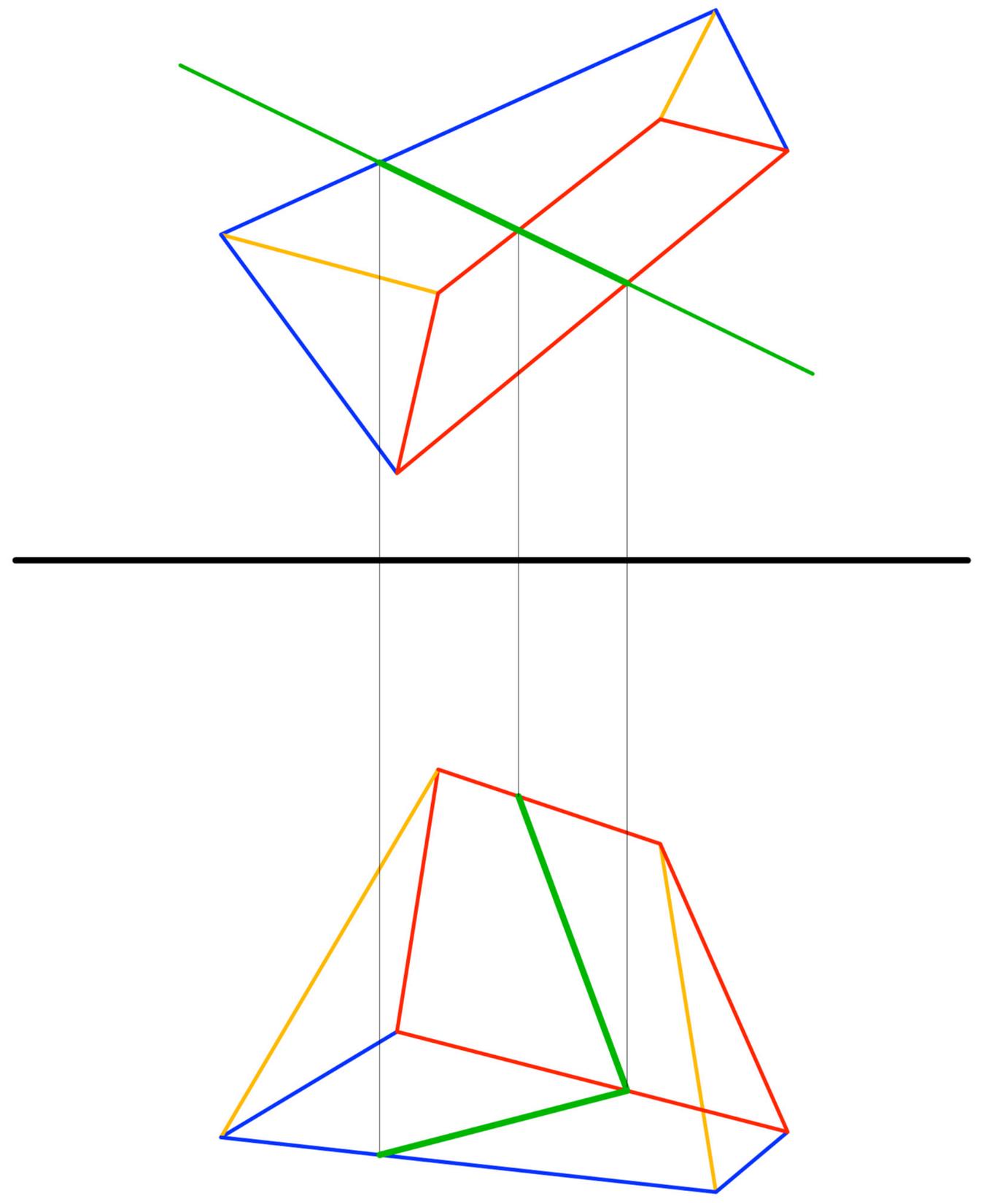
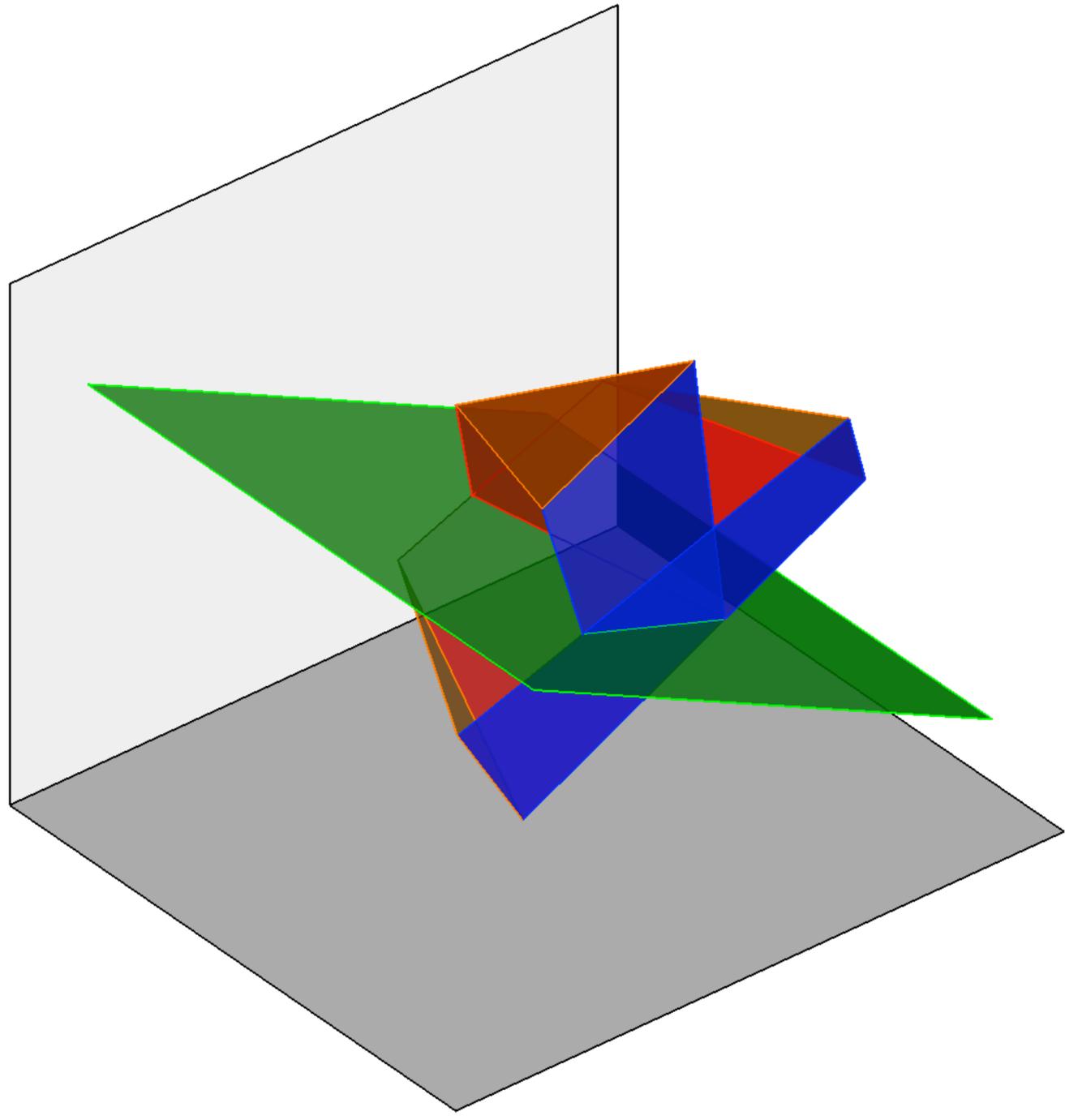
STEP 2: DEFINE AN INTERSECTING PLANE - USING A SPECIAL CASE RAMP PLANE, FROM EDGE VIEW



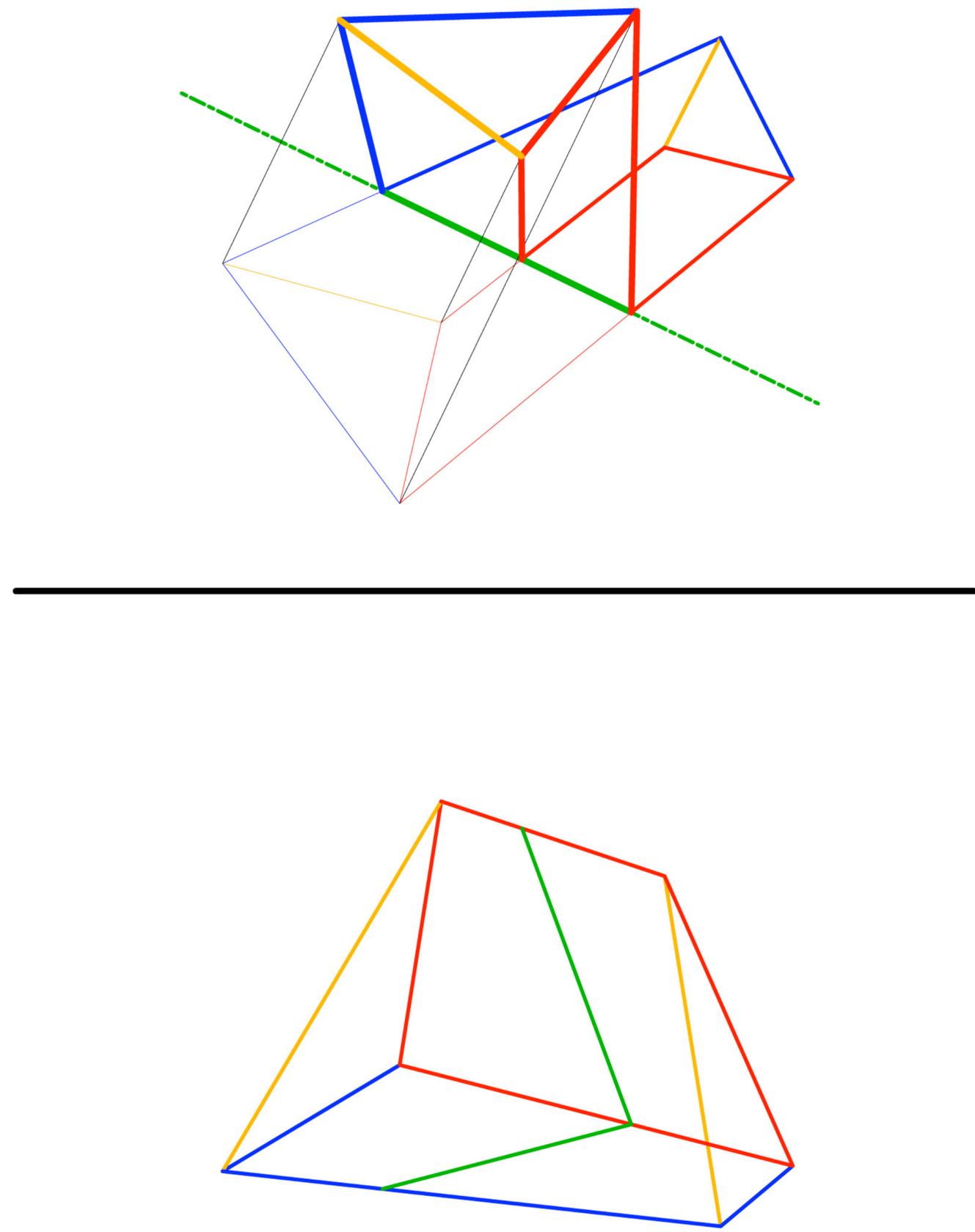
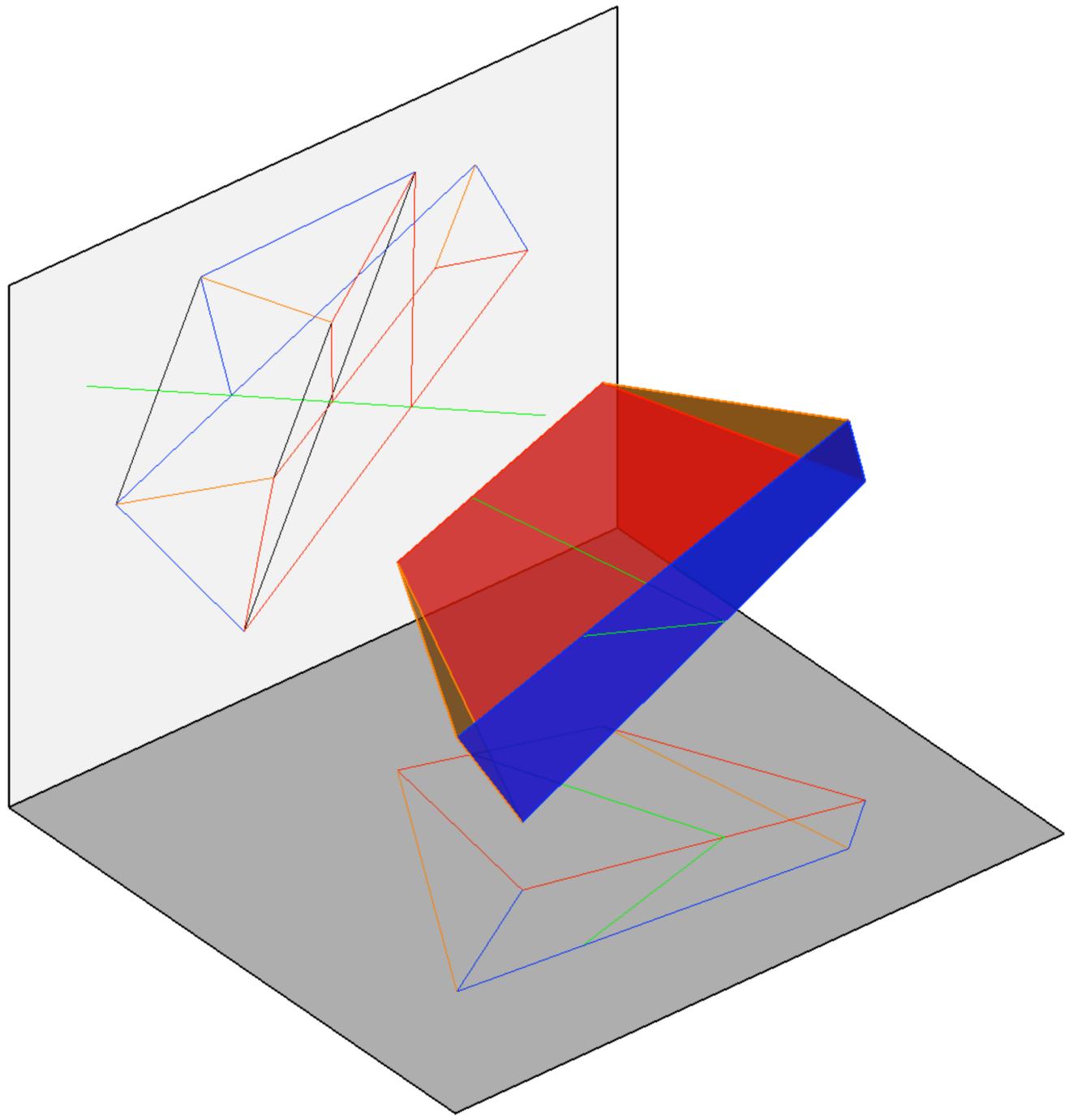
STEP 3: INSCRIBE LINES OF INTERSECTION ON PLANE FIGURES (+ ON THEIR TRUE SHAPE PROJECTIONS)



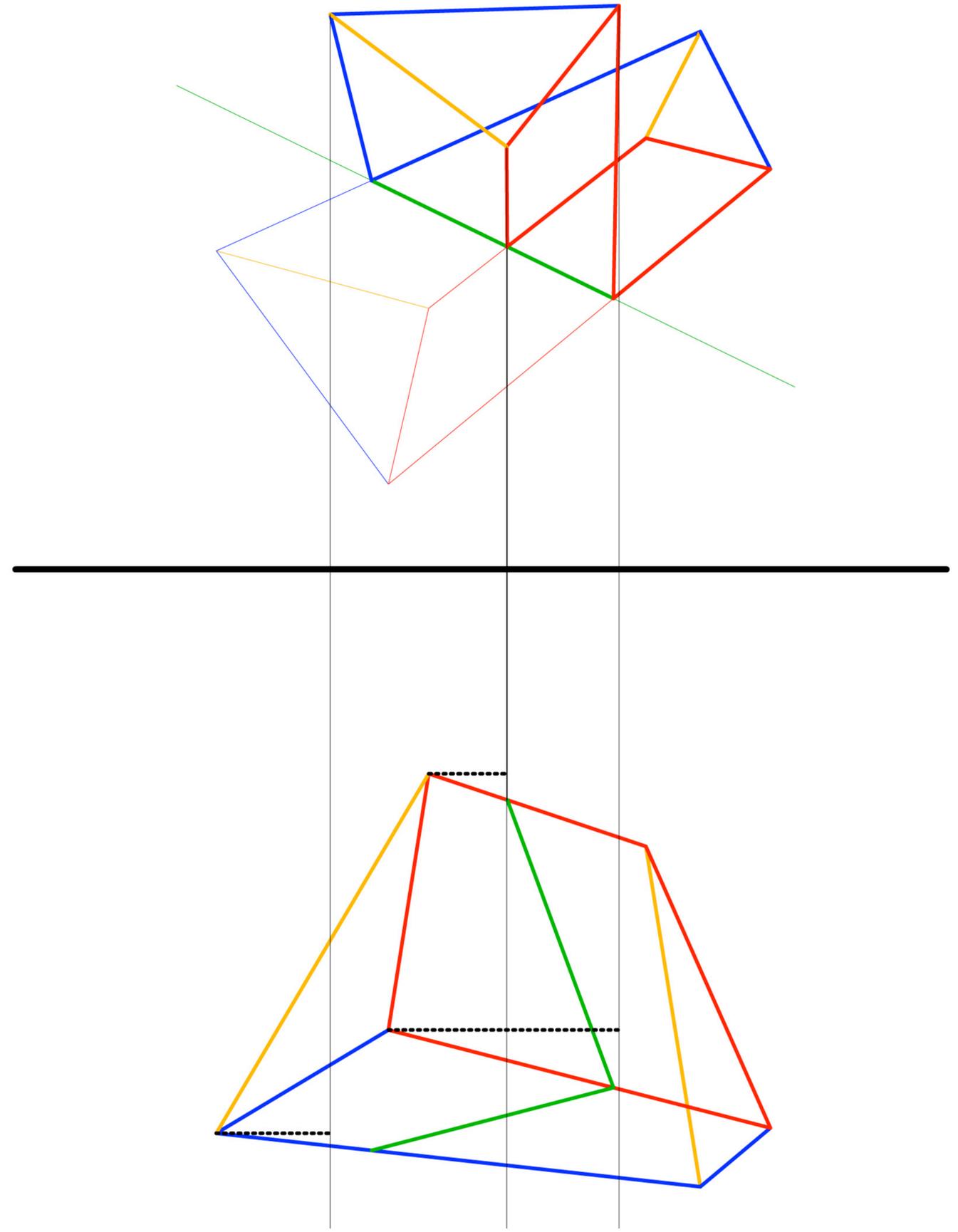
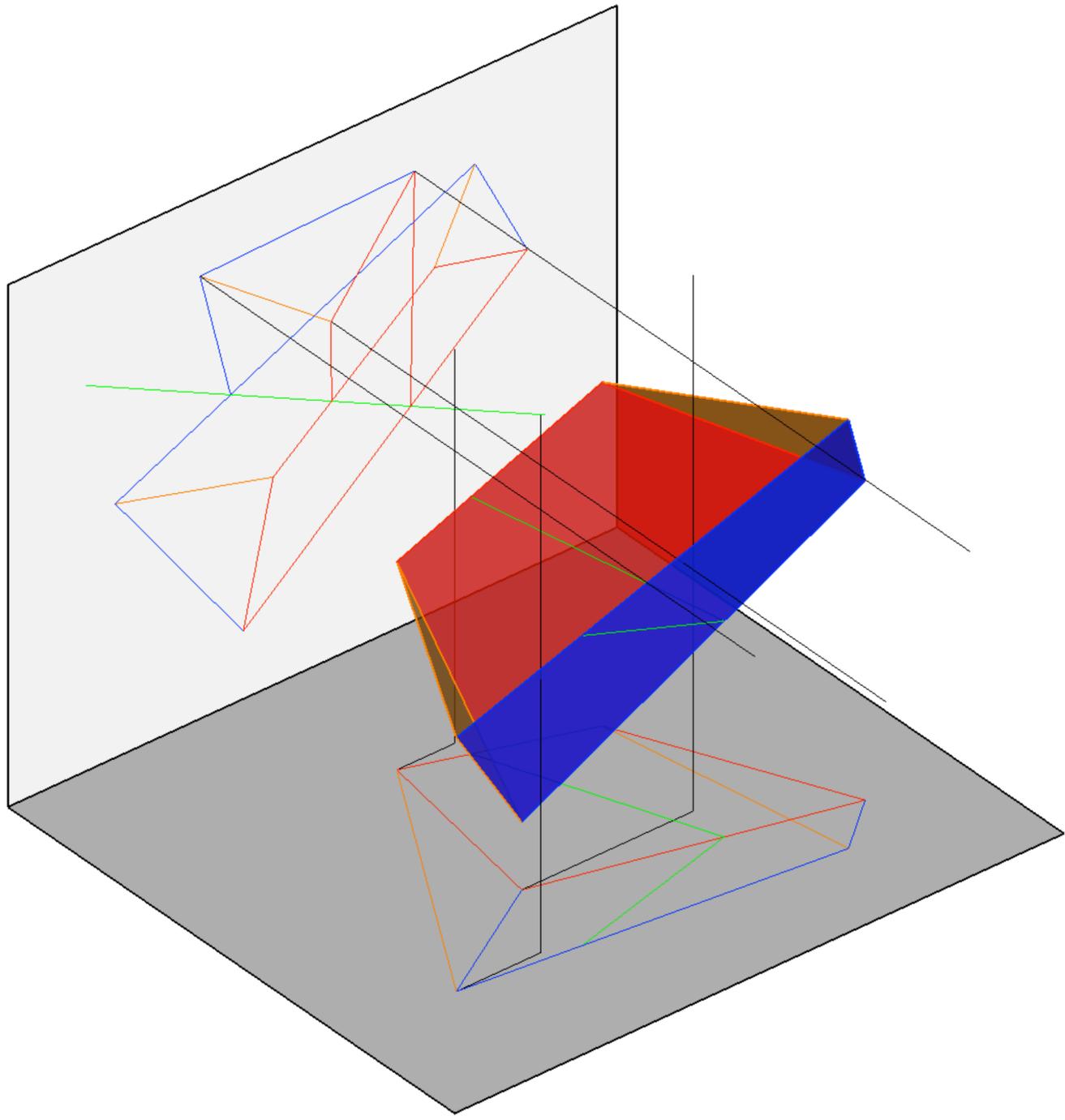
ASIDE: THE RESULTING SPATIAL ENTITY HAS BEEN SPLIT AT THE INTERSECTING PLANE, WITH ONE HALF MIRRORED ACROSS THE PLANE, PRODUCING A FOLD



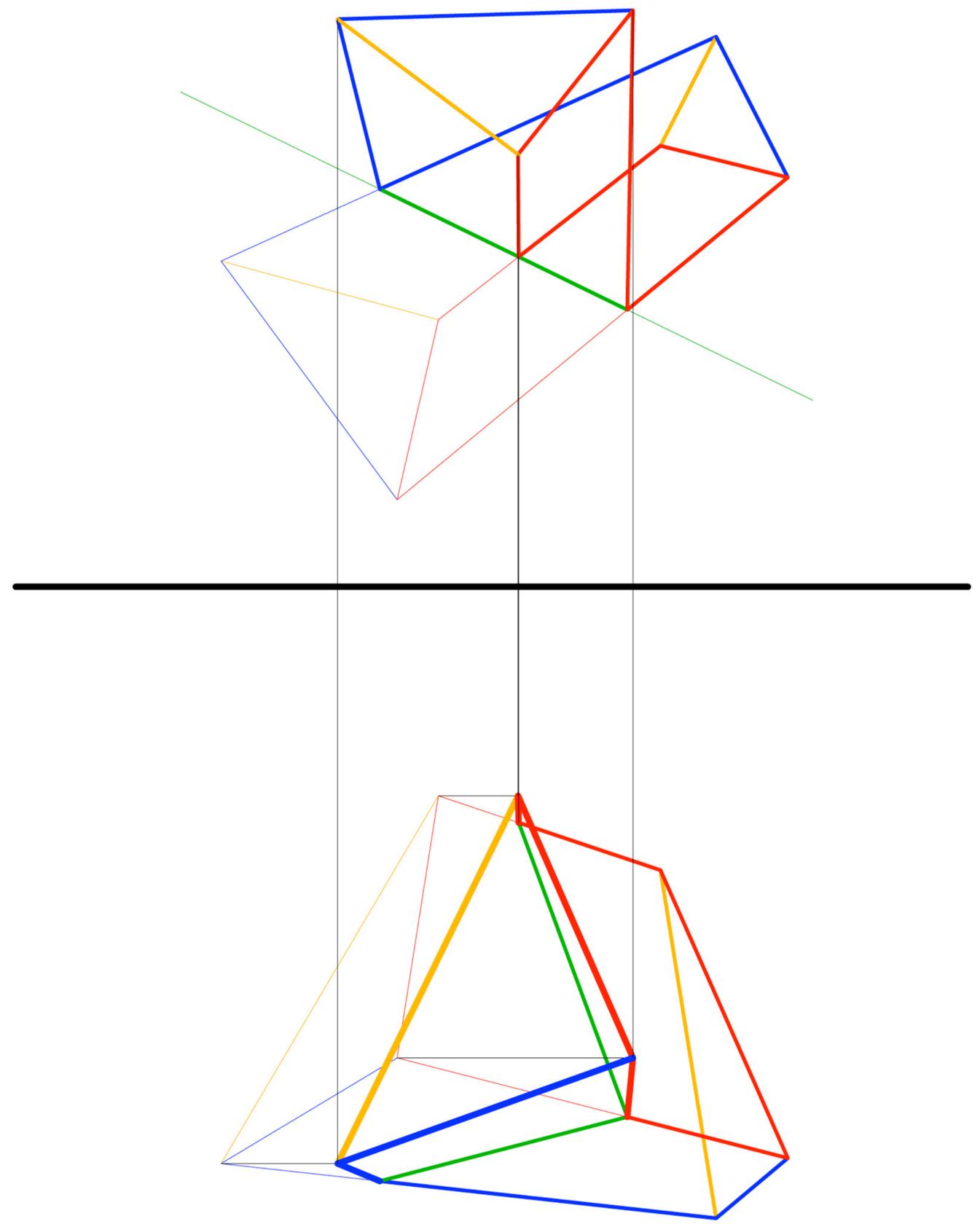
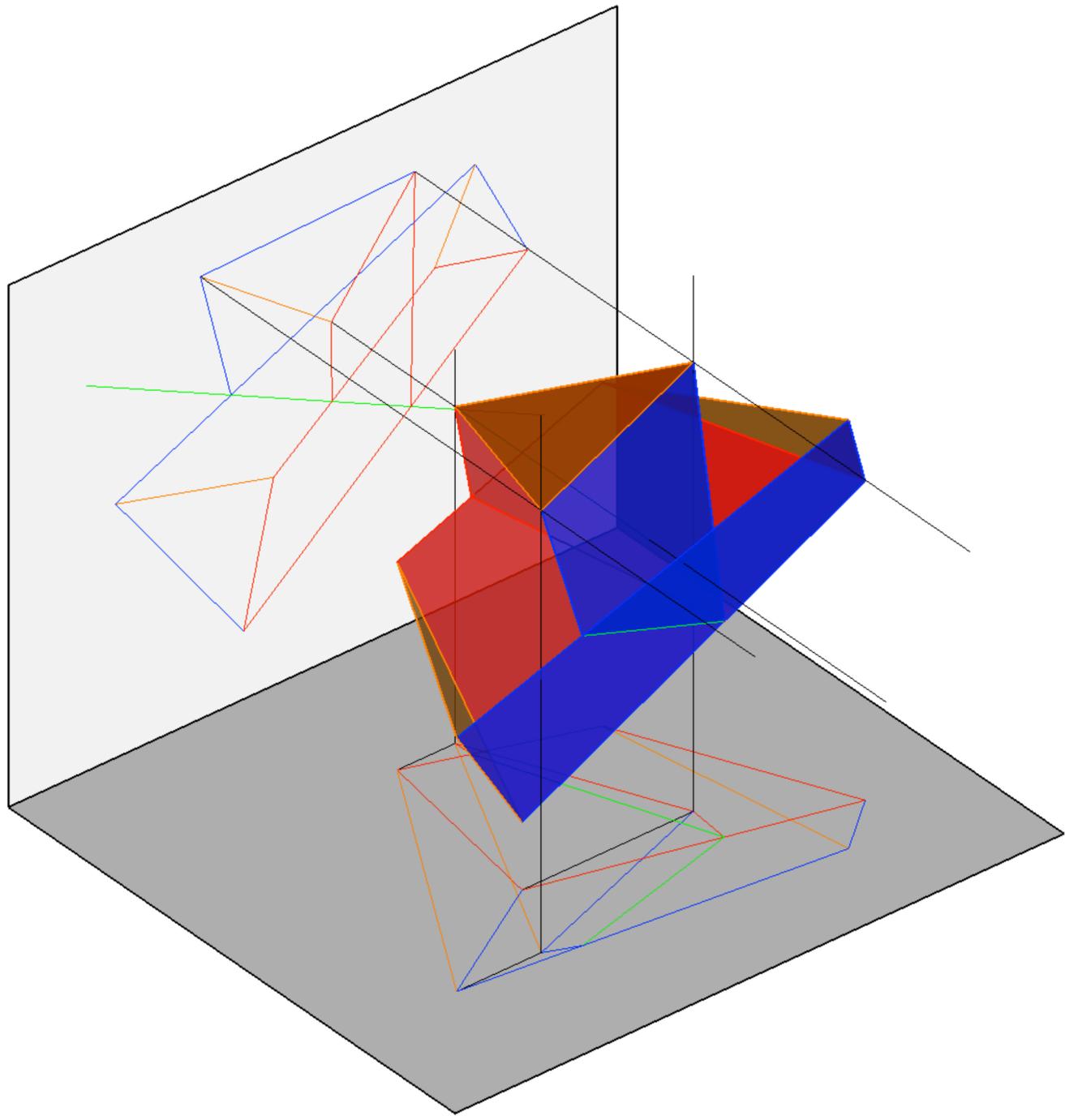
STEP 4: IN THE VERTICAL PROJECTION, REFLECT ALL POINTS AND LINES ACROSS THE INTERSECTION LINE



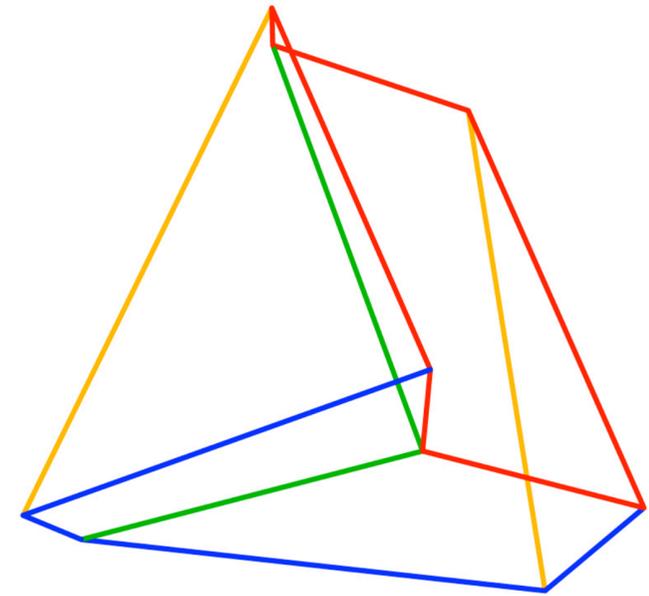
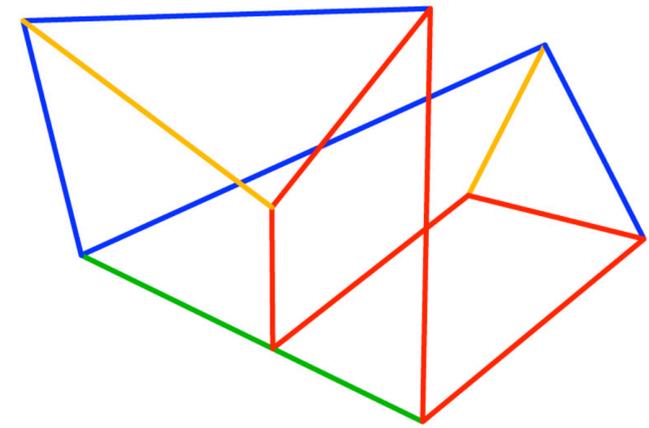
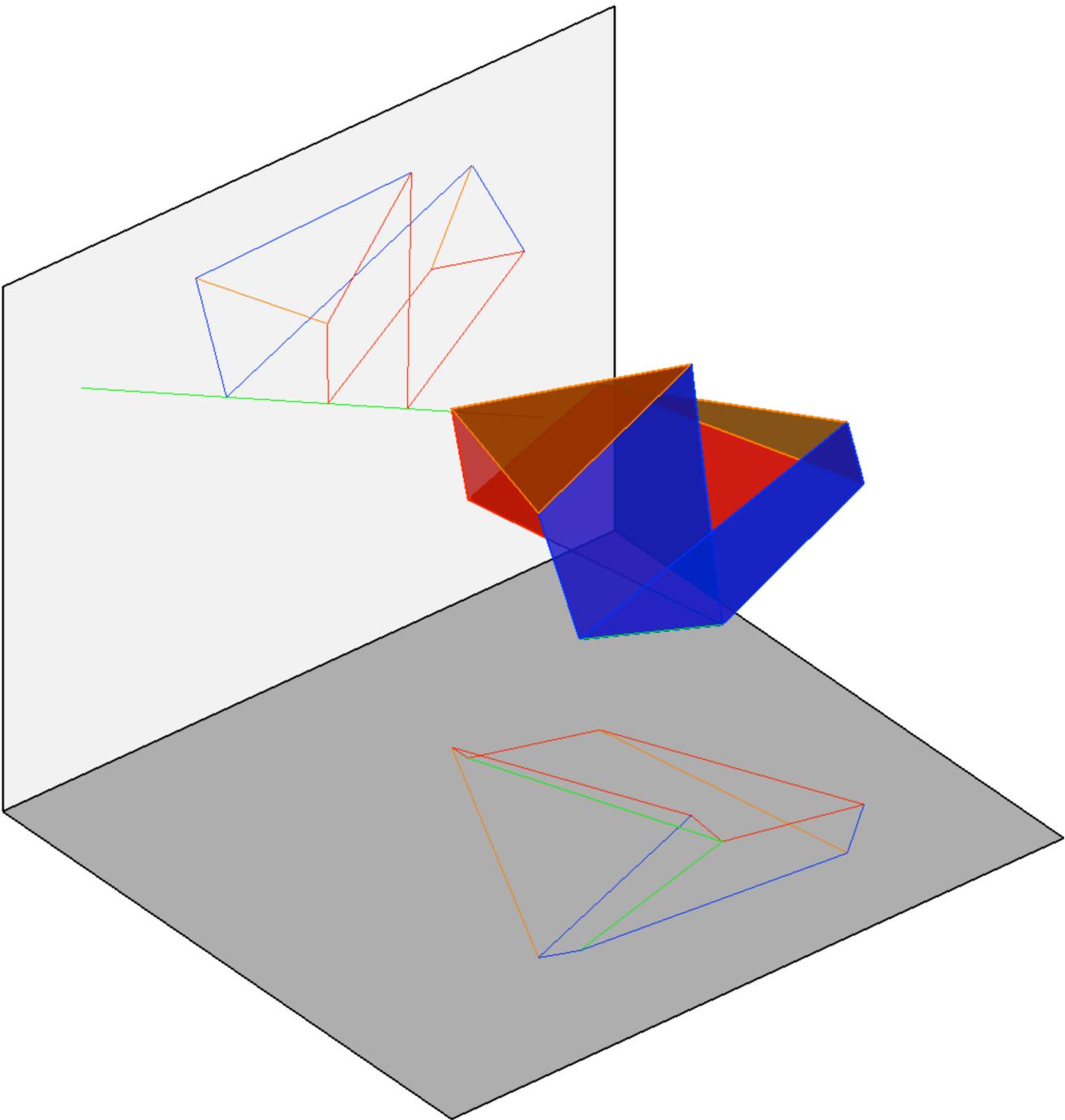
STEP 5: IN THE HORIZONTAL PROJECTION, POINT LOCATIONS RETAIN THEIR DISTANCE FROM THE AXIS



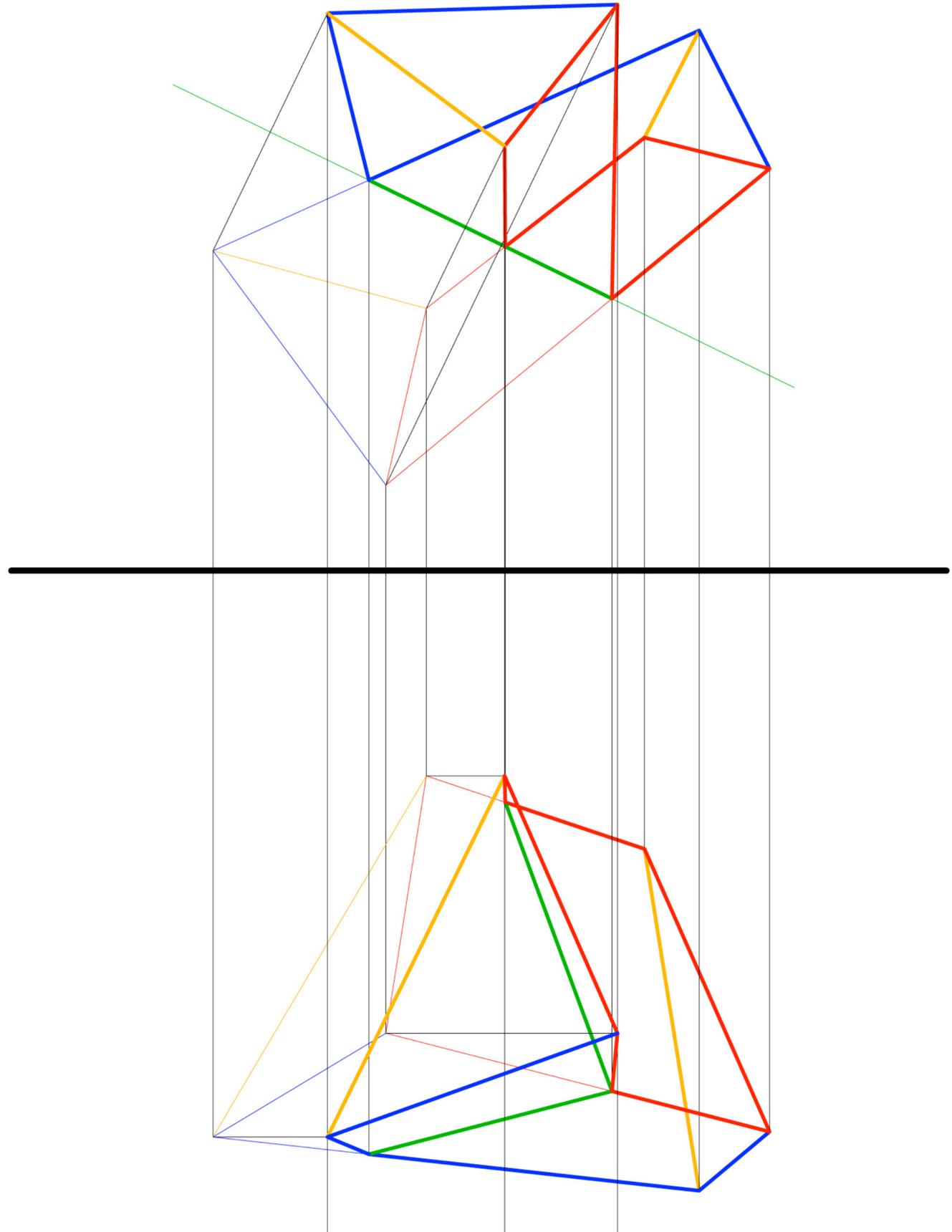
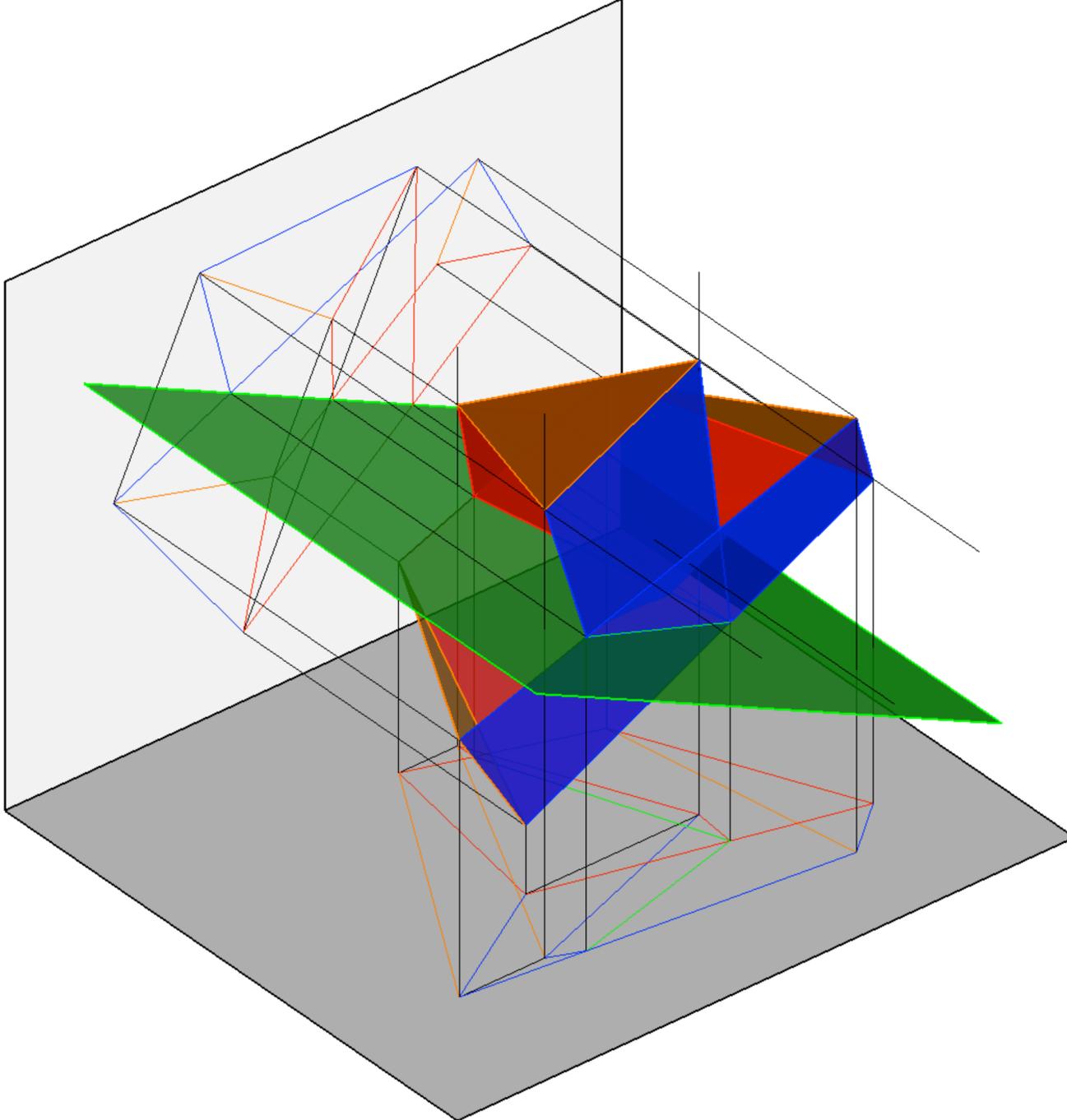
STEP 6: CONNECT THE TRANSLATED POINTS IN THE HORIZONTAL PROJECTION



NOTE: THIS PROCESS ALWAYS PRODUCES A VALID SPATIAL OBJECT, BUT DOES NOT GUARANTEE IT WILL NOT SELF-INTERSECT



FINAL SPATIAL OBJECT AND DRAWING (EXCLUDES DESCRIPTIONS OF TRUE SHAPES)



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