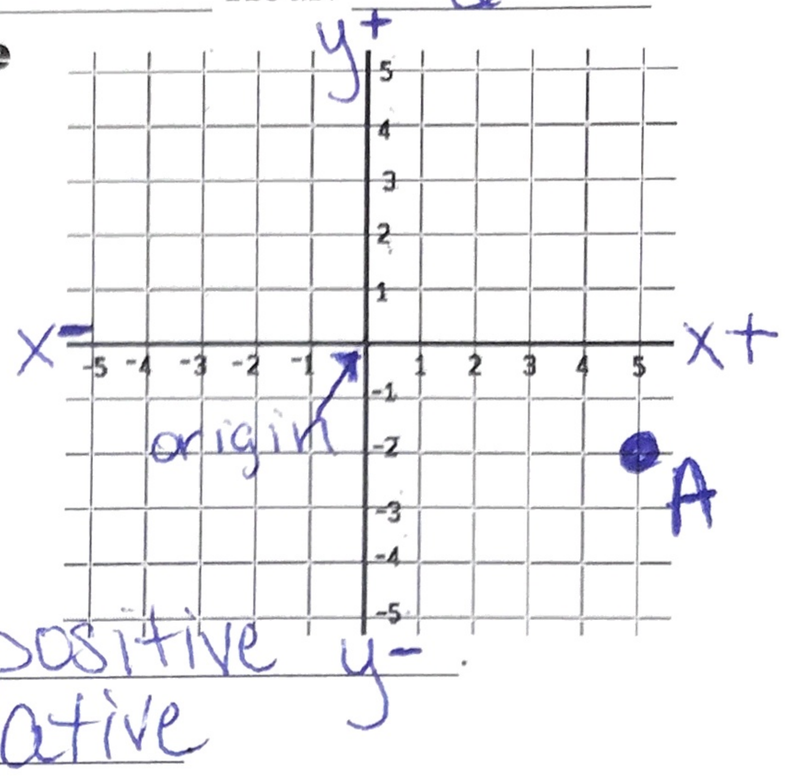
Name: _____ Date: Feb 12 Hour: 6th

Unit 6A Day 5 and 6: Translations on the coordinate plane

Focus Question: How do I use the rules for translations?



A. Graphing on the coordinate plane
Graph the following points on the graph
Describe how you got to each point….

1. Point A is at (5, -2)

I started at the origin.

Then I moved 5 spaces to the right because x was positive.

Then I moved 2 spaces down because y was negative

2. Point B is at (-3, 7)

I started at the origin.

Then I moved 3 spaces to the left because x was negative.

Then I moved 7 spaces up because y was positive.

B. Translations on the Coordinate Plane (to move)

1. Plot the point A (1, 2).
Move it to the **right** 5 spaces. What are the coordinate of A'?

(6, 2)

Which value (x or y) changed?
Did it get bigger or smaller?

2. Plot the point B (7, -3).
Move it to the **left** 2 spaces. What are the coordinate of B'?

(5, -3)

Which value (x or y) changed?
Did it get bigger or smaller?

3. Plot the point C (-3, 1).
Move it **up** 4 spaces. What are the coordinate of C'?

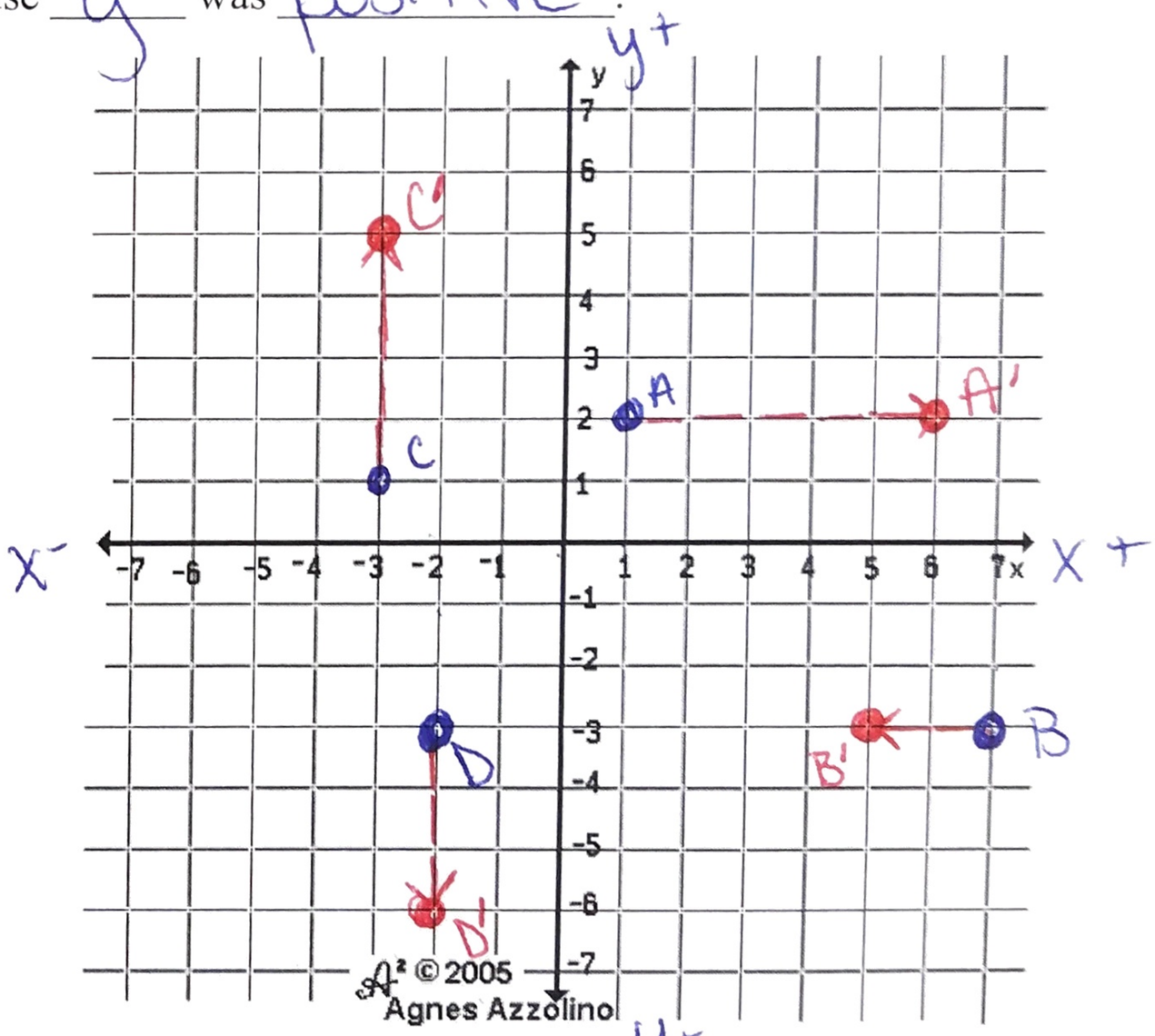
(-3, 5)

Which value (x or y) changed?
Did it get bigger or smaller?

4. Plot the point D (-2, -3).
Move it **down** 3 spaces. What are the coordinate of D'?

(-2, -6)

Which value (x or y) changed?
Did it get bigger or smaller?

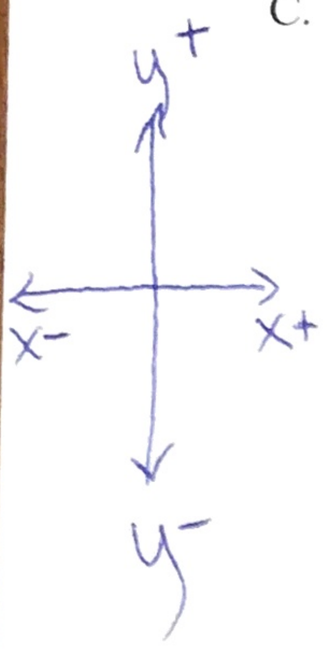


5. Complete the rules of translations

To move left (Any #)	**To move right** (Any #)
$(x, y) \rightarrow$ (x-2, y)	$(x, y) \rightarrow$ (x+5, y)
To move up (Any #)	**To move down** (Any #)
$(x, y) \rightarrow$ (x, y+4)	$(x, y) \rightarrow$ (x, y-3)

(x, y) "the point"
→ "moves"

C. Reading, Writing, and Applying Coordinate Notation:
Explain how each translation would move a figure or point.



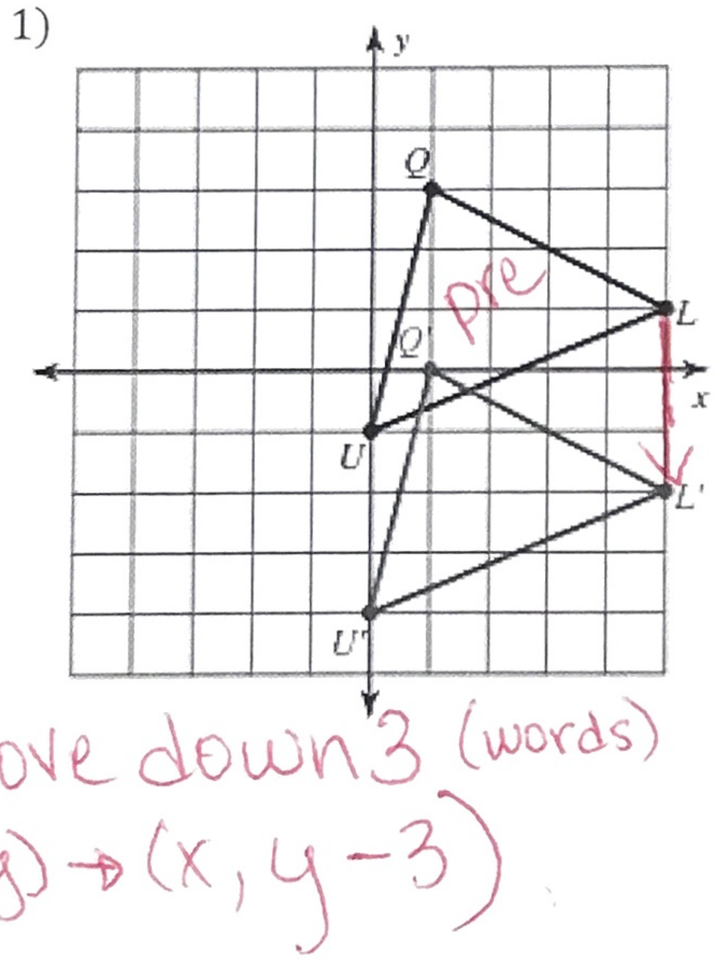
1. $(x, y) \rightarrow (x+4, y-2)$ the point moves right 4 & down 2
2. $(x, y) \rightarrow (x-3, y-5)$ the point moves left 3 & down 5.
3. $(x, y) \rightarrow (x+1, y+9)$ the point moves right 1 & up 9
4. $(x, y) \rightarrow (x, y+8)$ the point moves up 8
5. $(x, y) \rightarrow (x-6, y)$ the point moves left 6

Give the rule that would move each point the indicated direction(s).

6. A point moves left 4 and up 2: $(x,y) \rightarrow (x-4, y+2)$
7. A point moves down 7: $(x,y) \rightarrow (x, y-7)$
8. A point moves down 3 and right 6: $(x,y) \rightarrow (x+6, y-3)$
9. A point moves left 9: $(x,y) \rightarrow (x-9, y)$

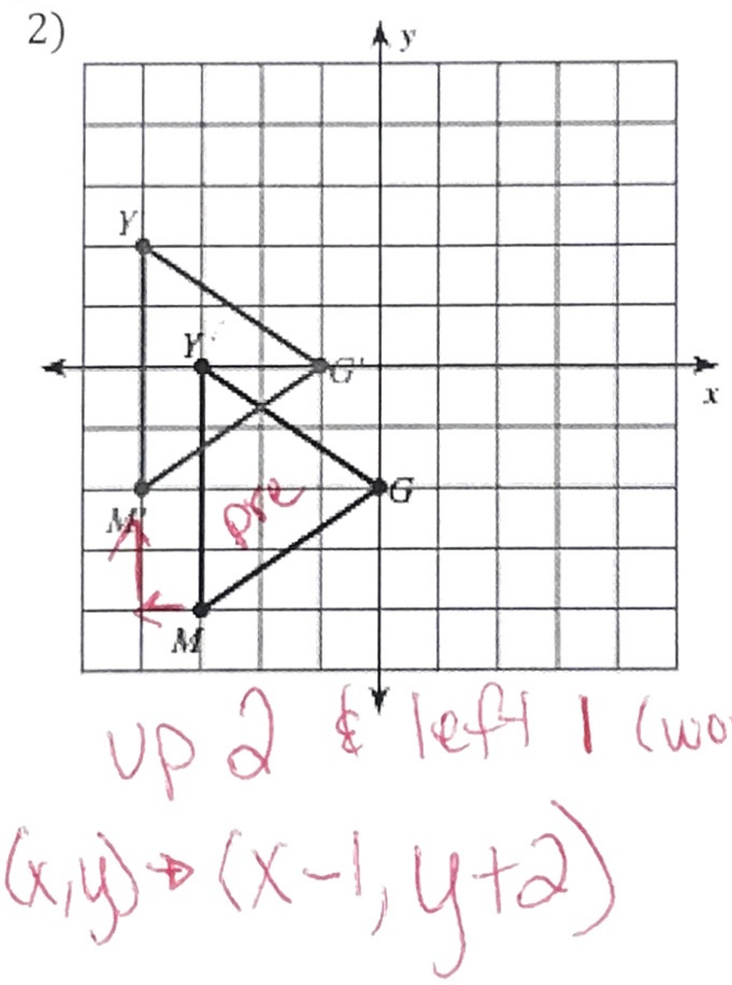
D. Describing a translated figure
Write a translation for each pair of figures below. Remember to determine the pre-image! No primes

1)



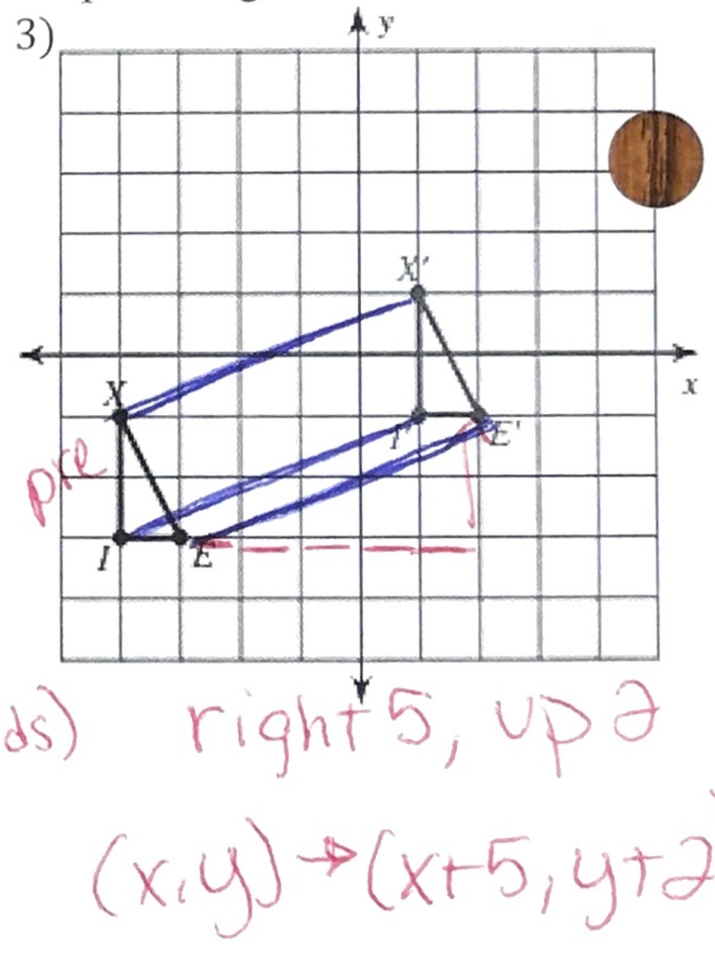
move down 3 (words)
$(x,y) \rightarrow (x, y-3)$

2)



up 2 & left 1 (words)
$(x,y) \rightarrow (x-1, y+2)$

3)



right 5, up 2
$(x,y) \rightarrow (x+5, y+2)$

4. Using picture 3, connect each point of the pre-image to its corresponding point on the image. What observations can you make about the lines you drew?
- makes it look 3-D
- they are congruent
- they are parallel

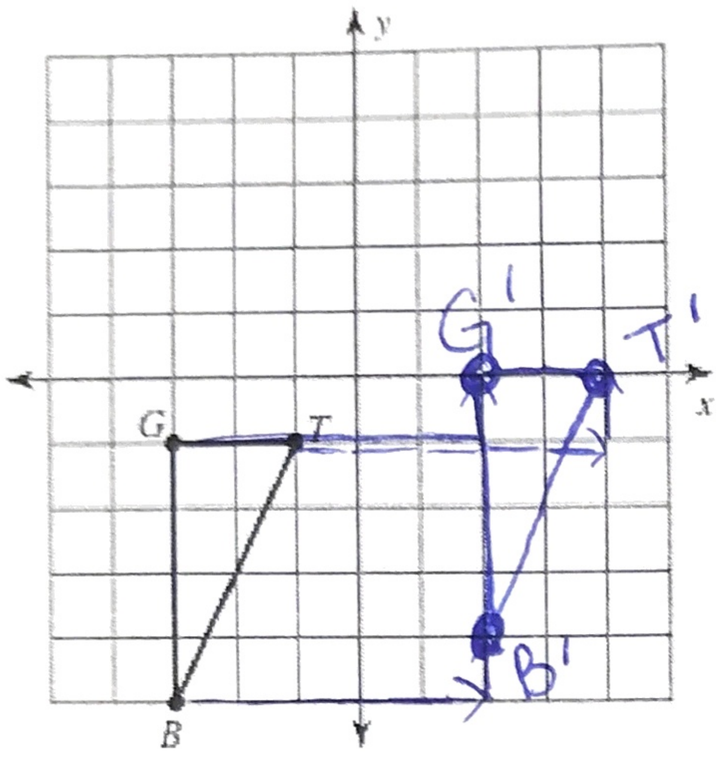
Summary statement: A translation IS an isometry that moves points the same distance along parallel paths.

E. Practice performing translations using the provided worksheet.

Translations Practice Sheet Name: _____

Perform each translation below. Then, give the coordinates of the image.

1) translation: 5 units right and 1 unit up

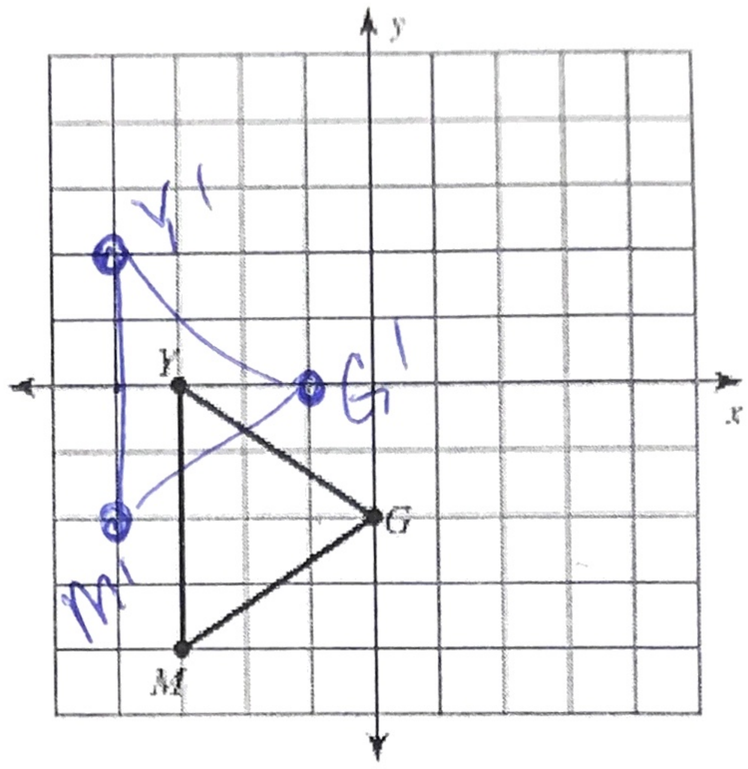


T'(4,0)

B'(2,-4)

G'(2,0)

2) translation: 1 unit left and 2 units up



Y'(-4,2)

G'(-1,0)

M'(-4,-2)

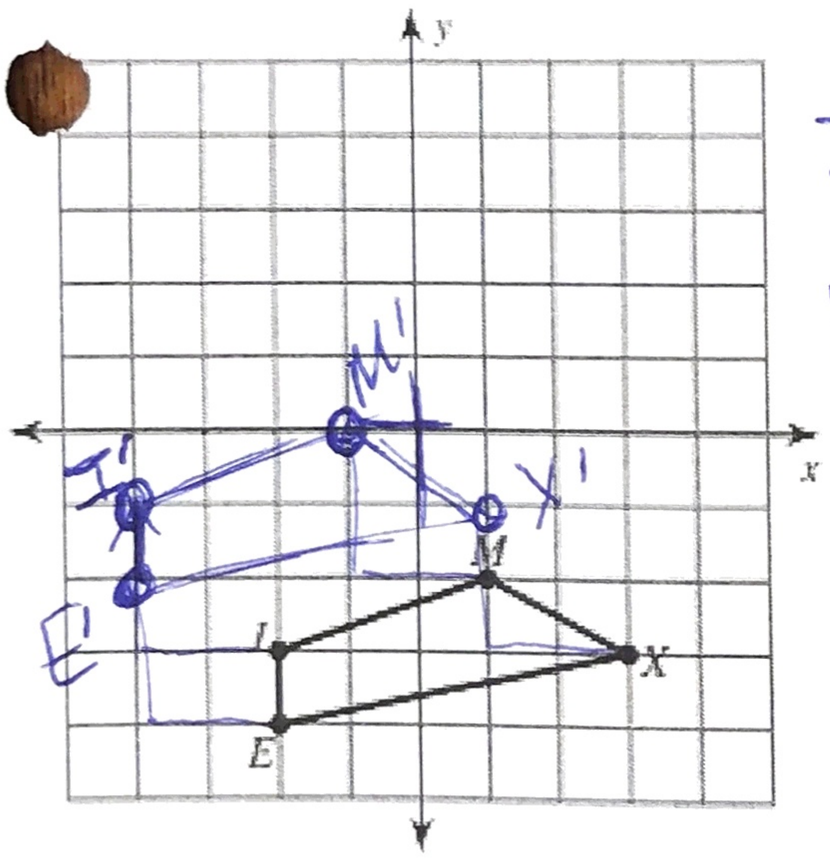
left 2 up 2

3) $(x, y) \rightarrow (x - 2, y + 2)$

x- x+ y+ y-

down 3

4) $(x, y) \rightarrow (x, y - 3)$

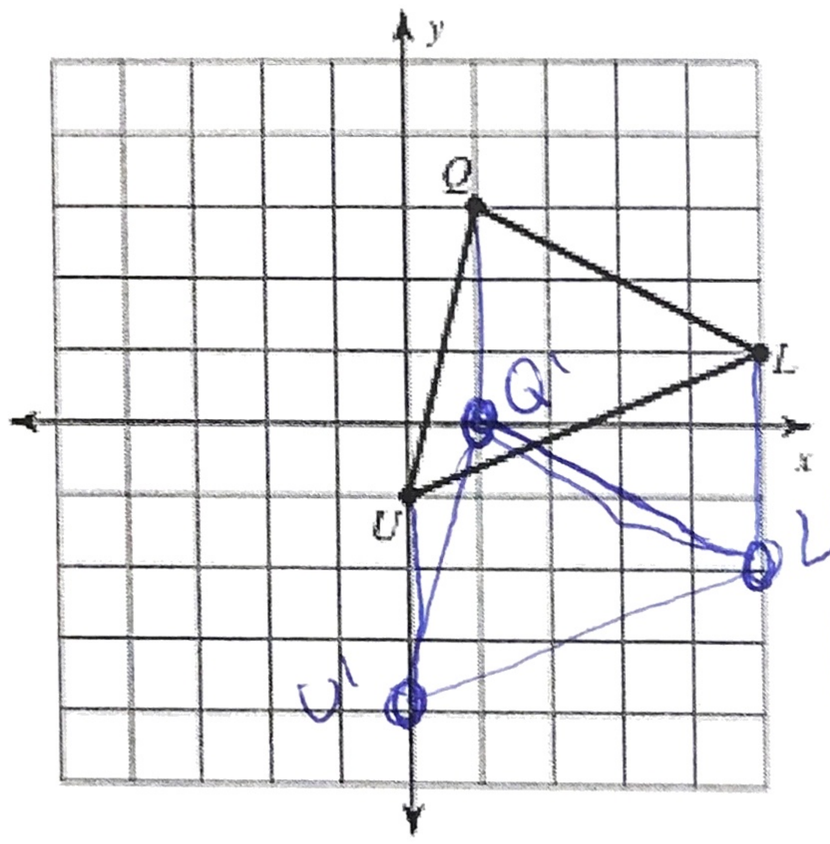


I'(-4,-1)

E'(-4,-2)

M'(-1,0)

X'(1,-1)



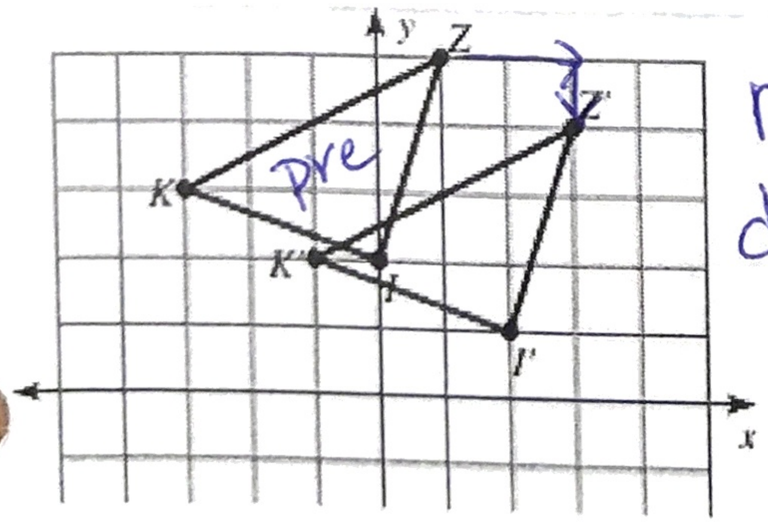
Q'(1,0)

L'(5,-2)

U'(0,-4)

Describe each translation below in words and coordinate notation.

5)



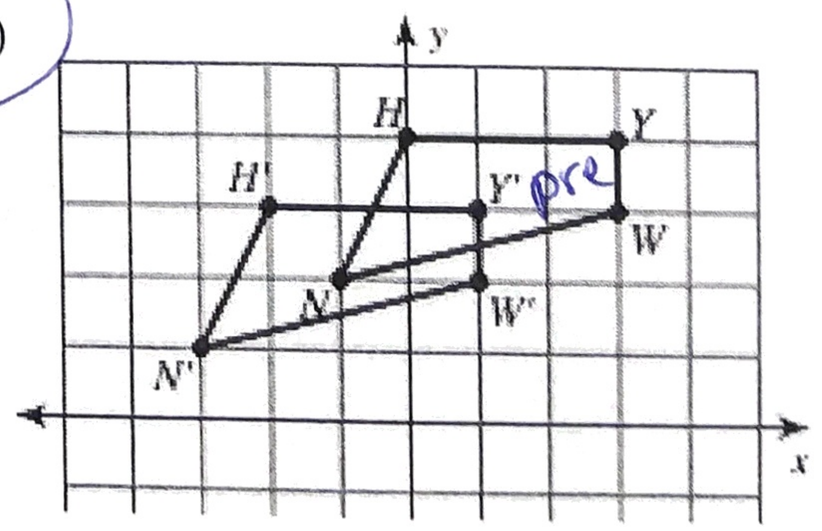
pre

right 2

down 1

$(x, y) \rightarrow (x + 2, y - 1)$

6)

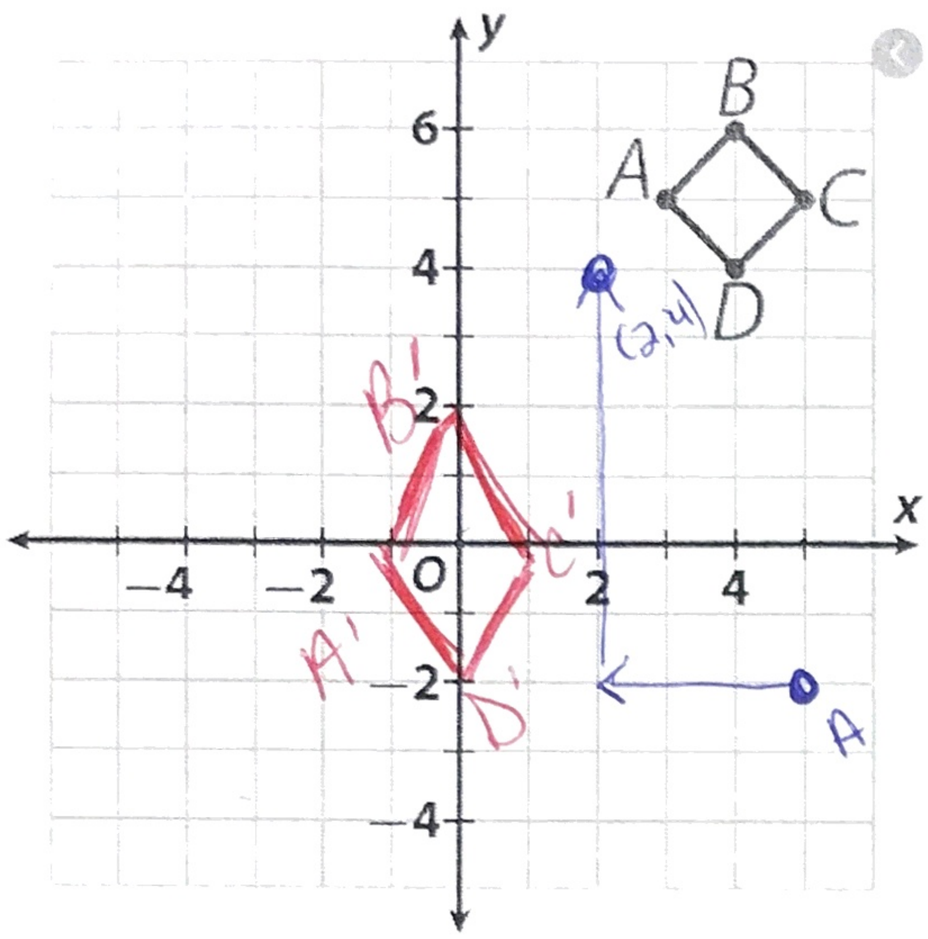


pre

left 2 down 1

$(x, y) \rightarrow (x - 2, y - 1)$

7) Margot had to translate the figure below left 3 units and down 5 units. Her attempt is shown below.



a) How can Margot tell that her answer is wrong?

Its not the same shape.

Its not congruent.

b) Explain her error(s) in reasoning.

8) George was asked the following question…

> Point A is located at (5, -2). Point A' is the image of point A translated 3 units left and 6 units up. What are the coordinate of A'? (x, y)

George claims he does not need a graph in order to find the answer. He explains his thinking in the following way….

If I write the translation as (x, y)→ (x – 3, y + 6) then I can just substitute 5 for x and -2 for y. This will give me (5, -2) → (5 – 3, -2 + 6). Since 5 – 3 = 2 and -2 + 6 = 4, the answer is A' is at (2, 4).

Do you agree or disagree with George? Explain.

Agree ① (x,y) can be substituted with #'s

② We got the same answer on a graph