

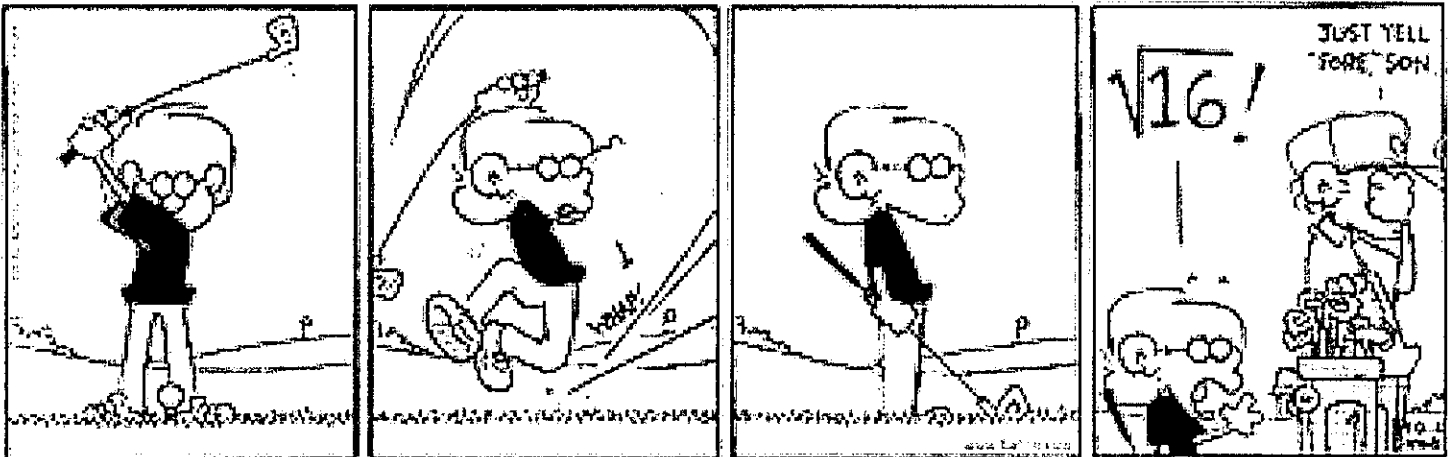
Name: _____

Hour: _____

Unit D:

Transformations

Geometry 1st Semester



Lesson 4-1: Reflecting Points

Vocabulary

Preimage: _____

Transformation: _____

1. Each point of the _____ has a unique _____.

2. Each point of the _____ has a unique _____.

$T(P)$	
$r(A) = A'$	
$r_m(P) = Q$	

Practice

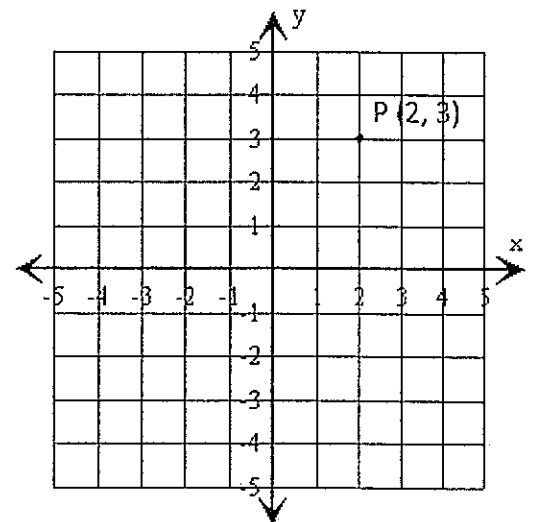
Reflecting points over the x and y -axis:

- Using your MIRA, reflect point P over the x -axis. Label the new point P' . Then, reflect point P over the y -axis. Label the new point P'' .
- What are the coordinates of the new points?

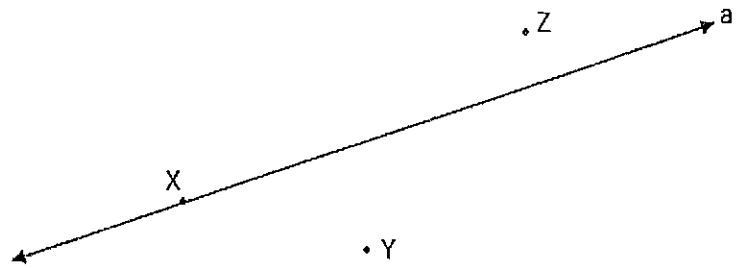
$$P' = (\quad , \quad)$$

$$P'' = (\quad , \quad)$$

What do you notice about the x and y values when you reflect them over a particular axis?



3. a. Draw $r_a(X)$. Label it X' .
 b. Draw $r_a(Y)$. Label it Y' .
 c. Draw $r_a(Z)$. Label it Z' .



4. Draw a line connecting Y to Y' and then a line connecting Z to Z' ...what is the relationship between each line that you drew and line a ?

Lesson 4-2: Reflecting Figures

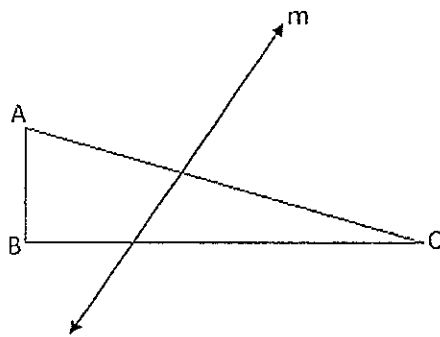
Vocabulary

Reflection Postulate: Under a reflection...

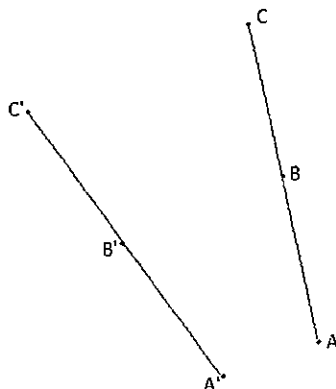
- A. _____ is preserved.
- B. _____ is preserved.
- C. _____ is preserved.
- D. _____ is preserved.
- e. _____ is REVERSED.
- f. There is a _____ between points and their images.

Practice

1. Draw the reflection image $A'B'C'$ of triangle ABC over line m .



2. Draw line x so that $r_x(ABC) = A'B'C'$.

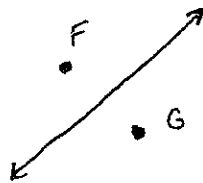


Lesson 6-1: Reflection-Symmetric Figures

Vocabulary

Reflection-Symmetric Figure: _____

Flip-Flop Theorem: _____



Segment Symmetry Theorem: _____

a) _____

b) _____

Angle Symmetry Theorem: _____

Side Switching Theorem: _____

Circle Symmetry Theorem: _____

Example

Symmetric Figures Theorem: _____

Practice

1. Draw all of the lines of symmetry for the letters below.

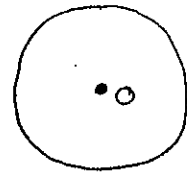
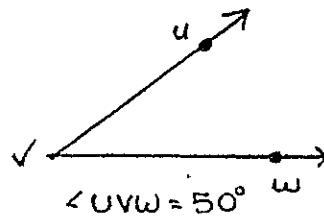
A

C

X

N

2. Draw all of the lines of symmetry for the figures below.



3. For the figure below, complete the following:

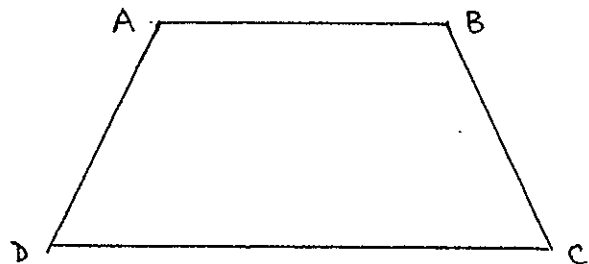
a. Draw the line of symmetry.

b. $\angle A = \angle$ _____

c. $\angle D = \angle$ _____

d. $BC =$ _____

e. $AC =$ _____



Lesson 4-4: Translations

Vocabulary

Composite: _____

Alternative Notations for Compositions:

$$r_m(r_n(\triangle ABC)) = \underline{\hspace{2cm}} \quad \text{OR} \quad r_m \cdot r_n(\triangle ABC) = \underline{\hspace{2cm}}$$

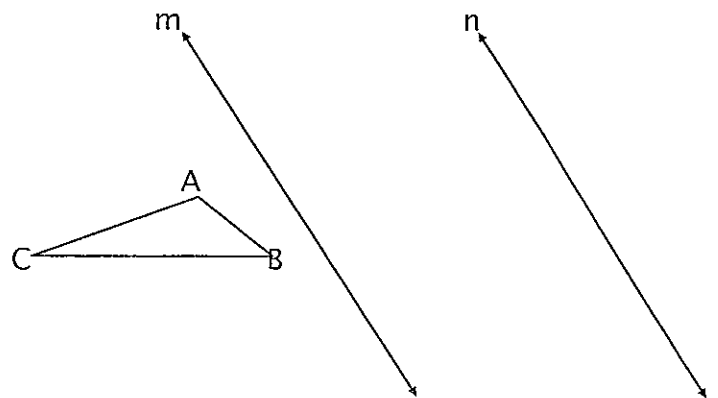
Translation/Slide: _____

Properties of Translations:

1. Preserved: _____

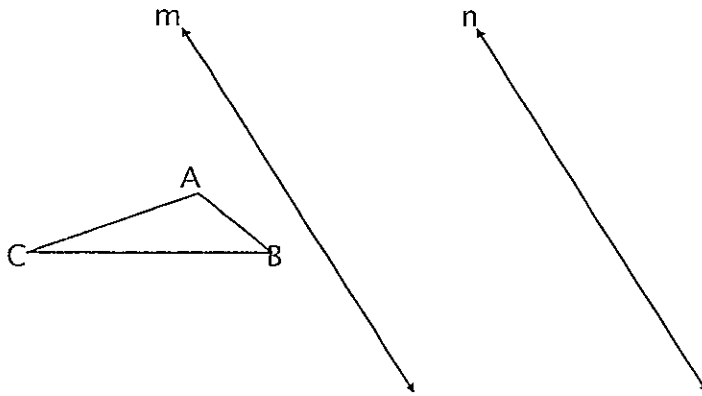
2. Direction is given by any ray from a preimage point through its image point.
3. Magnitude: _____

Two Reflections Theorem: If $m \parallel n$, the translation $r_m \cdot r_n$ has _____



Practice

1. In the figure below, $m \parallel n$. Use the Two Reflection Theorem to draw $r_n \circ r_m(\triangle ABC)$ – so do NOT do each actual reflection, just draw the end result & explain why the new triangle is where it is.



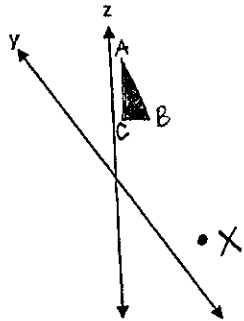
Lesson 4-5: Rotations

Vocabulary

Rotation: _____

Rotations Preserve: _____

Clockwise vs. Counterclockwise:



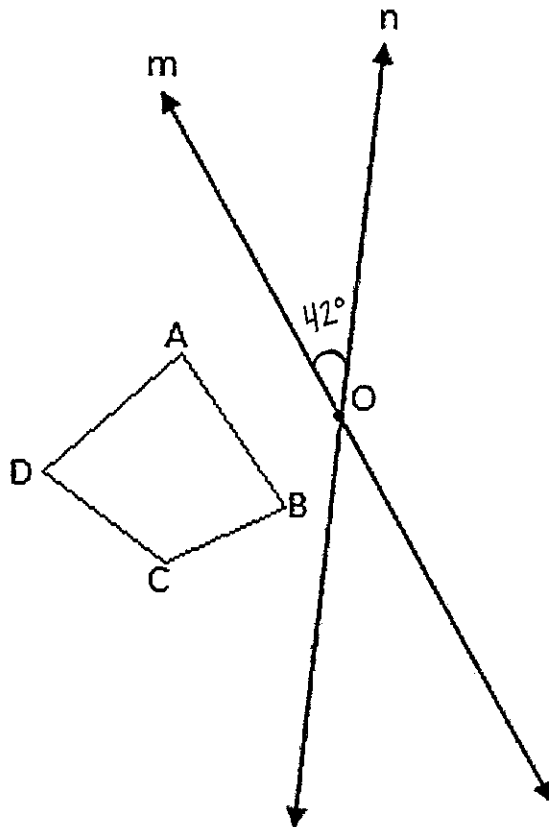
$r_y \circ r_z$ **OR** $r_y(r_z(\triangle ABC))$: _____

$r_z \circ r_y$ **OR** $r_z(r_y(\bullet X))$: _____

Two Reflections Theorem for Rotations: If m intersects n , the rotation $r_m \circ r_n$ has center O , where m intersects n and the magnitude of the rotation is _____

Practice

1. For the image below, reflect $r_m(r_n(ABCD))$.
 - a. Did the figure rotate clockwise or counterclockwise?
 - b. What is the magnitude of the rotation?



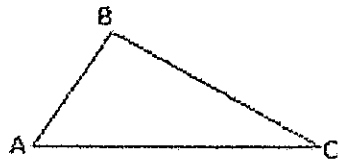
Lesson 4-6: Translations with Vectors

Vocabulary

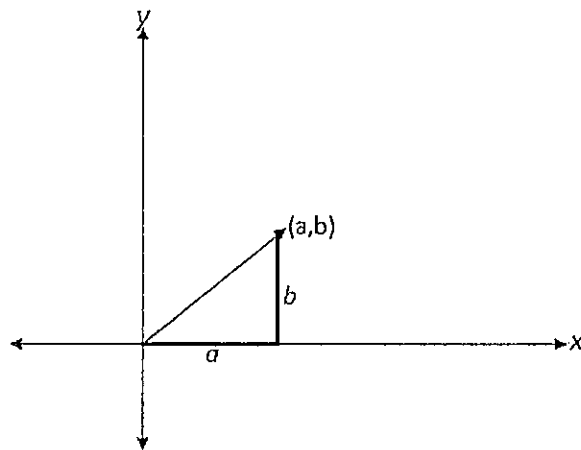
Vector: _____

Practice

1. Draw the vector \overrightarrow{AB} .
2. Draw the image of $\triangle ABC$ under the translation with the given vector .
(Hint: eyeball it!)



Vectors in the Coordinate Plane



For vector (a, b) shown above, a is the horizontal component and b is the vertical component.

Translations Using Vectors

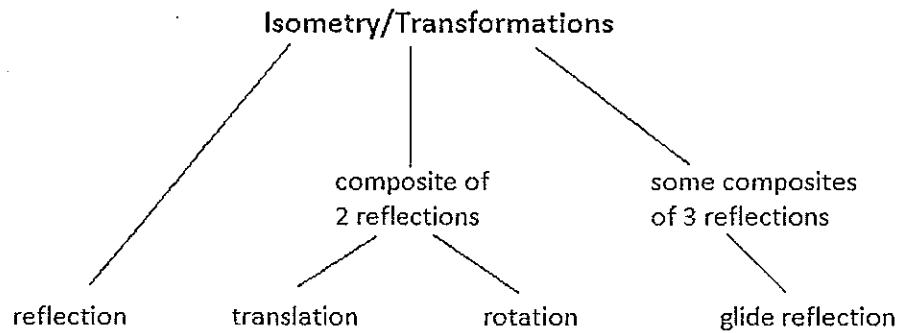
When translating a figure on the coordinate plane by a vector (a, b) , _____

Practice

1. A line segment has endpoints $A = (5, -2)$ and $B = (3, 7)$. Find the points of the image under a translation by vector $(-1, 4)$.

Transformation in a Plane	Determined By	Description in Terms of Reflections
Reflection		r_m
Rotation		$r_m \circ r_n$ if m intersects n
Translation		$r_m \circ r_n$ if $m \parallel n$

Lesson 4-7: Isometries & Glide Reflections



Vocabulary

Isometry: _____

Concurrent: _____

Glide Reflection: a combination of a _____ over a line and a _____ whose direction is parallel to the reflecting line.

Notation

Glide Reflection $G =$ _____, where r_m is a reflection and T is a translation.

Practice

- Given the figure below, let $G = T \circ r_m(ABCD)$, where m is a line and T is the translation given by vector \overrightarrow{XY} . Draw $G(ABCD)$.

