

Transformations

MATCH Game

STANDARD: TEKS 8.10(C): Explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90, 180, 270, and 360 degrees as applied to two-dimensional shapes on a coordinate plane using an algebraic representation.

PLAYERS: 2-4, **BEST PLAYED WITH PARTNERS**

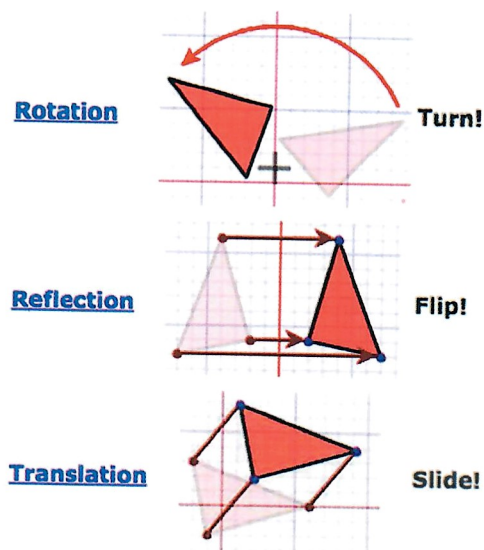
MATERIALS: 1 set of match cards
Answer Key
Recording Sheet
Passport

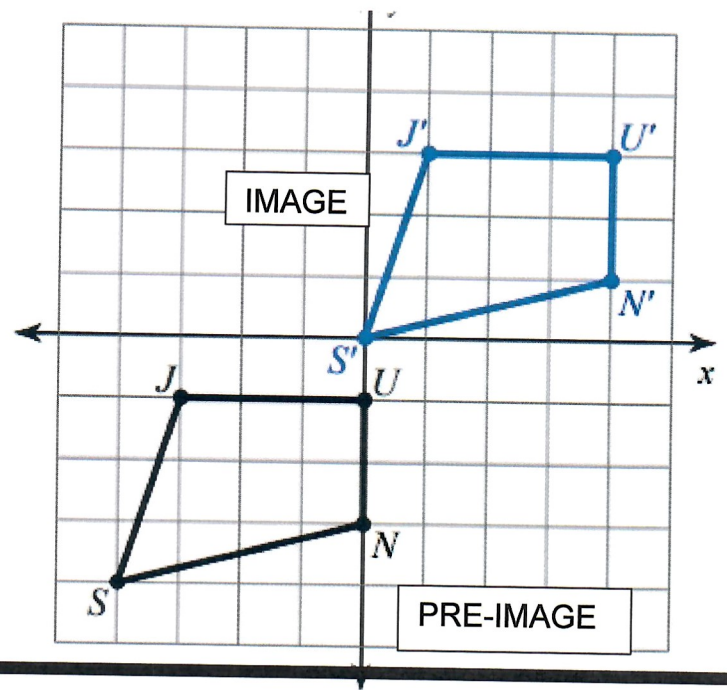
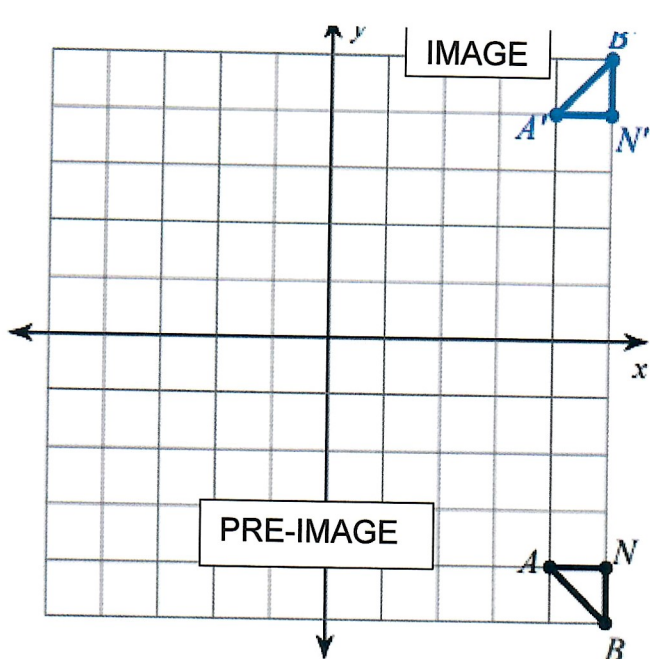
DIRECTIONS:

OBJECT OF THE GAME IS TO COMPLETE AS MANY SETS OF THREE CARDS AS POSSIBLE

1. Determine if your group is going to play with partners or by themselves.
2. Turn all cards face down in the middle of the players.
3. Turn over 2 cards at a time, trying to match the cards. If playing with a partner, each person in the pair turns over 1 card.
4. If a match is made, the players keep the matched cards. They must tell the other players how they know it is a match.
5. **LEAVE UNMATCHED CARDS FACE UP SO OTHERS MAY MATCH WITH THEM.**
6. Play continues with another player/pair when no match is made.
7. When a match of two cards is made, then the two cards may be set in front of the pair. They must **FIND THE THIRD CARD**. A complete match isn't made until **ALL THREE CARDS** are found.
8. If a player turns over a card that matches another pair's 2-card set, they may "steal" the pair's cards and keep the complete match.

CHALLENGE: Time how long it takes you to match **ALL** cards, then try to beat that time.



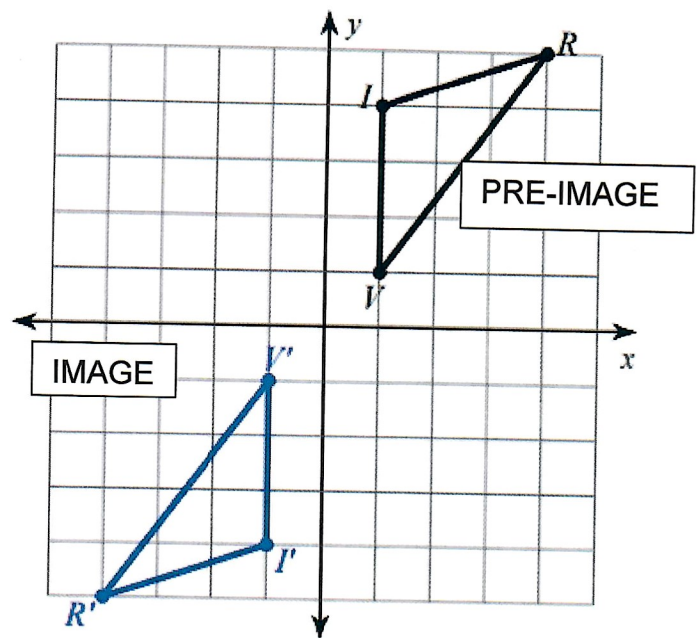
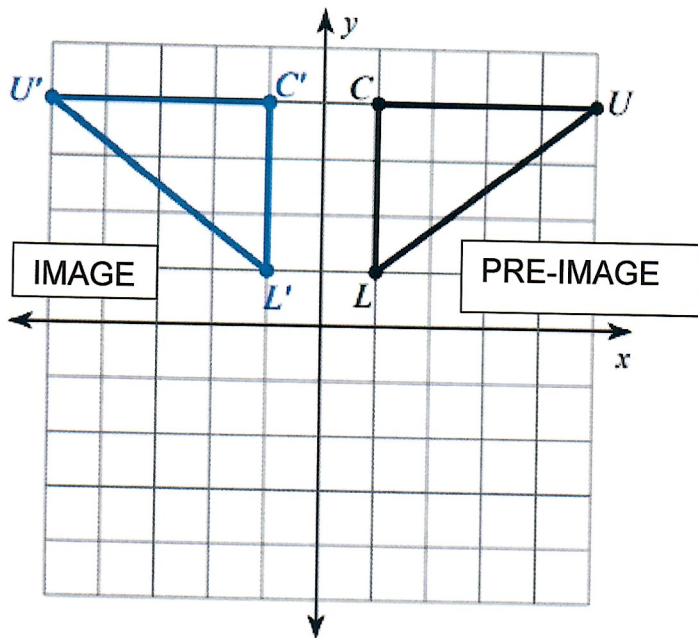


Reflection

Translation

Reflection
across the
x-axis

Four units right
and
four units up

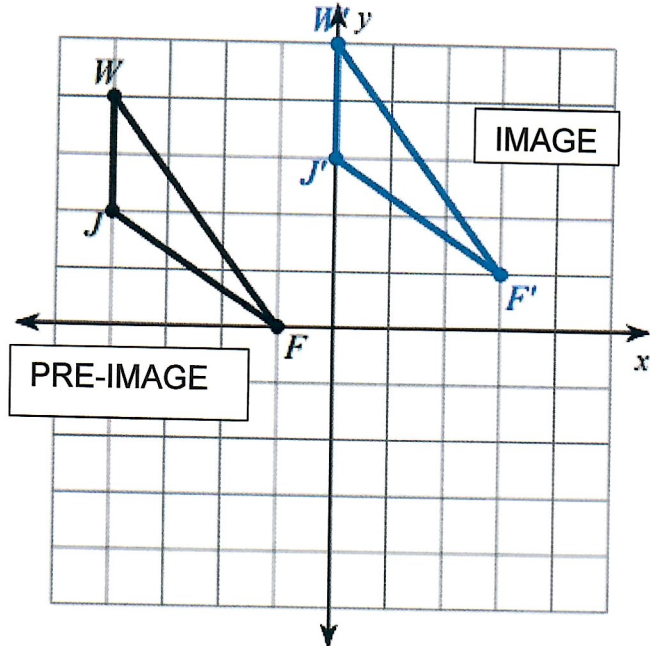


Reflection

Rotation

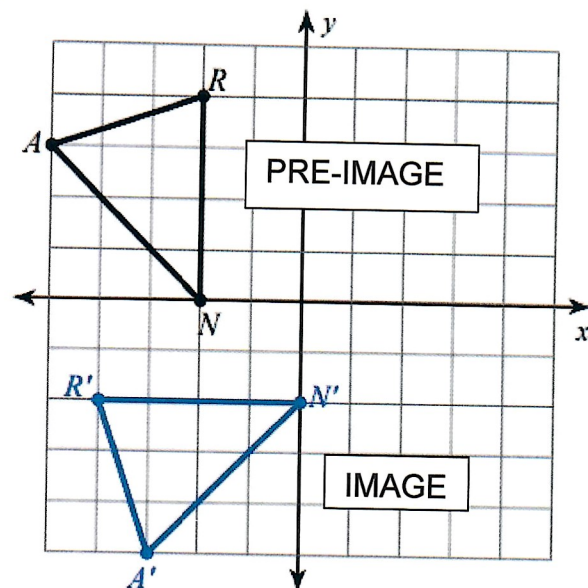
Reflection
across the
y-axis

Rotation 180°
about the origin



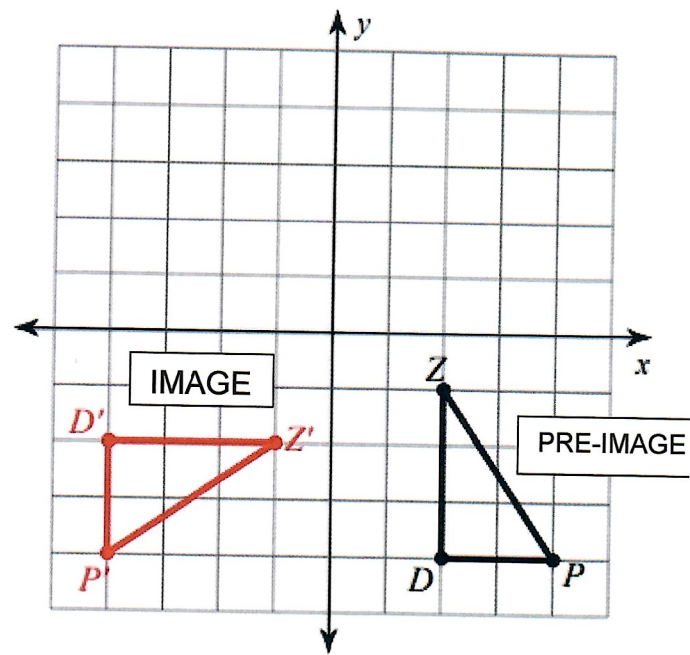
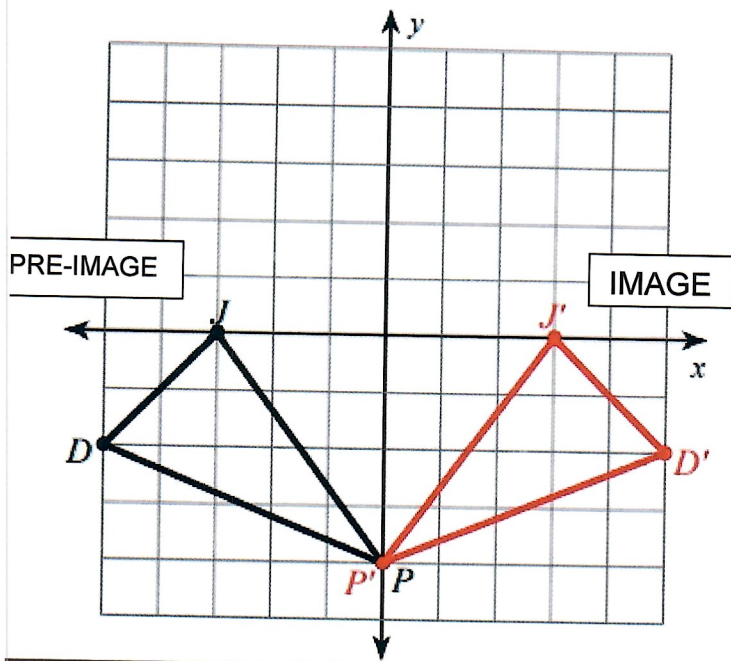
Translation

Translation 4
units right and
1 unit up



Rotation

Rotation 90°
counterclockwise
about the origin

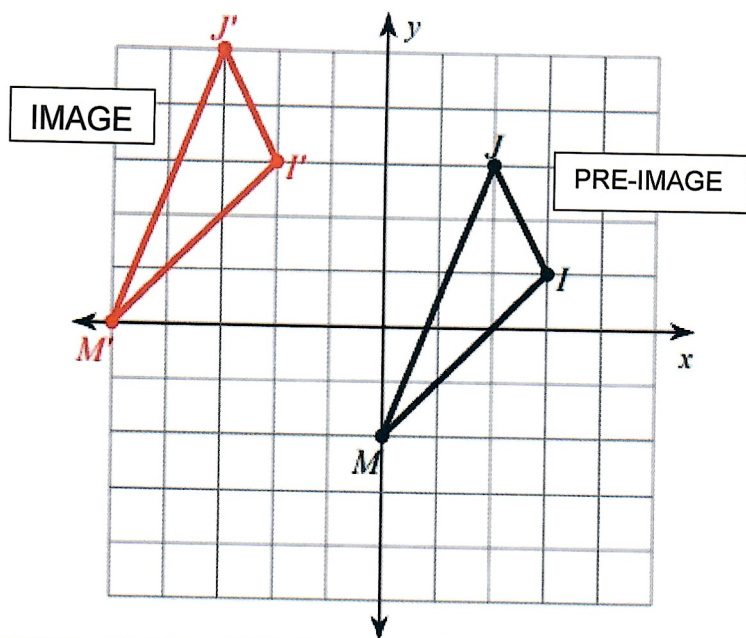


Reflection

Rotation

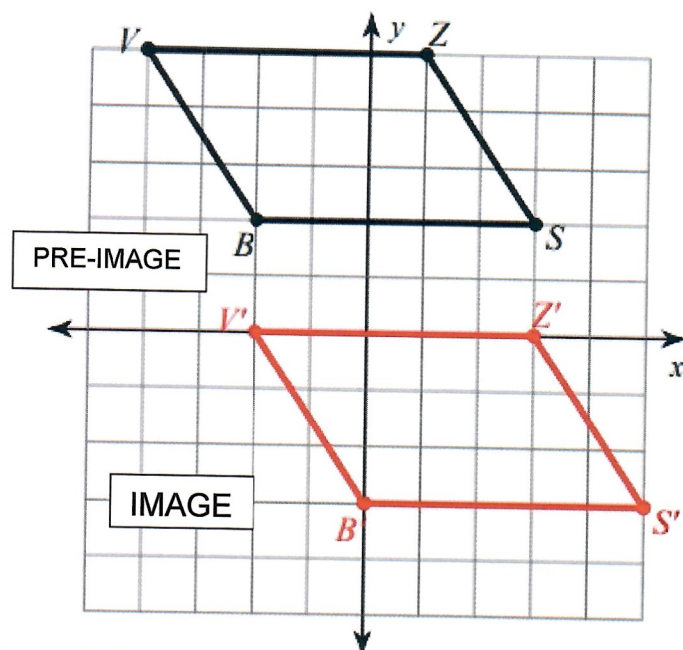
Reflection
across the
y-axis

Rotation 90°
clockwise
about the origin



Translation

Translation 5
units left and 2
units up



Translation

Translation 2
units right and
5 units down

Names: _____ Transformations Match Game, **RECORDING SHEET**

Select 4 sets of cards, write the description of the transformation, draw it, and write its algebraic representation.

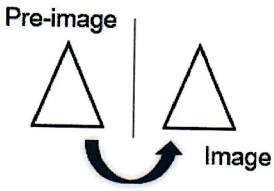
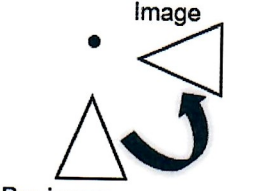
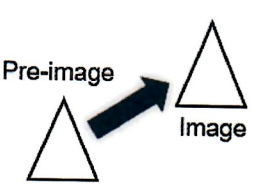
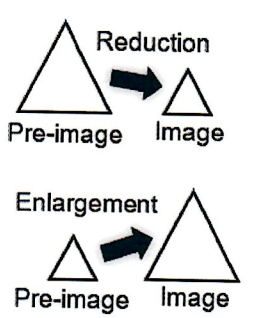
Description	Image	Description	Image
Algebraic Representation		Algebraic Representation:	
Description	Image	Description	Image
Algebraic Representation		Algebraic Representation:	

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Algebraic Representation		Algebraic Representation:	

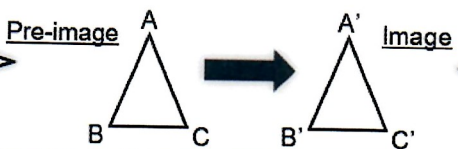
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Algebraic Representation		Algebraic Representation:	

Which transformation is the most challenging to determine? Which transformation is the easiest? Why?

1	2	3	4
Reflections - "Flips" over a given line Example:  Think about a mirror image!	Rotations - "Turns" about a point Example:  Think about turning a doorknob!	Translations - "Slides" to a new location Example:  Think about when you slide an object such as a bookcase!	Dilations - "Enlarges" or "reduces" a figure Example: 

The "pre-image" is the figure before it has undergone a transformation. The "image" is the result of the transformation. We denote the difference between the "pre-image" and "image" when we label our figure. For example,

Points are denoted with capital letters



Points have a "prime" symbol now

Algebraic Representations of Translations

The rules shown in the table describe how coordinates change when a figure is translated up, down, right, and left on the coordinate plane.

Translations	
Right a units	Add a to the x -coordinate: $(x, y) \rightarrow (x + a, y)$
Left a units	Subtract a from the x -coordinate: $(x, y) \rightarrow (x - a, y)$
Up b units	Add b to the y -coordinate: $(x, y) \rightarrow (x, y + b)$
Down b units	Subtract b from the y -coordinate: $(x, y) \rightarrow (x, y - b)$

TYPE OF ROTATION	Point on the pre-image	Point on the image (After rotation)
Rotation of 90° (clock wise)	(x, y)	$(y, -x)$
Rotation of 90° (counter clock wise)	(x, y)	$(-y, x)$
Rotation of 180° (clock wise & counter clock wise)	(x, y)	$(-x, -y)$
Rotation of 270° (clock wise)	(x, y)	$(-y, x)$
Rotation of 270° (counter clock wise)	(x, y)	$(y, -x)$

REFLECTIONS:

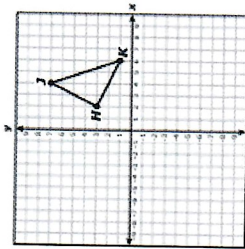
Across the x-axis	Multiply the y-coordinate by -1 $(x, y) \rightarrow (x, -y)$
Across any horizontal line $y = b$	$(x, y) \rightarrow (x, -y + 2b)$
Across the y-axis	Multiply the x-coordinate by -1 $(x, y) \rightarrow (-x, y)$
Across any vertical line $x = a$	$(x, y) \rightarrow (-x + 2a, y)$
Across $y = x$	$(x, y) \rightarrow (y, x)$
Across $y = -x$	$(x, y) \rightarrow (-y, -x)$

Name _____

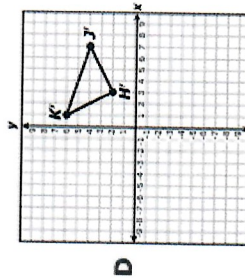
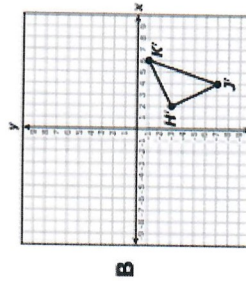
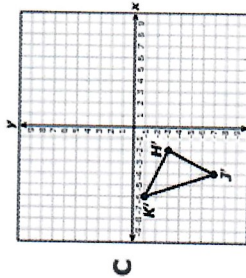
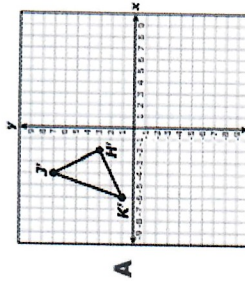
Transformations Match Game

Circle the correct solution. Explain how you know it is the correct response..

Triangle HJK is graphed on the coordinate grid. Triangle $H'J'K'$ will be transformed using the rule $(x, y) \rightarrow (-x, y)$ to create triangle $H''J''K''$.



Which graph represents triangle $H''J''K''$?



A figure was transformed on a coordinate grid using the rule $(x, y) \rightarrow (-x, -y)$. Which of the following describes this transformation?

- F** A reflection across the x-axis
- G** A reflection across the y-axis
- H** A 90° clockwise rotation about the origin
- J** A 180° clockwise rotation about the origin

Quadrilateral $PQRS$ was translated 5 units to the right and 3 units up to create quadrilateral $P'Q'R'S'$. Which rule describes this transformation?

- F** $(x, y) \rightarrow (x - 5, y - 3)$
- G** $(x, y) \rightarrow (x + 5, y + 3)$
- H** $(x, y) \rightarrow (x - 3, y - 5)$
- J** $(x, y) \rightarrow (x + 3, y + 5)$
