Big Ideas Ch 4 Notes

Geometry

Name ____

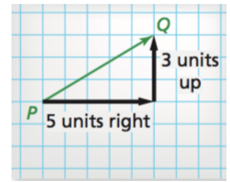
Date ______________________________ Period __________

Chapter 4 Transformations

Ch 4.1 Translations

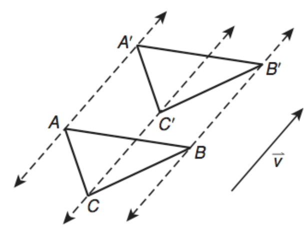
Vocabulary

Transformation: ____



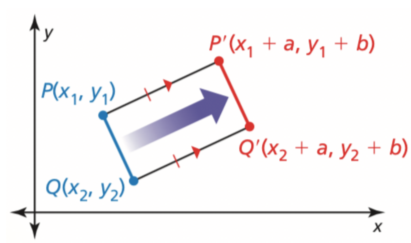
Vector: ____

Translation: ____



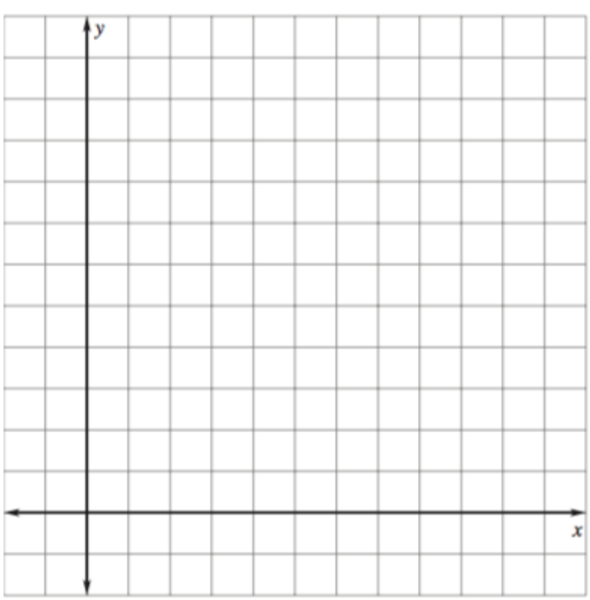
Isometry: ____

Definition of Translation:



Graph:

The vertices of ΔABC are A(0, 3), B(2, 4), and C(1, 0). Translate ΔABC using vector <5, -1>.



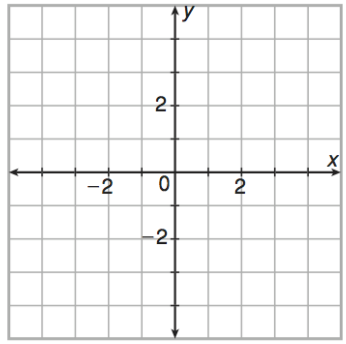
Translation Vector

<u>Component Form</u>	<u>Translation Rule</u>
< 4, 3 >	
< -3.2, 5.9 >	
< t - 1, $2t^2$ >	

Graph:

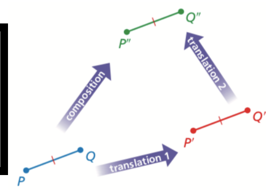
Pre-image: A(1, -2), B(1, 0), C(3, 1), D(4, -3)

Rule: (x, y) -> (x-5, y+3)



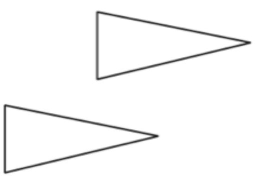
Composition of Transformations: ____

Composition Theorem	

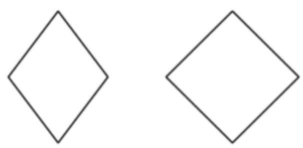


Is this a translation? Why or why not?

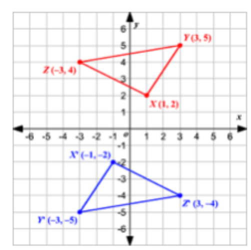
A)



B)



C)



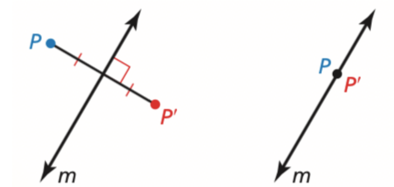
Ch 4.2 Reflections

Vocabulary

Reflection: ____

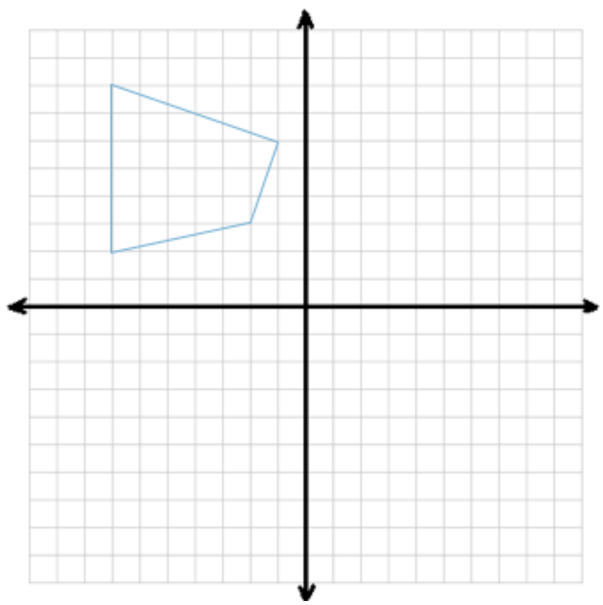
Line of Reflection: ____

Definition of Reflection:

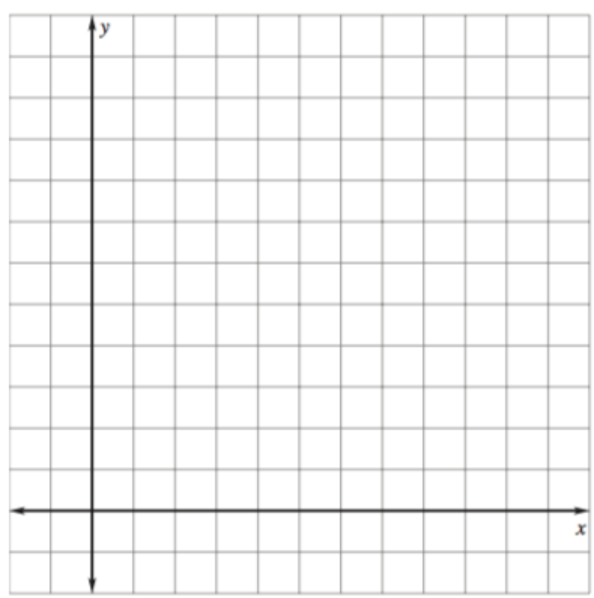


point *P* not on *m*   point *P* on *m*

Graph:
Reflect the pre-image about the:
a) x-axis
b) y-axis

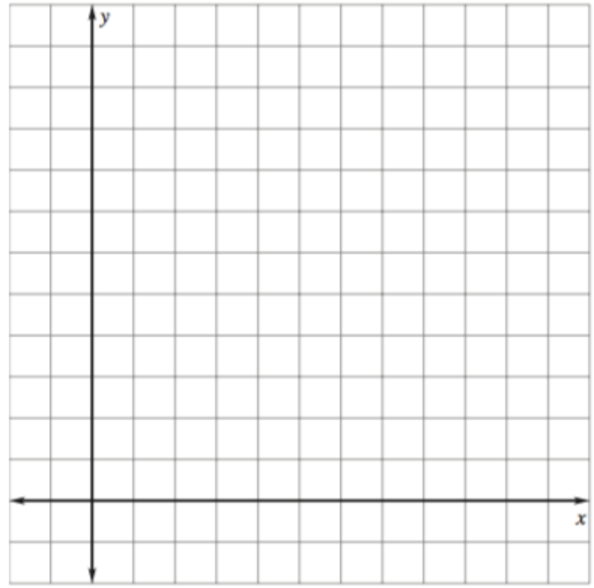


Graph:
Pre-image: A(1, 3), B(5, 2), C(2, 1)
Reflect about the line:
(a) x = 5
(b) y = 4



Challenge:
make a rule for (a)

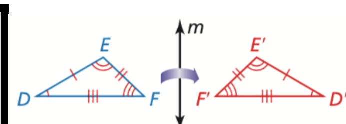
Graph:
Pre-image: A(1, 3), B(5, 2), C(2, 1)
Reflect about the line: y = x



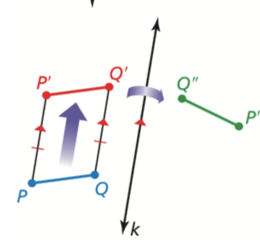
Rules of Reflection

Line of Reflection	Rule
across the x-axis	
across the y-axis	
across the line y = x	
across the line y = -x	

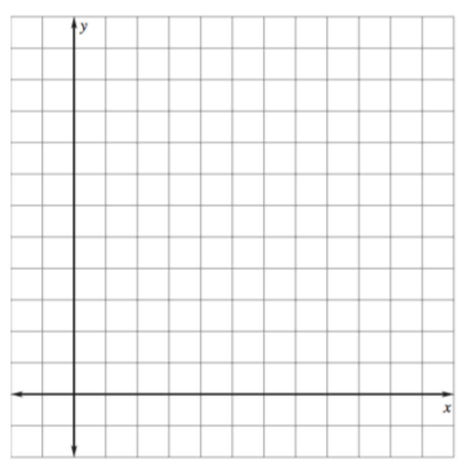
Reflection Postulate	



Glide Reflection: ____



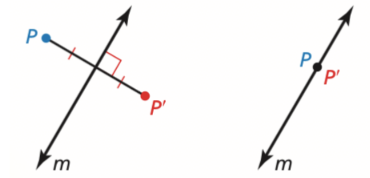
Graph:
Pre-image: A(1, 3), B(5, 2), C(2, 1)
Perform a glide reflection using:
Translation (x, y) -> (x+5, y-1)
Reflect around x = 3



Vocabulary

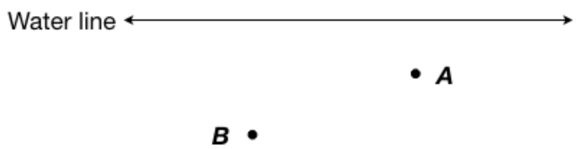
Line Symmetry: ____

Line of Symmetry: ____



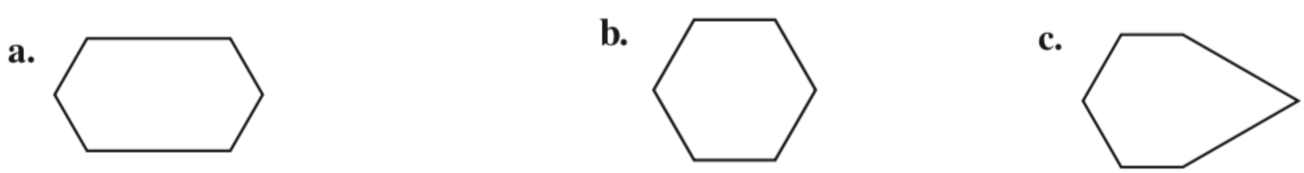
point P not on m point P on m

Problem Solving - Water line

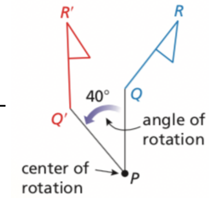


Lines of Symmetry

How many lines of symmetry does each figure have?



Ch 4.3 Rotations



Rotation: ____

Definition of Rotation:

Is this a rotation?

A)

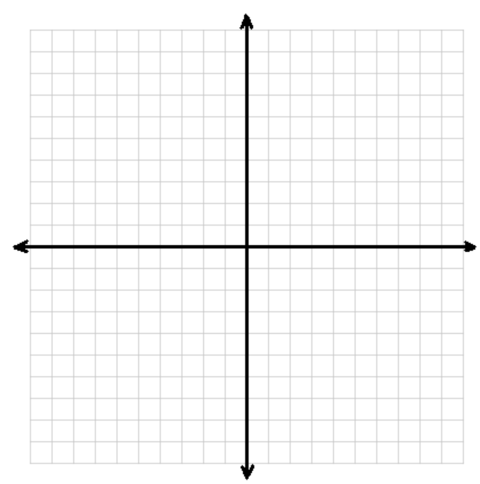
B)

C)

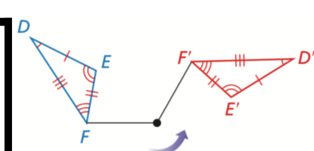
Rules of Rotation

Rotation about the origin	Rule
rotation of 90˚	
rotation of 180˚	
rotation of 270˚	

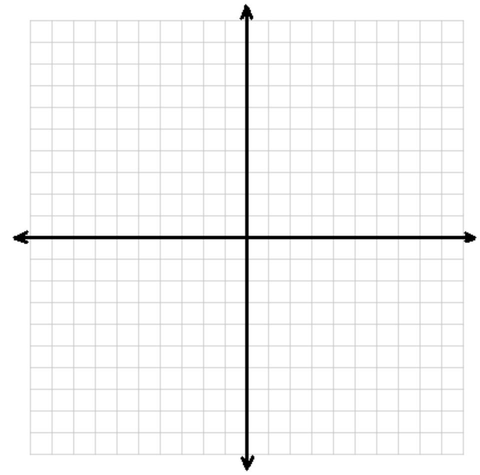
Graph:
Pre-image: R(3, 1), S(5, 1), T(5, −3), U(2, −1)
Graph the image rotated 270˚ about the origin.



Rotation Postulate	



Graph composite:
segment R(1, −3), S(2, −6)
Reflection: around the y-axis
Rotation: 90˚ about the origin

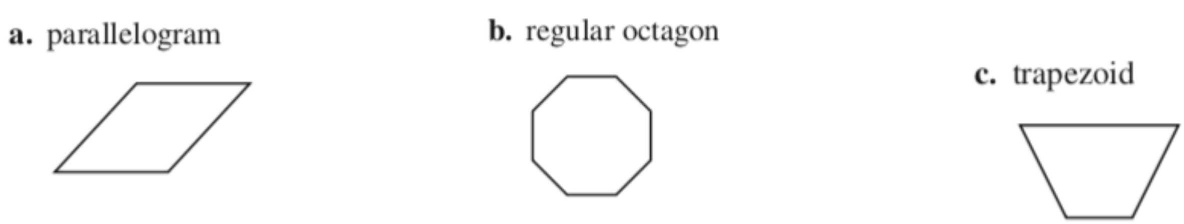


Vocabulary

Rotational Symmetry: ____

Center of Symmetry: ____

Does each figure have rotational symmetry?



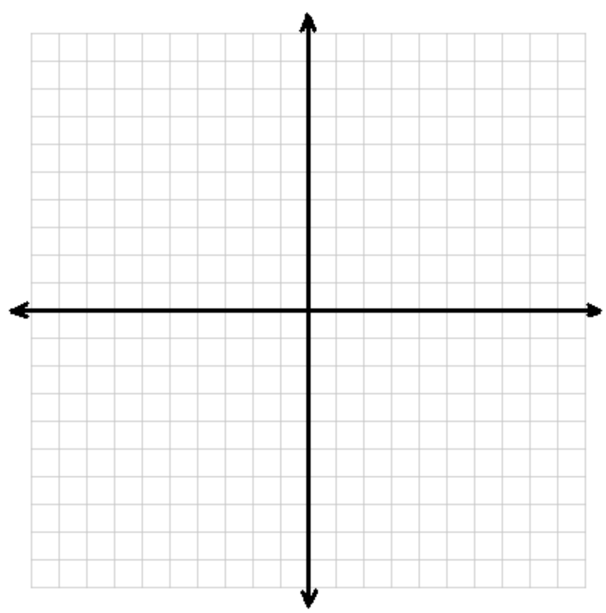
Application - London Eye

Observation wheel radius = _________________

One rotation takes ________________ minutes

If car starts at ________________________, what is car's location after

__________ minutes?



Ch 4.4 Congruence and Transformations

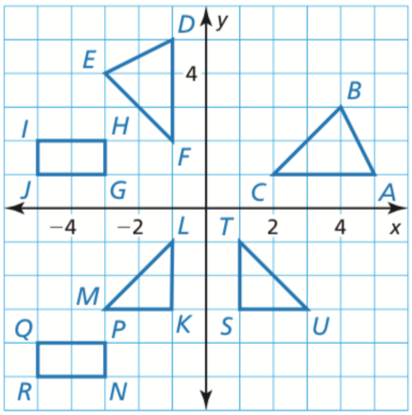
Vocabulary

Congruent Figures: ____

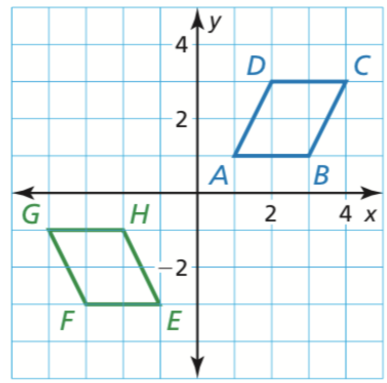
Congruence Transformation: ____

Solve:

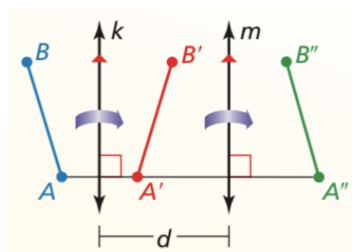
Identify congruent figures in the diagram, and determine the rigid motions (isometries) that were used.



Describe a congruence transformation that maps ▱ABCD to ▱EFGH.



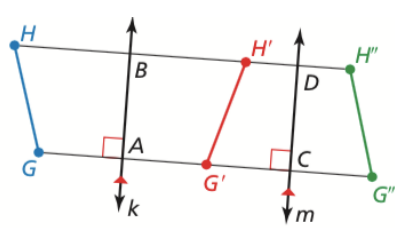
Reflections in Parallel Lines Theorem	



Solve:

In the diagram, a reflection in line k maps GH to G'H'. A reflection in line m maps G'H' to G''H''. Also, HB = 9 and DH'' = 4.

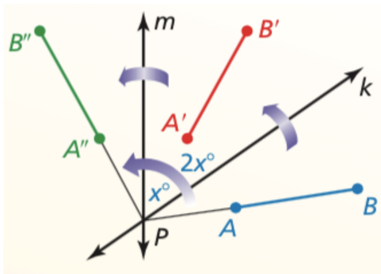
a. Name any segments congruent to: GH, HB, and GA.



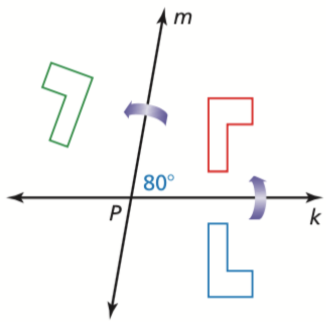
b. Does AC = BD?

c. What is the length of GG''?

Reflections in Intersecting Lines Theorem	

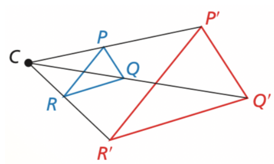


Solve:
In the diagram, the pre-image is reflected in line k, then in line m. Describe a single transformation that maps the blue figure onto the green figure.



Ch 4.5 Dilations

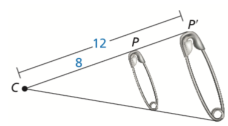
Vocabulary



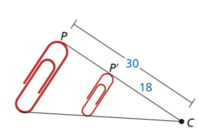
Dilation: ____

Dilation is/is not a rigid motion. Why?

Definition of Dilation:

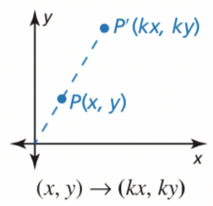


Scale Factor:
When scale factor ____________________, the dilation is an ______________________________ .



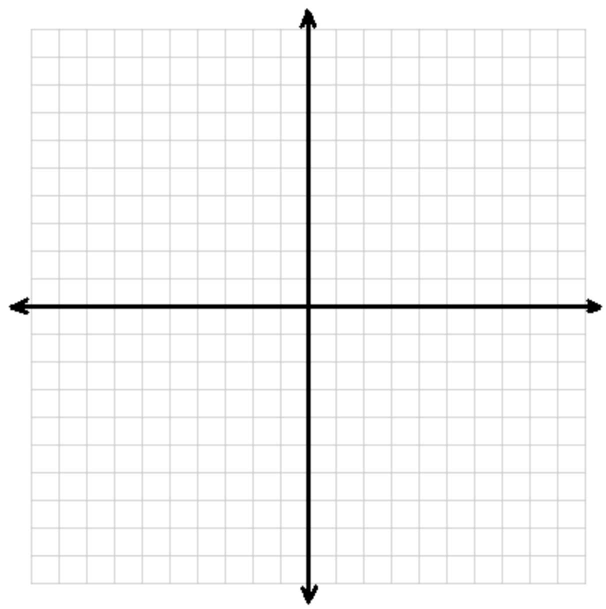
When scale factor ____________________, the dilation is a ______________________________ .

Rule of Dilation:



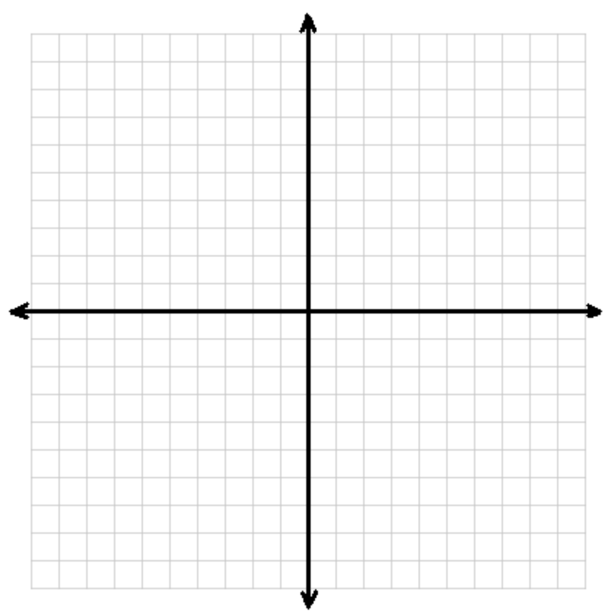
Graph the dilation:
Pre-image is K(−3, 6), L(0, 6), M(3, 3), and N(−3, −3).

Scale factor $k = \frac{1}{3}$



Graph the dilation:
Pre-image is F(−4, −2), G(−2, 4), and H(−2, −2)

Scale factor $k = -\frac{1}{2}$



Problem solving:
You are using a magnifying glass that shows the image of an object that is ____________________ times the object's actual size. Determine the length of the image of the spider seen through the magnifying glass.

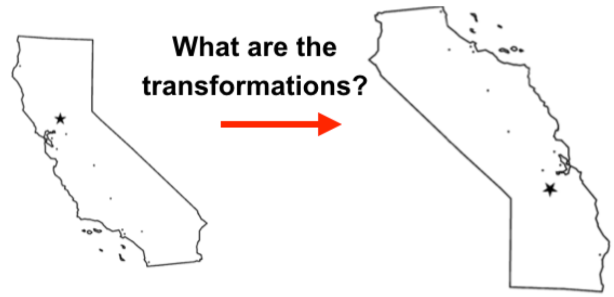
Ch 4.6 Similarity and Transformations

Vocabulary

Similar Geometries: ____

Similarity Transformation: ____

Definition of Similar Figures:

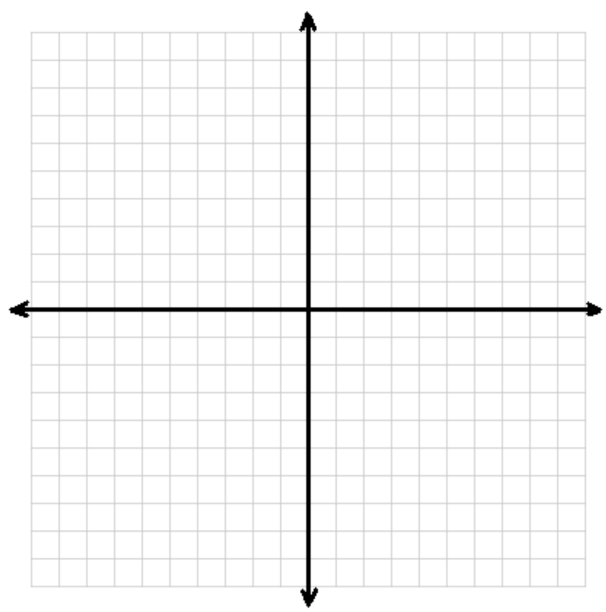


Perform a Similarity Transformation

Graph △ABC with vertices A(−4, 1), B(−2, 2), and C(−2, 1) and its image after the similarity transformation.

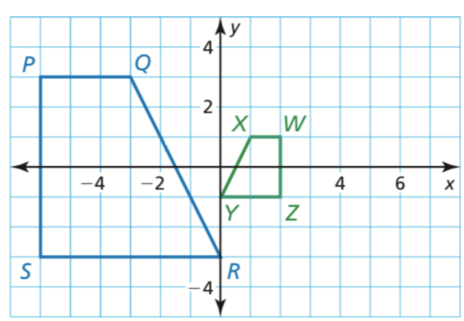
Translation: (x, y) → (x + 5, y + 1)

Dilation: (x, y) → (2x, 2y)



Describe a Similarity Transformation

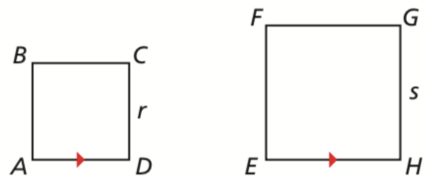
Describe transformation(s) that maps trapezoid PQRS to trapezoid WXYZ.



Prove two squares are similar

Given Square $ABCD$ with side length r, square $EFGH$ with side length s, $\overline{AD} \parallel \overline{EH}$

Prove Square $ABCD$ is similar to square $EFGH$.



<u>Statements</u>	<u>Reasons</u>