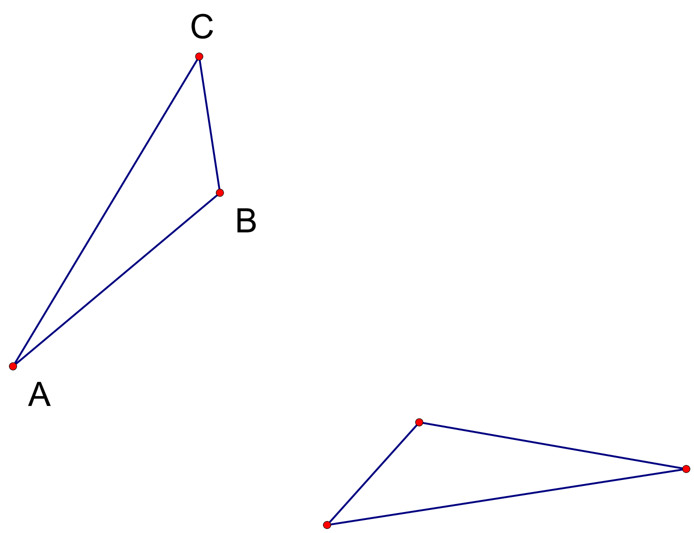
Construction Portfolio #5

37. Center of a Rotation

Construct the center of the rotation that takes triangle ABC to the other triangle (note that this was a problem on Quiz 2 without the information that the isometry is a rotation).



38. Center of a Product of Rotations

Given the points A and B below; let S be rotation with center A by 60 degrees and let T be rotation with center B by 180 degrees.

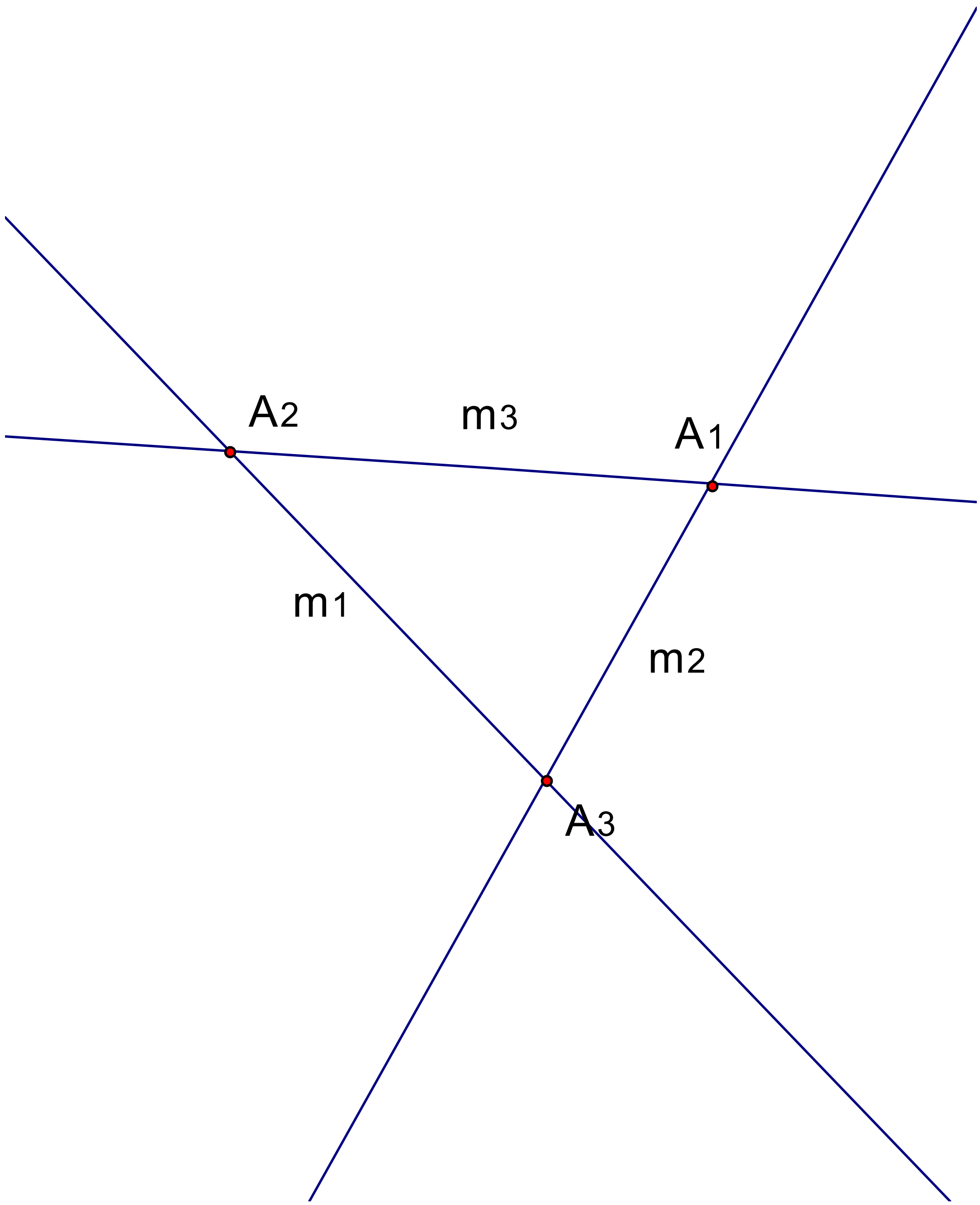
a) Construct the center C of the rotation U = ST. Write down the angle of rotation.

b) Construct the center D of the rotation V = TS. Write down the angle of rotation.

39. Glide Reflection as product of 3 Line Reflections

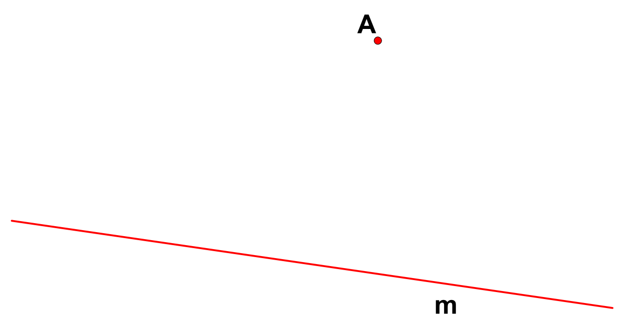
Let M_1, M_2, M_3 be line reflections in the lines m_1, m_2, m_3 below. Let $N = M_1 M_2 M_3$ and let $P = M_3 M_2 M_1$.

a) Construct the invariant (special) line of the glide reflection N and also a glide vector XY.
b) Construct the invariant (special) line of the glide reflection P and also a glide vector UV. Question to Ponder: How are N and P related?



40. Product of a Rotation and a Line Reflection

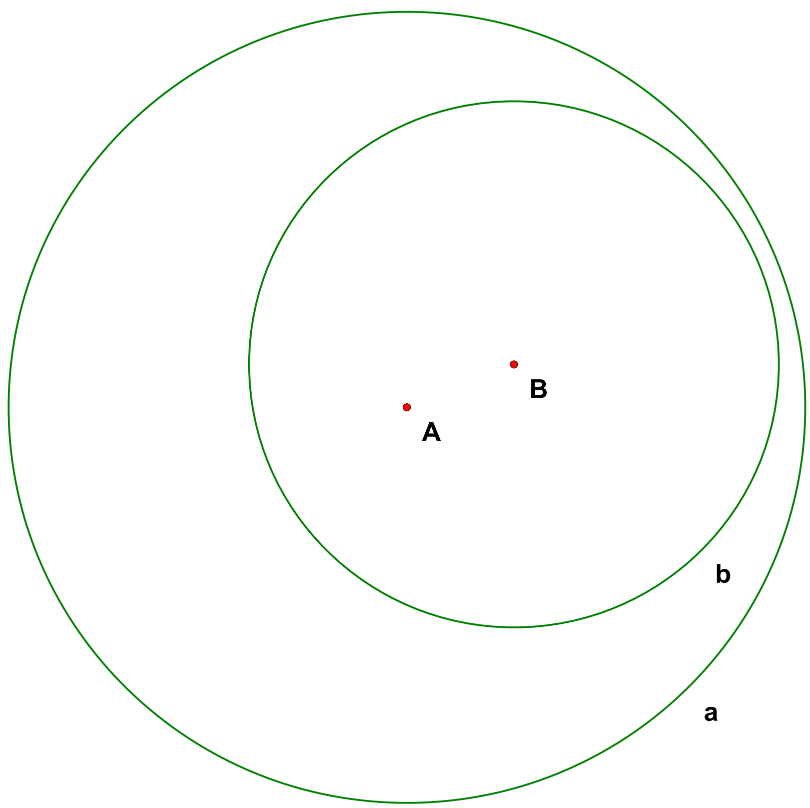
Let E be rotation with center A and angle 90 degrees and let M be reflection in line m. Construct the geometric defining data of ME.



41. Centers of Dilation

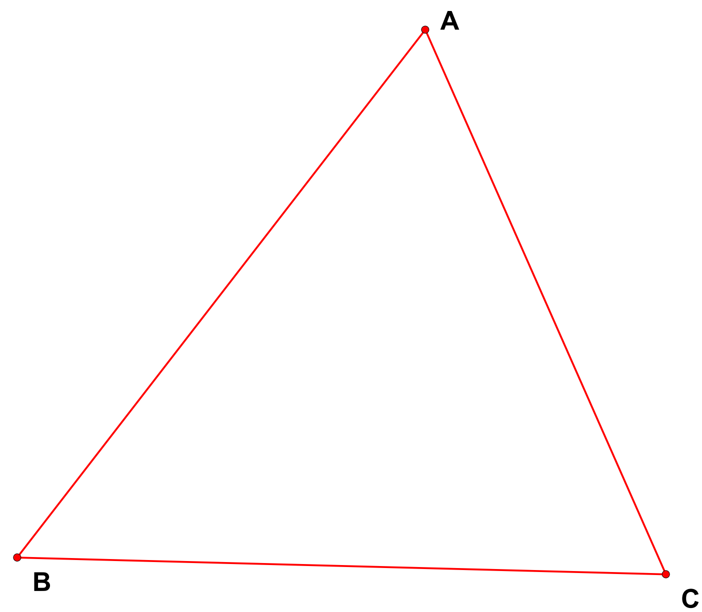
Construct two points P and N so that P is the center of a dilation that takes circle a to circle b with positive ratio and N is the center of a dilation that takes circle a to circle b with negative ratio.

Question to Ponder: The ratio of the radii of a and b is 1.5. How are the distances among the points A, B, P, N related? If AB = d, what are the other distances?



42. Nine-Point Circle and Euler Line

- Construct the Circumcircle of triangle ABC with circumcenter O.
- Construct the Orthocenter H of triangle ABC.
- Construct the Centroid G of triangle ABC.
- Construct the Nine-Point Circle of triangle ABC with center B, with the 9 special points indicated.
- Construct the Euler line of triangle ABC.



43. Image of an Isometry

In the figure are given congruent quadrilaterals ABCD and A'B'C'D'. There is a unique isometry T that takes ABCD to A'B'C'D', i.e., A'B'C'D' is T(ABCD), the image of ABCD.

Construct the quadrilateral A"B"C"D" that is T(A'B'C'D'), the T image of A'B'C'D'.