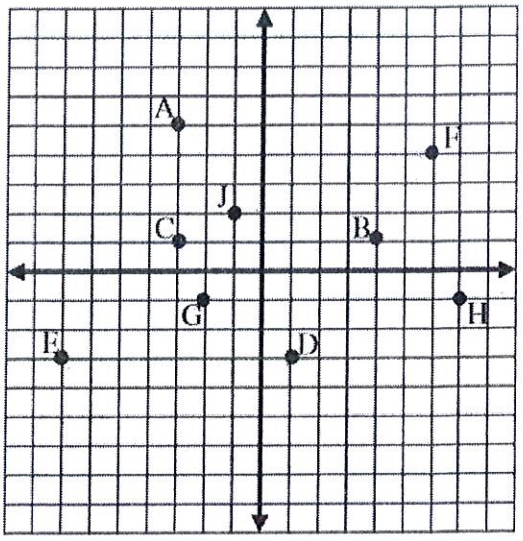
Geometry Name: _____

Reflections Date: _____

Warm-up – Translations

Use the graph on the right to answer the following.



1. $\langle 2,1 \rangle$ maps C → J (-1, 2)
2. What vector maps A → J? $\langle 2, -3 \rangle$
3. B → F shows a $\langle 2,3 \rangle$ mapping
4. What vector maps C → E? $\langle -4, -4 \rangle$
5. $\langle 5,2 \rangle$ maps E → G
6. $\langle 3,1 \rangle$ – followed by $\langle 1,-5 \rangle$ – maps C → D

Name the vector used to map the preimage to the image.

7. (5, 2) → (-2, 1) $\langle -7, -1 \rangle$ $-2-5=-7$ $1-2=-1$
8. (-3, 7) → (-5, 3) $\langle -2, -4 \rangle$ $-5-3=-2$ $3-7=-4$
9. (8, -3) → (5, -3) $\langle -3, 0 \rangle$ $5-8=-3$ $-3-3=0$
10. (-5, -1) → (3, 4) $\langle 8, 5 \rangle$ $3-5=8$ $4-1=5$

Name the single translation vector that would map the preimage to the image for the composite transformations. (2 or more transformations)

11. $\langle 5,3 \rangle$ followed by $\langle 2,8 \rangle$: $\langle 7, 11 \rangle$
12. $\langle 1,5 \rangle$ followed by $\langle 3,2 \rangle$: $\langle 4, 7 \rangle$
13. $\langle 4,6 \rangle$ followed by $\langle 5,-9 \rangle$: $\langle 9, -3 \rangle$
14. $\langle -3,-5 \rangle$ followed by $\langle 3,8 \rangle$: $\langle 0, 3 \rangle$
15. $\langle 8,2 \rangle$ followed by $\langle 2,-4 \rangle$ followed by $\langle 4,0 \rangle$: $\langle 14, -2 \rangle$

$8+2+4=14$

$2+(-4)+0=-2$

16. What is the image of P(1,3) when it is translated along the vector $\langle -3,5 \rangle$? $1+(-3)=-2$ $3+5=8$

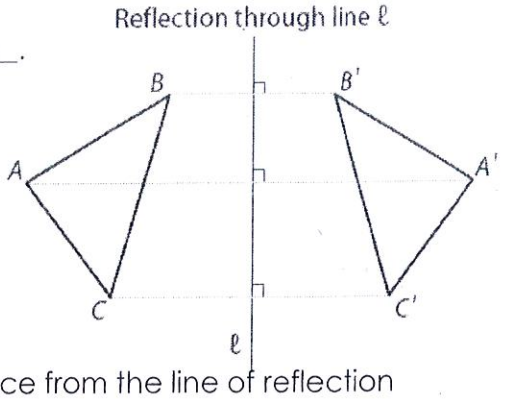
(A.) (-2, 8) B. (0, 6) C. (1, 3) D. (0, 4)

→2 ↓2 $\langle 2, -2 \rangle$

17. After a translation, the image of A(-6, -2) is B(-4, -4). What is the image of the point C(3, -1) after this translation? $3+2=5$ $-1+(-2)=-3$

A. (-5, 1) (B.) (5, -3) C. (5, 1) D. (-5, -3)

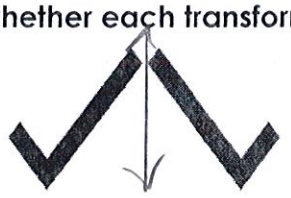
A reflection is a transformation where each point in a shape appears at an equal distance on the opposite side of a given line, called the line of reflection.



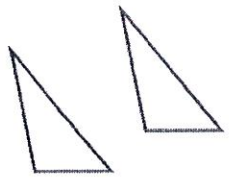
It preserves congruence so it is an isometry.

Each point in the preimage will move twice the distance from the line of reflection along a line that is perpendicular to the line of reflection.

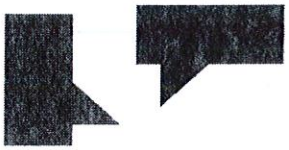
Tell whether each transformation appears to be a reflection and explain.

1. 

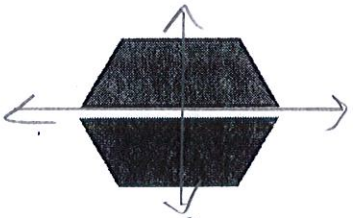
yes

2. 

No, Its a translation

3. 

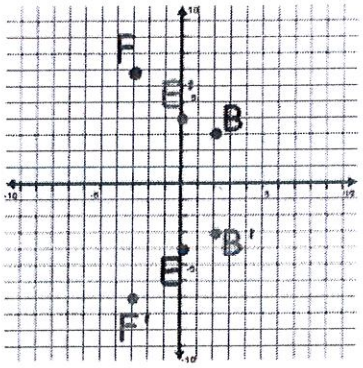
No, Its a rotation.

4. 

yes

X-AXIS REFLECTION

Pre-Image	Image
F: (–3, 7)	F': (-3, -7)
E: (0, –4)	E': (0, 4)
B: (2, 3)	B': (2, -3)

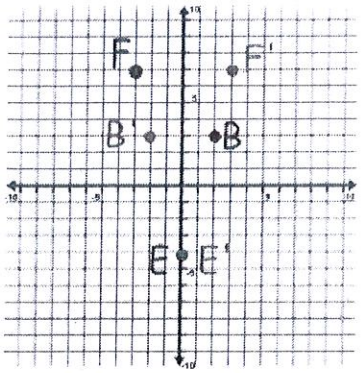


When reflecting across the x-axis what coordinate changes and how? y-coordinate changes signs

What coordinate stays the same? x So, (x, y) → (x, -y).

Y-AXIS REFLECTION

Pre-Image	Image
F: (–3, 7)	F': (3, 7)
E: (0, –4)	E': (0, –4)
B: (2, 3)	B': (–2, 3)



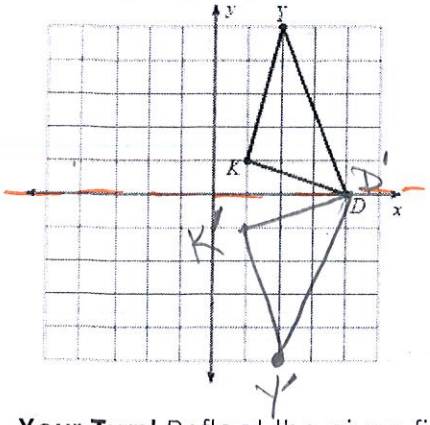
When reflecting across the y-axis what coordinate changes and how? x-coordinate changes sign

What coordinate stays the same? y So, (x, y) → (–x, y).

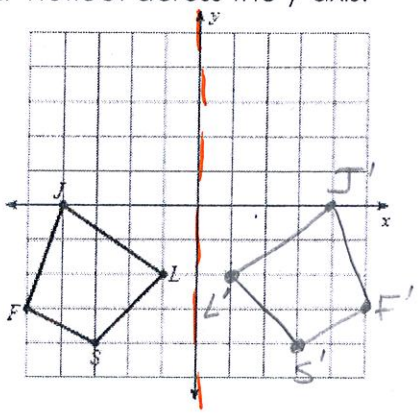
**Note: If E is on the line of reflection, then E and E' are the same point.

Let's Try! Reflect the given figure across the given axis.

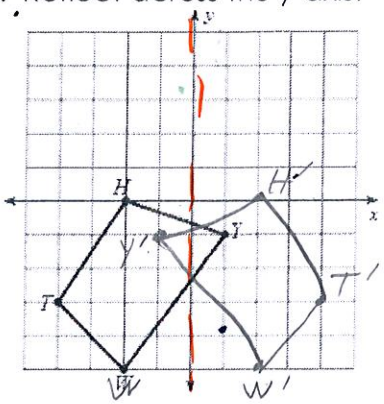
1. Reflect across the x-axis.



2. Reflect across the y-axis.

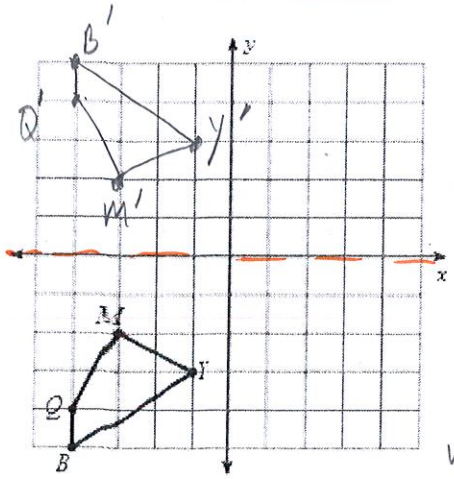


3. Reflect across the y-axis.

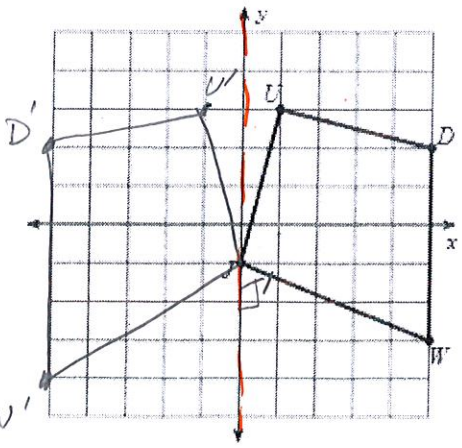


Your Turn! Reflect the given figure across the given axis.

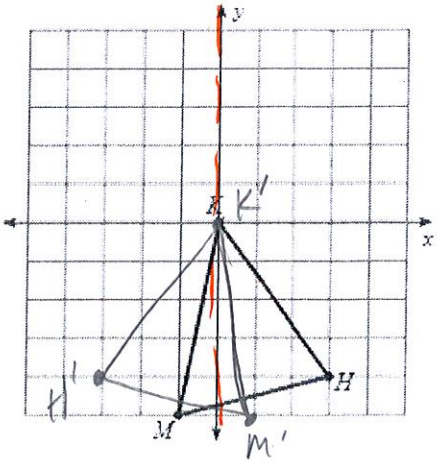
1. Reflect across the x-axis.



2. Reflect across the y-axis.

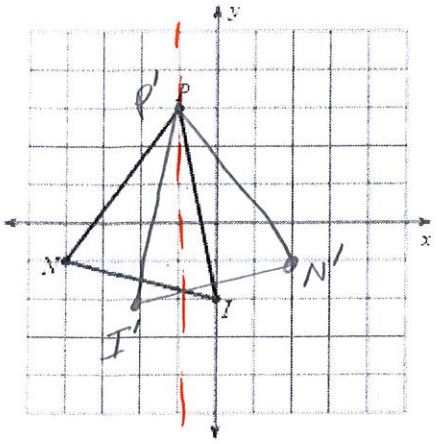


3. Reflect across the y-axis.

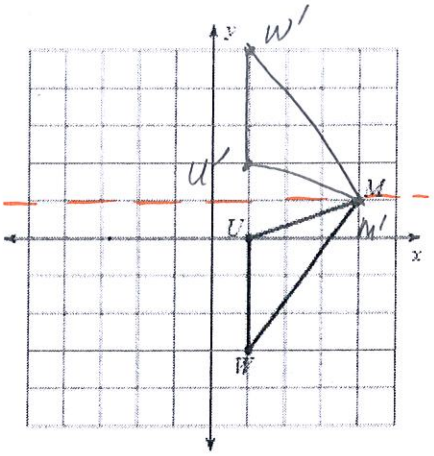


What if the line of reflection is not the x- or y-axis?

Ex 1. Reflection across x = –1



Ex 2. Reflection across y = 1

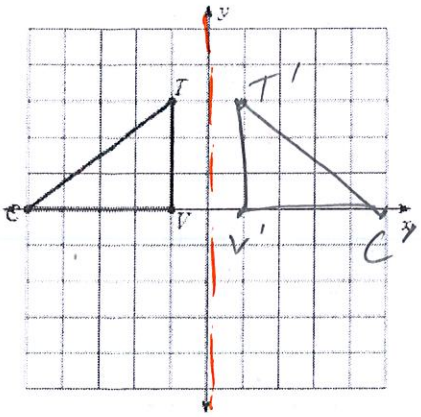


REMEMBER:

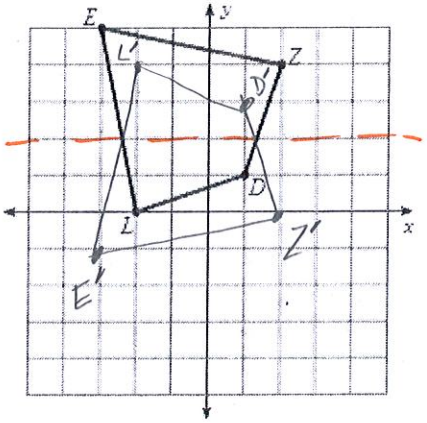
A horizontal line will have the equation y = #, while a vertical line will have the equation x = #.

Your Turn! Reflect the figure over the given line of reflection.

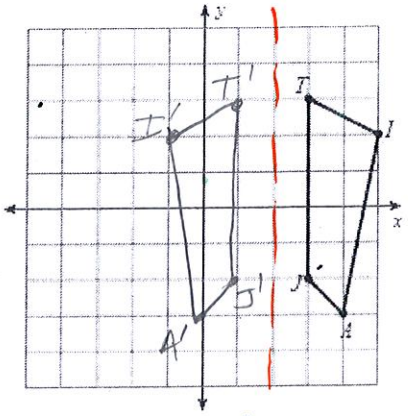
1. Reflect across x = 0



2. Reflect across y = 2

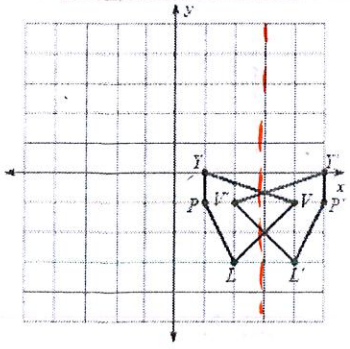


3. Reflect across x = 2

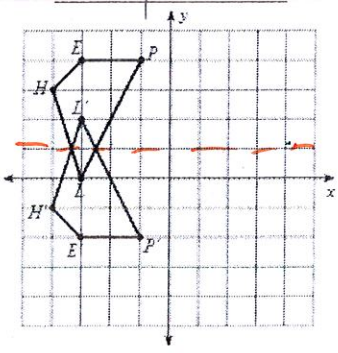


Write the line of reflection for the following graphs.

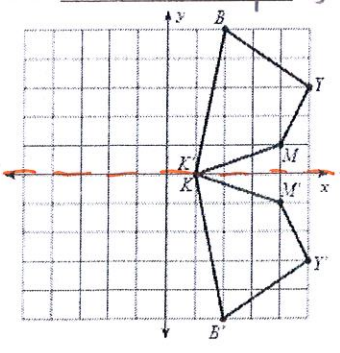
1. X = 3



2. Y = 1



3. X-axis (y=0)



4. Y-axis (x=0)