

Geometry CC - Unit 4
Lesson 5: Symmetry & Characterize Pts on a \perp Bisector
M1 L15 and M1 L17 **Homework: HW Handout 4.5**
HW Answers 4.4

Oct 20-8:08 AM

SYMMETRY

Type of Symmetry	Example
Line Symmetry A figure has line symmetry if the figure can be mapped onto itself by a reflection in a line . (Think of a mirror image)	
Point Symmetry A figure has point symmetry if the figure is mapped onto itself by rotating the figure 180° about a center point . (This means it looks the same upside down)	
Rotational Symmetry A figure has rotational symmetry if the figure is mapped onto itself by rotating the figure less than 360° about a center point . (Think of a pinwheel)	

Oct 20-8:08 AM

Directions: Determine if the figures have line, point, and/or rotational symmetry. Check all that apply.

1. <input checked="" type="checkbox"/> Line <input checked="" type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input type="checkbox"/> None	2. <input checked="" type="checkbox"/> Line <input type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input type="checkbox"/> None
3. <input type="checkbox"/> Line <input checked="" type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input type="checkbox"/> None	4. <input type="checkbox"/> Line <input type="checkbox"/> Point <input type="checkbox"/> Rotational <input checked="" type="checkbox"/> None
5. <input checked="" type="checkbox"/> Line <input type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input type="checkbox"/> None	6. <input type="checkbox"/> Line <input checked="" type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input type="checkbox"/> None
7. <input checked="" type="checkbox"/> Line <input type="checkbox"/> Point <input type="checkbox"/> Rotational <input type="checkbox"/> None	8. <input type="checkbox"/> Line <input type="checkbox"/> Point <input checked="" type="checkbox"/> Rotational <input checked="" type="checkbox"/> None

Oct 20-8:09 AM

Characterize Points on a Perpendicular Bisector

Example 1: Is it possible to find or construct a line of reflection that is NOT a perpendicular bisector of a segment connecting a point on the pre-image to its image? Try to locate a line of reflection between the two figures at the right without constructing any perpendicular bisectors.

Impossible!

Construct the line of reflection.

For a line l in the plane, a reflection across l is the transformation r_l of the plane defined as follows:

- For any point P on the line l , $r_l(P) = P$, and
- For any point P not on l , $r_l(P)$ is the point Q so that l is the perpendicular bisector of the segment PQ .

Oct 20-8:10 AM

Example 2: Find the center of rotation in the transformation below. How are perpendicular bisectors a major part in finding the center of rotation? Why are they essential?

Perpendicular bisectors play an important role in reflections. In previous lessons, we found that the intersection of the perpendicular bisectors of two segments connecting pairs of pre-image to image points determined the center of rotation.

Oct 20-8:25 AM

Practice: Use the following directions for number 1 and 2. In each pre-image/image combination below (a) identify the type of transformation, (b) state whether perpendicular bisectors play a role in constructing the transformation and, if so, what role; and (c) cite an illustration of the distance-preserving characteristic of the transformation (e.g., identify two congruent segments from the pre-image to the image). For the last requirement, you will have to label vertices on the pre-image and image.

1)	<table border="1"> <thead> <tr> <th>Transformation</th> <th>Perpendicular bisectors?</th> <th>Examples of distance preservation</th> </tr> </thead> <tbody> <tr> <td>Rotation</td> <td>yes</td> <td>$\overline{AB} \cong \overline{A'B'}$ $\overline{BC} \cong \overline{B'C'}$</td> </tr> </tbody> </table> <p>2\perp bisector to find center of rotation</p>	Transformation	Perpendicular bisectors?	Examples of distance preservation	Rotation	yes	$\overline{AB} \cong \overline{A'B'}$ $\overline{BC} \cong \overline{B'C'}$
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Oct 20-8:25 AM