Geometry

4.1 Translations

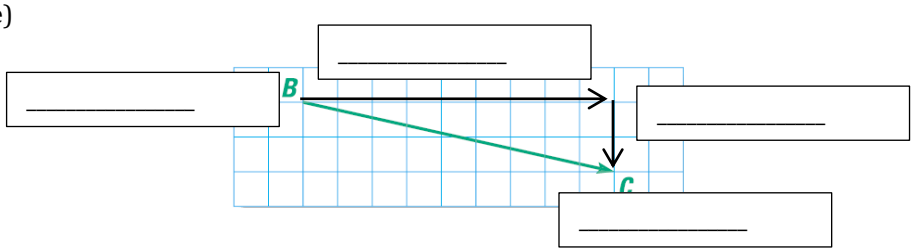
Vector ($\overrightarrow{BC}$)

Measurement with _____ and _____ (size)

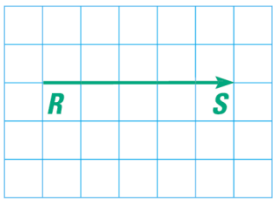
Represented by an _____

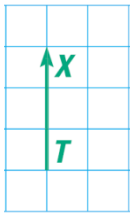
Component form ⟨_____, _____⟩

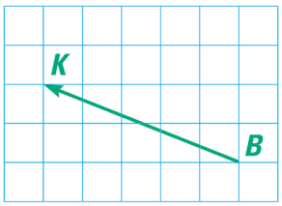
$\overrightarrow{BC}$ = ⟨_____, _____⟩



Name the vector and write its component form







Transformation

_____ or _____ a figure

Original called _____ (i.e. ΔABC)

New called _____ (i.e. $\Delta A'B'C'$)

Translation

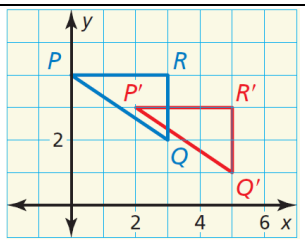
_____ every point the same _____ in the same _____

(x, y) → _____

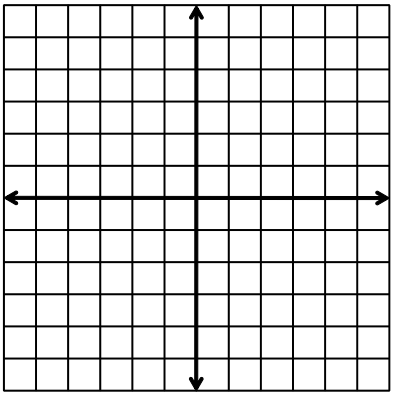
Where _____ is the translation _____

The vertices of ΔLMN are L(2, 2), M(5, 3), N(9, 1). Translate ΔLMN using vector ⟨−2,6⟩.

Write a rule for the translation of ΔPQR to $\Delta P'Q'R'$.



Draw ΔRST with vertices $R(2, 2)$, $S(5, 2)$, and $T(3, -2)$. Find the image of each vertex after the translation $(x, y) \rightarrow (x + 1, y + 2)$. Graph the image using prime notation.



Rigid Motion

Transformation that preserves _____ and _____ _____.

A _____ transformation

Translation Theorem

A translation is a _____.

Composition of Transformations

- _____ or _____ transformations _____ into a _____ transformation

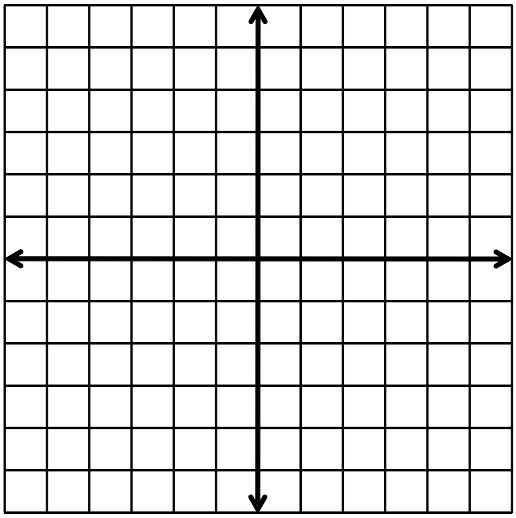
Composition Theorem

A composition of two (or more) _____ is a _____.

Graph $\overline{RS}$ with endpoints $R(-8, 5)$ and $S(-6, 8)$. Graph its image after the composition.

Translation: $(x, y) \rightarrow (x - 1, y + 4)$

Translation: $(x, y) \rightarrow (x + 4, y - 6)$

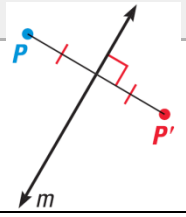


Assignment: 172 #2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 32, 42, 43, 44, 48, 52 = 20

Geometry

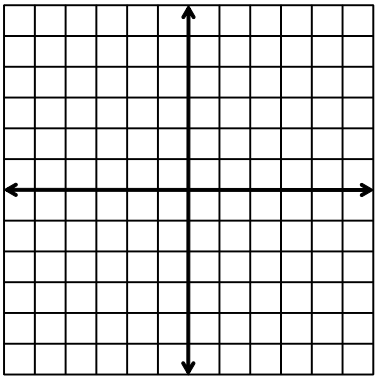
4.2 Reflections

Reflection



- Transformation that uses a line like a _____ to _____ an _____.
- That line is called _____
- P and P' are the same _____ from the ____ of _____
- The line connecting P and P' is _____ to the line of _____

Graph a reflection of ΔABC where $A(1, 3)$, $B(5, 2)$, and $C(2, 1)$ in the line $x = 2$.



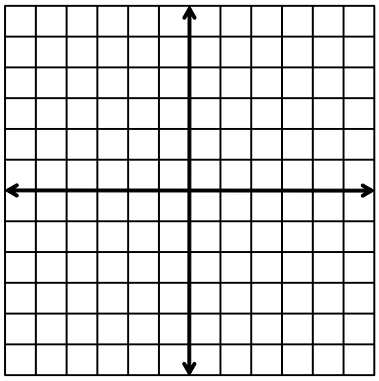
Coordinate Rules for Reflections

- Reflected in x-axis: (a, b) → _____
- Reflected in y-axis: (a, b) → _____
- Reflected in $y = x$: (a, b) → _____
- Reflected in $y = -x$: (a, b) → _____

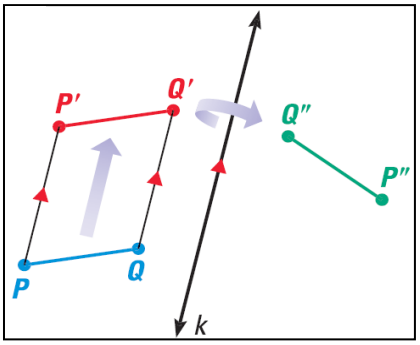
Reflection Theorem

A reflection is a _____.

Graph ΔABC with vertices $A(1, 3)$, $B(4, 4)$, and $C(3, 1)$. Reflect ΔABC in the lines $y = -x$ and $y = x$.



The vertices of ΔLMN are L(-3, 3), M(1, 2), and N(-2, 1). Find the reflection of ΔLMN in the y-axis.



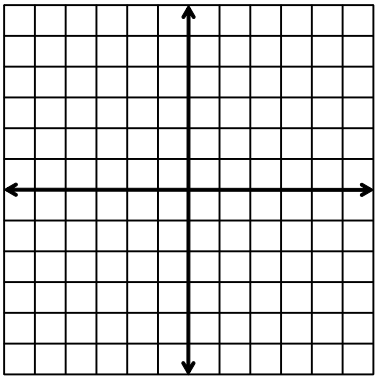
Glide Reflection

- _____ followed by _____ over a line _____ to the translation

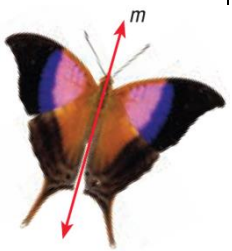
The vertices of ΔABC are $A(3, 2)$, $B(-1, 3)$, and $C(1, 1)$. Find the image of ΔABC after the glide reflection.

Translation: $(x, y) \rightarrow (x, y - 4)$

Reflection: Over y-axis



Line symmetry



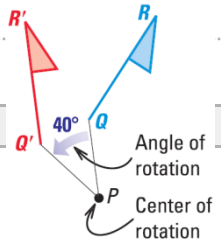
- The figure can be _____ to _____ by a _____
- The line of reflection is called _____
- _____ tend to _____ that symmetry is _____

How many lines of symmetry does the object appear to have?

Assignment: 180 #2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 45, 49, 51, 54, 55 = 20

Geometry

4.3 Perform Rotations



Rotation

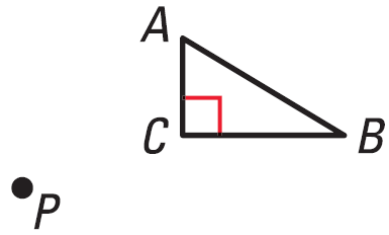
- Figure is _____ about a _____ called _____
- The amount of _____ is _____

Rotation Theorem

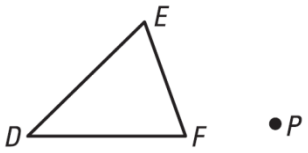
A rotation is a _____.

Draw a rotation of ΔABC about P.

1. Draw a segment from A to P.
2. Draw a ray to form a 120° angle with $\overline{PA}$
3. Draw A' so that $PA' = PA$
4. Repeat steps 1-3 for each vertex. Draw $\Delta A'B'C'$.



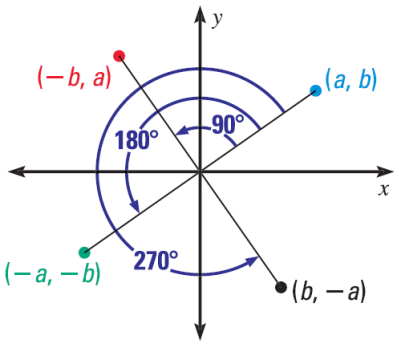
Draw a 50° counterclockwise rotation of ΔDEF about P.



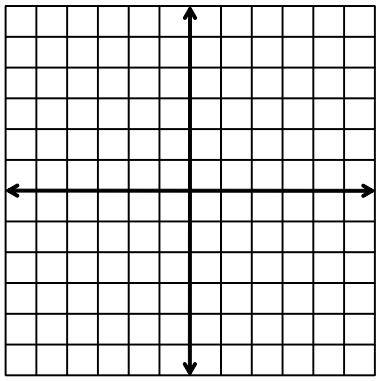
Geometry 4.3 Name: _____

Coordinate Rules for Counterclockwise Rotations about the Origin

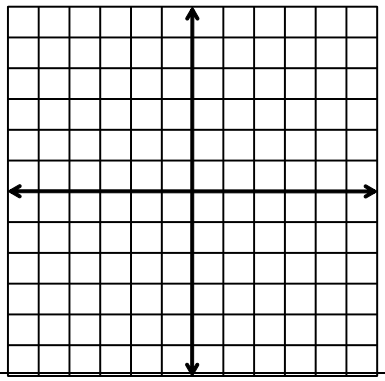
- 90°: (a, b) → _____
- 180°: (a, b) → _____
- 270°: (a, b) → _____



If E(-3, 2), F(-3, 4), G(1, 4), and H(2, 2). Find the image matrix for a 270° rotation about the origin.

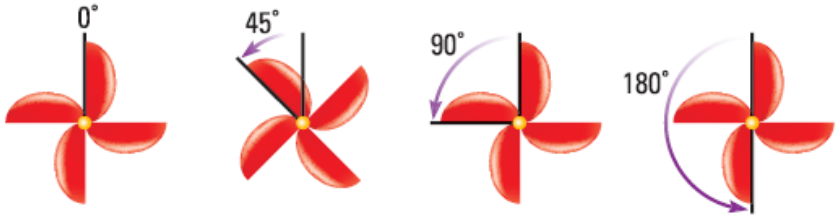


Graph $\overline{RS}$ with endpoints $R(1, -3)$ and $S(2, -6)$ and its image after the composition.
Rotation: 180° about the origin
Reflection: in the y-axis

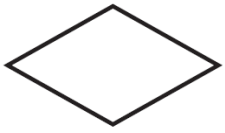


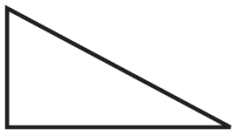
Rotational Symmetry

- The figure can be _____ to itself by a _____ of _____ or _____ about the _____ of the figure
- The center of rotation is called the _____



Does the figure have rotational symmetry? What angles?





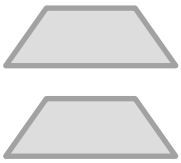
Assignment: 188 #2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 40, 42, 43, 46, 47 = 20

Geometry

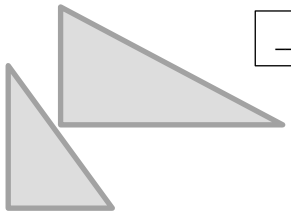
4.4 Congruence and Transformations

Congruent (≅)

Exactly the same _____ and _____.

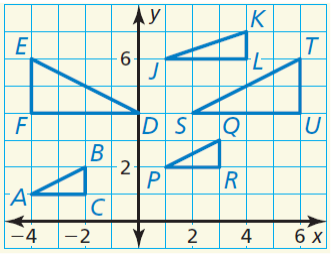


_____



_____

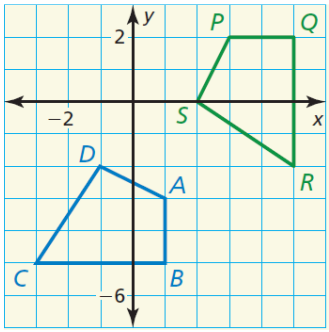
Identify any congruent figures in the coordinate plane. Explain.



Congruence Transformation

- Transformation with _____
- _____ ≅ _____

Describe a congruence transformation that maps quadrilateral *ABCD* to quadrilateral *PQRS*.



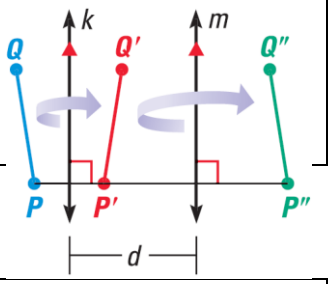
Reflections in Parallel Lines Theorem

If lines k and m are _____, then a _____ in _____ followed by a reflection in _____ is the same as a _____.

If P'' is the image of P, then

$\overline{PP''}$ is _____ to k and m, and

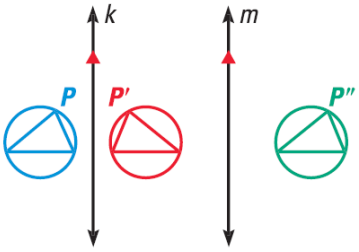
PP'' = _____where d is the _____ between k and m



Use the figure below. The distance between line k and m is 1.6 cm.

1. The preimage is reflected in line k, then in line m. Describe a single transformation that maps the blue figure to the green.

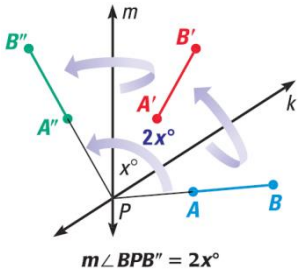
2. What is the distance from P and P''?



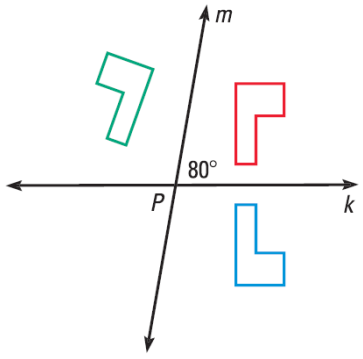
Reflections in Intersecting Lines Theorem

If lines k and m _____ at point P, then a _____ in _____ followed by a reflection in _____ is the same as a _____ about point P.

The _____ is _____, where $x°$ is the measure of the _____ or _____ angle formed k and m.



In the diagram, the preimage is reflected in line k, then in line m. Describe a single transformation that maps the bottom right figure to the top left.



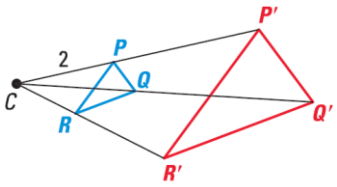
Assignment: 196 #2, 4, 6, 8, 10, 12, 14, 15, 16, 18, 20, 24, 26, 28, 35, 36, 42, 46, 49, 50 = 20

Geometry

4.5 Identify and Perform Dilations

Dilation

- _____ or _____
- Image is _____ to preimage
- _____ is k
  - If $0 < k < 1$, then _____
  - If $k > 1$, then _____
- The image point P' lies on $\overrightarrow{CP}$. The scale factor k is a positive number such that $k = \frac{CP'}{CP}$ and $k \neq 1$

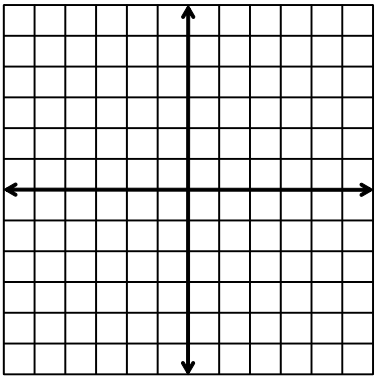


- Scale factor is _____

Coordinate Rule for Dilations

- (x, y) → _____
- Where k is the _____ factor

Graph $\triangle PQR$ with vertices $P(4, 6)$, $Q(-4, 2)$, and $R(2, -6)$ and its image after a dilation with a scale factor of 0.5.



Draw and label ΔRST, then construct a dilation of ΔRST with R as the center of dilation and a scale factor of 3.

1. Draw ΔRST, then draw rays $\overrightarrow{RS}$ and $\overrightarrow{RT}$

2. Using a ruler, measure RS. Multiply by the scale factor. Using the ruler mark this length RS' on $\overrightarrow{RS}$. Repeat for the other rays.

3. Draw ΔR'S'T'

You are using a magnifying glass that shows the image of an object as three times the object's actual size. Determine the actual length of a spider when the image of the spider seen through the magnifying glass is 6.75 centimeters long.

Assignment: 204 #2, 4, 6, 8, 10, 14, 16, 18, 20, 22, 24, 26, 28, 34, 38, 50, 52, 55, 56, 59 = 20

Geometry

4.6 Similarity and Transformations

Similar figures

- Same _____; different _____

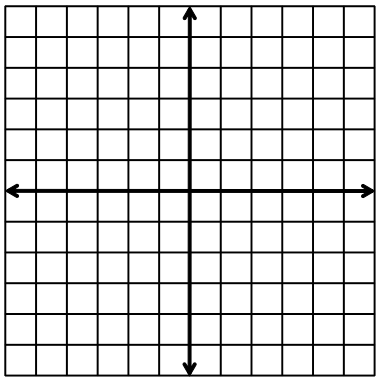
Similarity Transformation

- _____ or
- _____ of _____ and another transformation

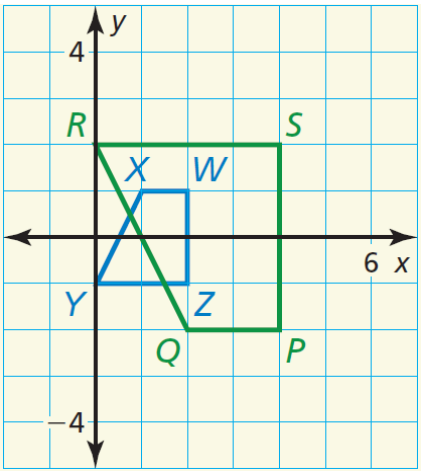
Graph $\triangle ABC$ with vertices $A(12, -6)$, $B(0, -3)$, and $C(3, -9)$ and its image after the similarity transformation.

Reflection: in the y-axis

Dilation: $(x,\ y) \rightarrow \left(\frac{1}{3}x, \frac{1}{3}y\right)$



Describe a similarity transformation that maps trapezoid $WXYZ$ to trapezoid $PQRS$.



Assignment: 211 #2, 4, 6, 8, 10, 13, 14, 16, 17, 19, 21, 22, 23, 24, 28 = 15