Triangles ABC and PQR pictured below are congruent:



1. Show the congruence using rigid motions of the plane.
2. Can the congruence be shown with a single translation, rotation, or reflection? Explain.
3. Is it possible to show the congruence using only translations? Explain.
4. Is it possible to show the congruence using only rotations? Explain.
5. Is it possible to show the congruence using only reflections? Explain.

Below is triangle ABC and a rotated image triangle DEF.



1. Explain how to identify the center of rotation.
2. Once you have found the center, how do you find the angle of rotation?

The triangle in the upper left of the figure below has been reflected across a line into the triangle in the lower right of the figure. Use a straightedge and compass to construct the line across which the triangle was reflected.



Below is a picture of a regular octagon, which we denote by O, and two lines denoted ℓ and m, each containing one side of the octagon:



1. Draw rℓ(O), the reflection of the octagon about ℓ.
2. Draw rm(O) and rm(rℓ(O)), the reflections of the two octagons from part (a) about line m.
3. Show that the quadrilateral enclosed by the four octagons O, rℓ(O), rm(O), and rm(rℓ(O)) found in parts (a) and (b) is a square.