

NAME _____

DATE _____

PERIOD _____

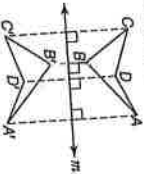
9-1

Study Guide and Intervention

Reflections

Draw Reflections The transformation called a reflection is a flip of a figure in a point, a line, or a plane. The new figure is the image and the original figure is the preimage. The preimage and image are congruent, so a reflection is a congruence transformation or isometry.

Example 1 Construct the image of quadrilateral $ABCD$ under a reflection in line m .



Draw a perpendicular from each vertex of the quadrilateral to m . Find vertices A' , B' , C' , and D' that are the same distance from m on the other side of m . The image is $A'B'C'D'$.

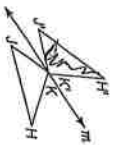
In Example 2, the notation $(a, b) \rightarrow (a, -b)$ represents a reflection in the x -axis. Here are three other common reflections in the coordinate plane.

- in the y -axis: $(a, b) \rightarrow (-a, b)$
- in the line $y = x$: $(a, b) \rightarrow (b, a)$
- in the origin: $(a, b) \rightarrow (-a, -b)$

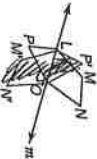
Exercises

Draw the image of each figure under a reflection in line m .

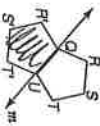
1.



2.

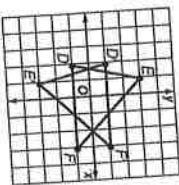


3.

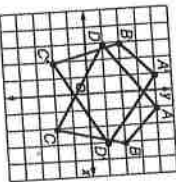


Graph each figure and its image under the given reflection.

4. $\triangle DEF$ with $D(-2, -1)$, $E(-1, 3)$, $F(3, -1)$ in the x -axis



5. $ABCD$ with $A(1, 4)$, $B(3, 2)$, $C(2, -2)$, $D(-3, 1)$ in the y -axis



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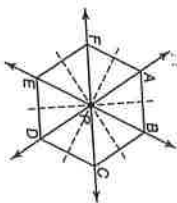
Study Guide and Intervention (continued)

Reflections

Lines and Points of Symmetry If a figure has a line of symmetry, then it can be folded along that line so that the two halves match. If a figure has a point of symmetry, it is the midpoint of all segments between the preimage and image points.

Example Determine how many lines of symmetry a regular hexagon has. Then determine whether a regular hexagon has point symmetry.

There are six lines of symmetry, three that are perpendicular through opposite vertices and three that are perpendicular bisectors of opposite sides. The hexagon has point symmetry because any line through P identifies two points on the hexagon that can be considered images of each other.



Exercises

Determine how many lines of symmetry each figure has. Then determine whether the figure has point symmetry.

1.



4; yes

2.



3; no

3.



2; yes

4.



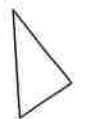
5; no

5.



2; yes

6.



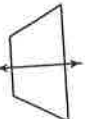
0; no

7.



1; no

8.



1; no

9.



1; no

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