

3.8

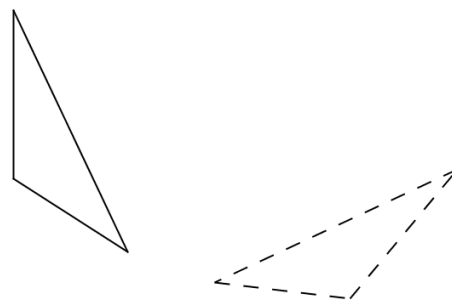
Name (print first and last) _____ Per _____ Date: 10/23 due 10/24

3.8 Rigid Transformations: Perpendicular Lines

Geometry Regents 2013-2014 Ms. Lomac

SLO: I can articulate the invariant qualities of reflections, rotations and translations and explain relationships involving perpendicular bisectors.

- (1) ☐ The triangles at right are a preimage and its image after reflection. Is it possible to draw the line of reflection such that it is NOT the perpendicular bisector of the segments connecting the preimage points to their image points?




- (2) ☐ Get out the Geometry Assumptions page from lesson 3.1 and the rigid motions notes page from lesson 3.3.

3.1: **GEOMETRY ASSUMPTIONS**

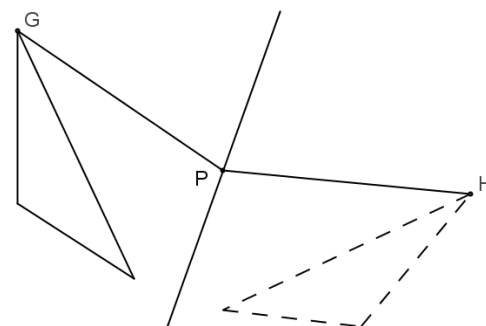
3.3: 

- (a) ☐ Complete "The Power of Circles" on the **GEOMETRY ASSUMPTIONS** page

- (b) ☐ Keep the  page out as you do your work today to use as a reference.

- (3) ☐ The triangles at right are the same as the triangles in #1.

- (a) Is $\overline{GP} \cong \overline{HP}$? Use your  page to justify your claim.

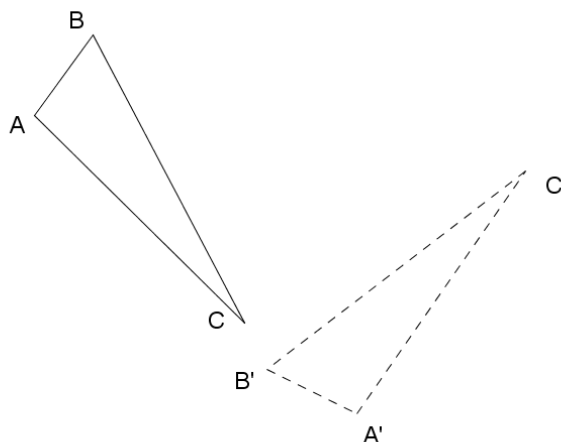


- (4) ☐ To find the center of rotation, you must construct _____ of _____, _____, and/or _____.

- (a) ☐ Construct the center of rotation.

- (b) ☐ $\overline{AA'} \cong \overline{BB'}$ True/False because _____

- (c) ☐ $\overline{AB} \cong \overline{A'B'}$ True/False because _____



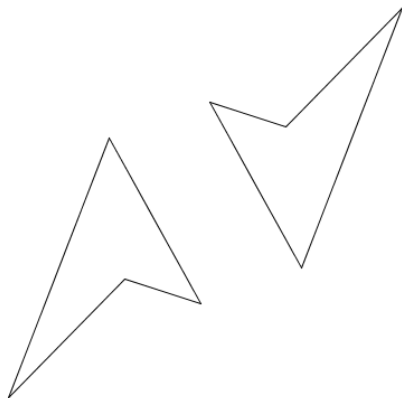
3.8 HW

Name (print first and last) _____ Per _____ Date: 10/23 due 10/24
3.8 Rigid Transformations: Perpendicular Lines **Geometry Regents 2013-2014 Ms. Lomac**

☐ For each preimage-image pair:

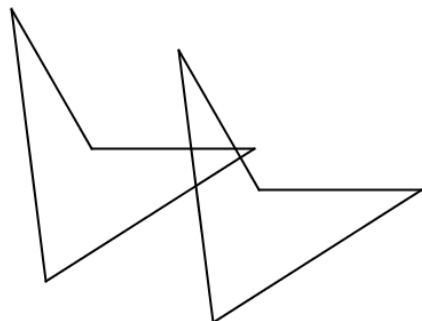
- (1) ☐ Label the preimage (left shape) vertices with letters and the image (right shape) with corresponding prime letters.
 (2) ☐ Identify the type of transformation ☐ (3) List all segments for which perpendicular bisectors aid the construction
 (4) ☐ List all pairs of congruent segments that illustrate preservation of distance.

(a)



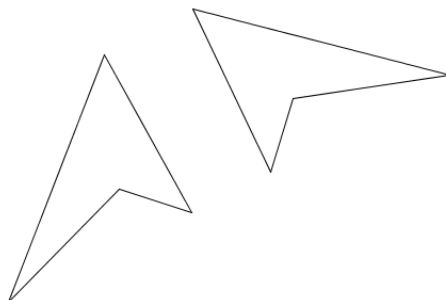
Type of Transformation	Segments for which perpendicular bisectors play a role in the transformation.	Congruent segments that illustrate preservation of distance

(b)



Type of Transformation	Segments for which perpendicular bisectors play a role in the transformation.	Congruent segments that illustrate preservation of distance

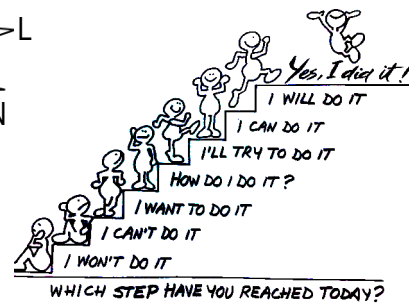
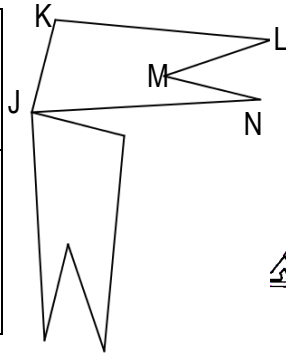
(c)



Type of Transformation	Segments for which perpendicular bisectors play a role in the transformation.	Congruent segments that illustrate preservation of distance

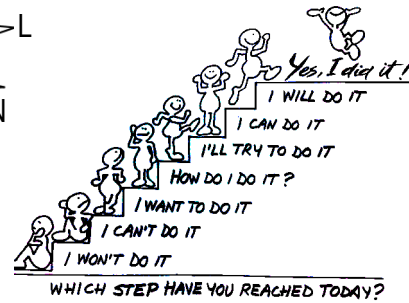
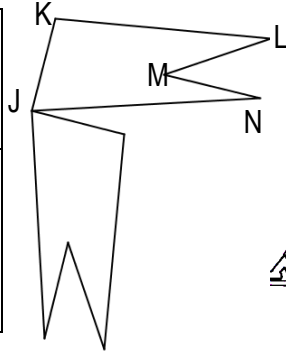
The preimage is labeled. Label the image points and complete the chart.

Type of Transformation	Segments for which perpendicular bisectors play a role in the transformation.	Congruent segments that illustrate preservation of distance



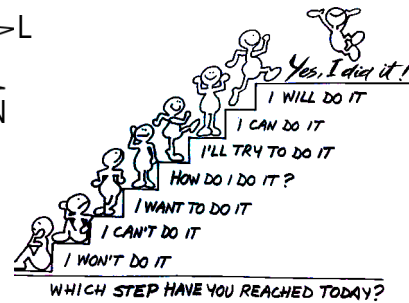
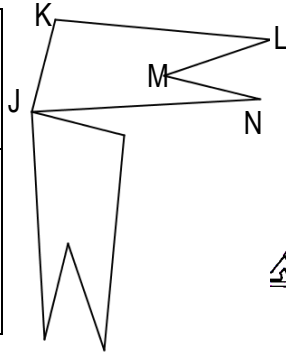
The preimage is labeled. Label the image points and complete the chart.

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Concept/Term

Notes

**Rigid Motion
(Transformation)**

A transformation of the plane is a function that assigns to each point of the plane a unique point in the plane. Transformations that preserve lengths of segments and measures of angles are called _____. A dilation is an example of a transformation that preserves _____ measures but not the lengths of segments. In this lesson, we will work only with rigid transformations. We call a figure that is about to undergo a transformation the _____ while the figure that has undergone the transformation is called the _____.

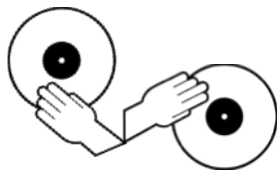
Reflection

_____ are **invariant transformation functions** of the plane such that:

- (a) Any point P on the line of the reflection maps to itself ($P' = P$)
- (b) Any point P not on the line of reflection maps to Q such that the line of reflection is the

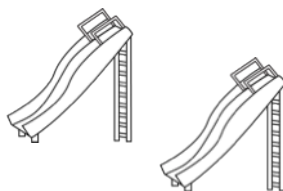
_____ of PQ .

Notation: $r_{x\text{-axis}}$ means reflect across the x -axis.

Rotation

_____ are **invariant transformation functions** of the plane around a center point C such that:

- (a) The center of rotation, point C , maps to itself ($C' = C$)
- (b) Any point P not on the center of rotation maps to a point Q on circle C with radius CP such that $m\angle PCQ$ is equal to the degree of the rotation. {which includes direction --clockwise (negative) or counterclockwise (positive)} Notation: R_{90° means rotate 90° clockwise around the origin on a coordinate grid.

Translation

_____ are **invariant transformation functions** of the plane along a path with distance and direction such that any point (x, y) on the plane maps to $(x + a, y + b)$ where (a, b) describes the path of translation.. $T_{(3,-1)}$ means translate a figure right 3 units and down 1 unit.

GEOMETRY ASSUMPTIONS

01 Line →

2 distinct points determine exactly 1 line.

02 Plane Separation →

Given a line contained in the plane, the points of the plane that do not lie on the line form two sets called half planes such that:

- (a) If 2 points are in one half plane, the segment between them is on the half plane
 - (b) If point P is in one half plane and Q in the other, then PQ intersects the edge of the half plane.
-

03 Distance →

For every pair of points A and B, there is a corresponding distance from A to B.

04 Ruler →

Every line has a coordinate system.

05 Plane →

3 noncollinear points determine exactly 1 plane.

06 Basic Rigid Motions →

- (a) map preimages to images (points to points, lines to lines, line segments to line segments, and rays to rays).
- (b) preserve measurements (distance, angles).

07 Protractor →

- (a) For every angle ($\angle AOE$) there is a corresponding measure of rotation ($m\angle AOE$)
- (b) Let \overrightarrow{OE} be a ray on the edge of the half-plane H. For every angle measure r such that r is between 0° and 180° there is exactly one ray \overrightarrow{OE} with E in the half plane H such that $m\angle AOE$ equals the measure r .

NOTE: In this course, reference to any angle with 3 letters will refer to angles with measures greater than zero and less than or equal to 180° unless otherwise specified.

Angle Addition →

- (c) If C is a point in the interior of $\angle AOE$ then $m\angle AOC + m\angle COE = m\angle AOE$.
- (d) If two angles form a linear pair, then they are supplementary.

08 Parallel Postulate →

Given a line and a point not on the line, there is at most one line that passes through the point that is parallel to the given line.

The Power of Circles →

- (a) _____

- (b) _____

