Geometry

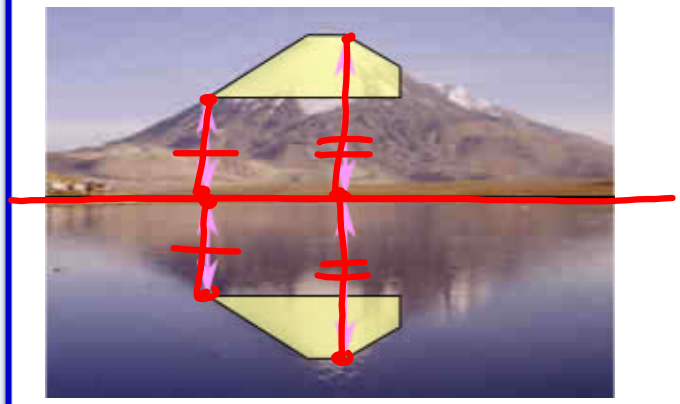
Ch. 9 Handout 9.2

Reflections

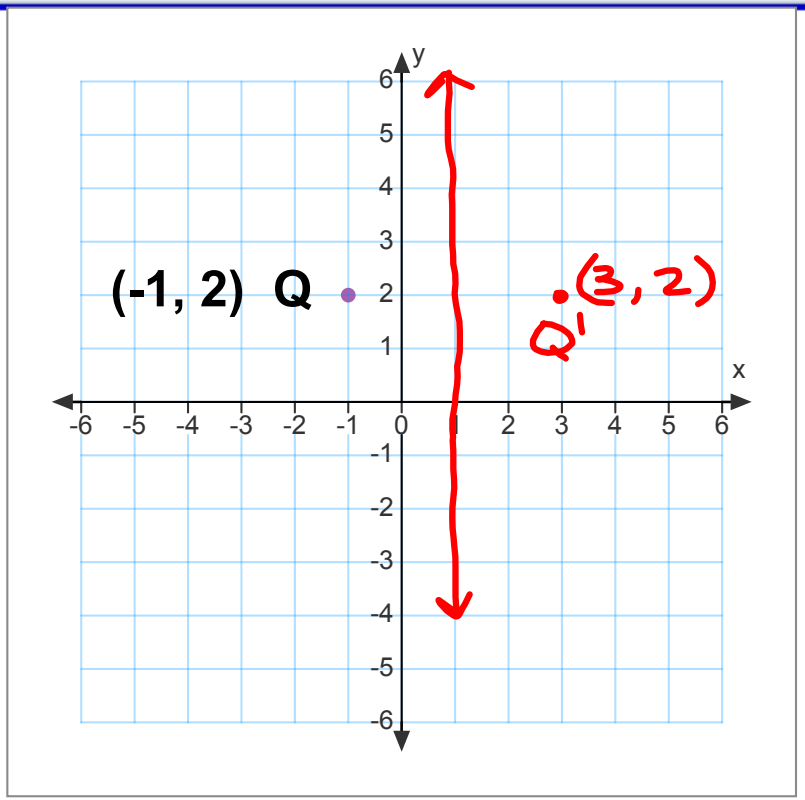
Reflection (or flip)

-- is an transformation in which a figure and its image have opposite orientations. Thus, a reflected image in a mirror appears "backwards".

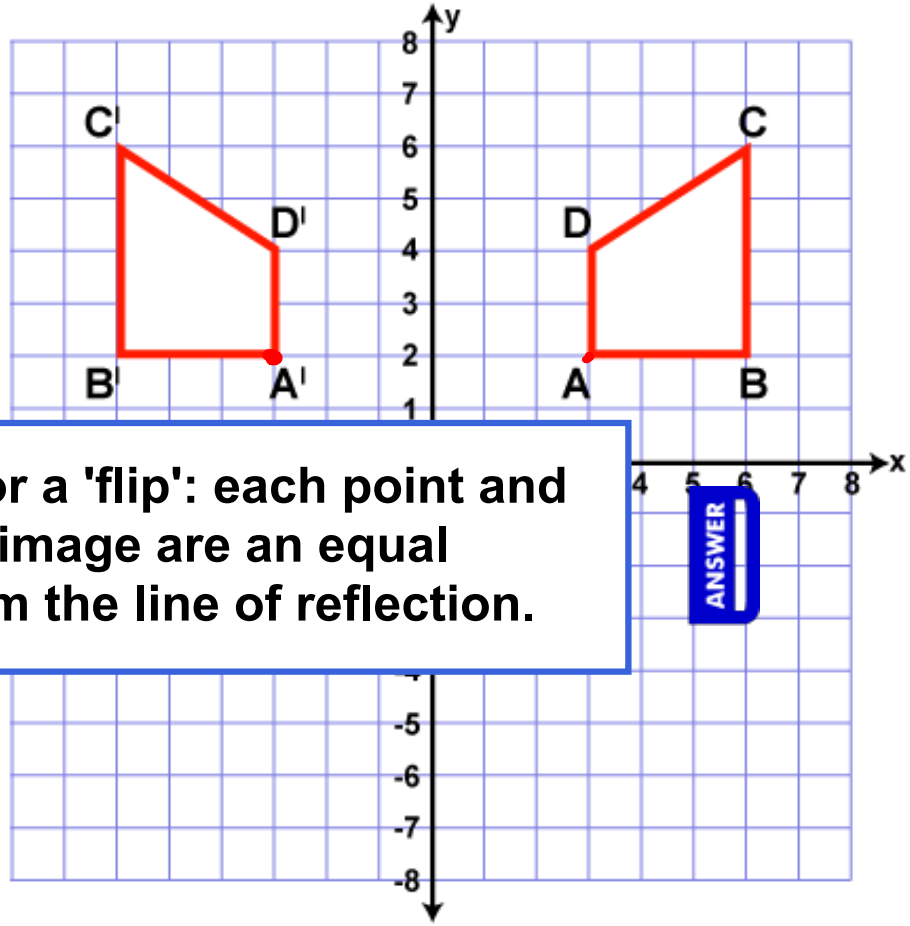
Examples of Reflection



If point Q (-1, 2) is reflected across line x = 1, what are the coordinates of its reflection image? What are the coordinates of the image of Q if the reflection line is y = -1?



Describe this transformation



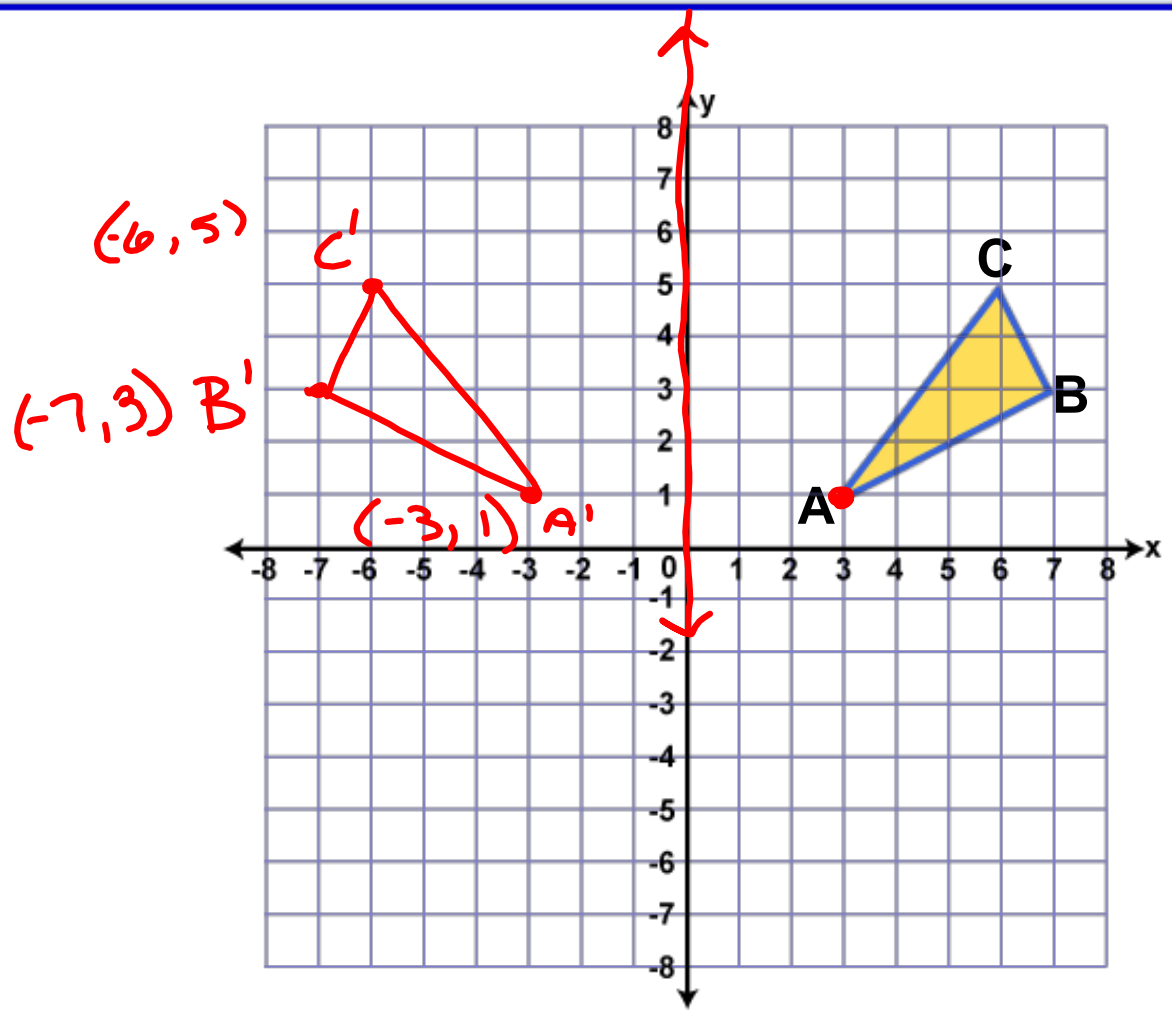
A refection or a 'flip': each point and its reflected image are an equal distance from the line of reflection.

ANSWER

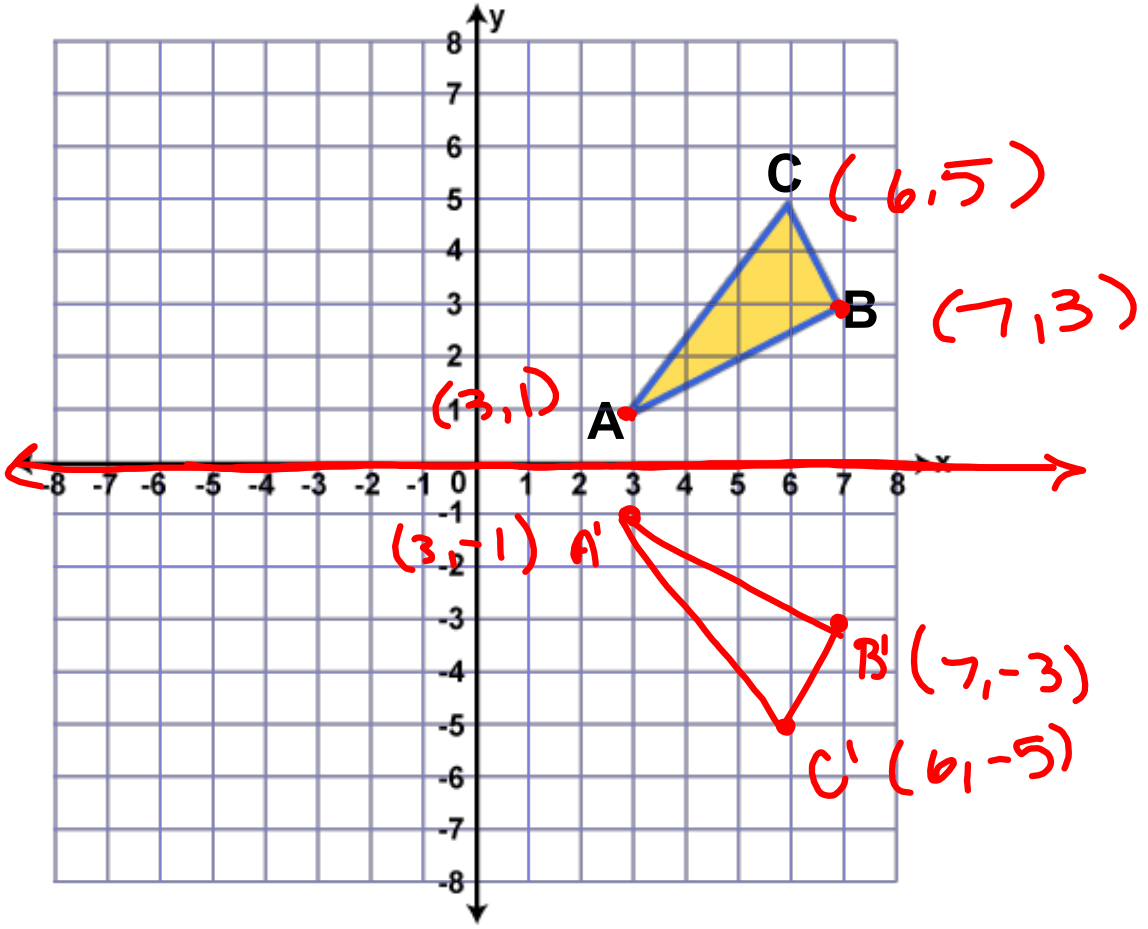
CLICK

Reflect ABC across the y-axis

Pull



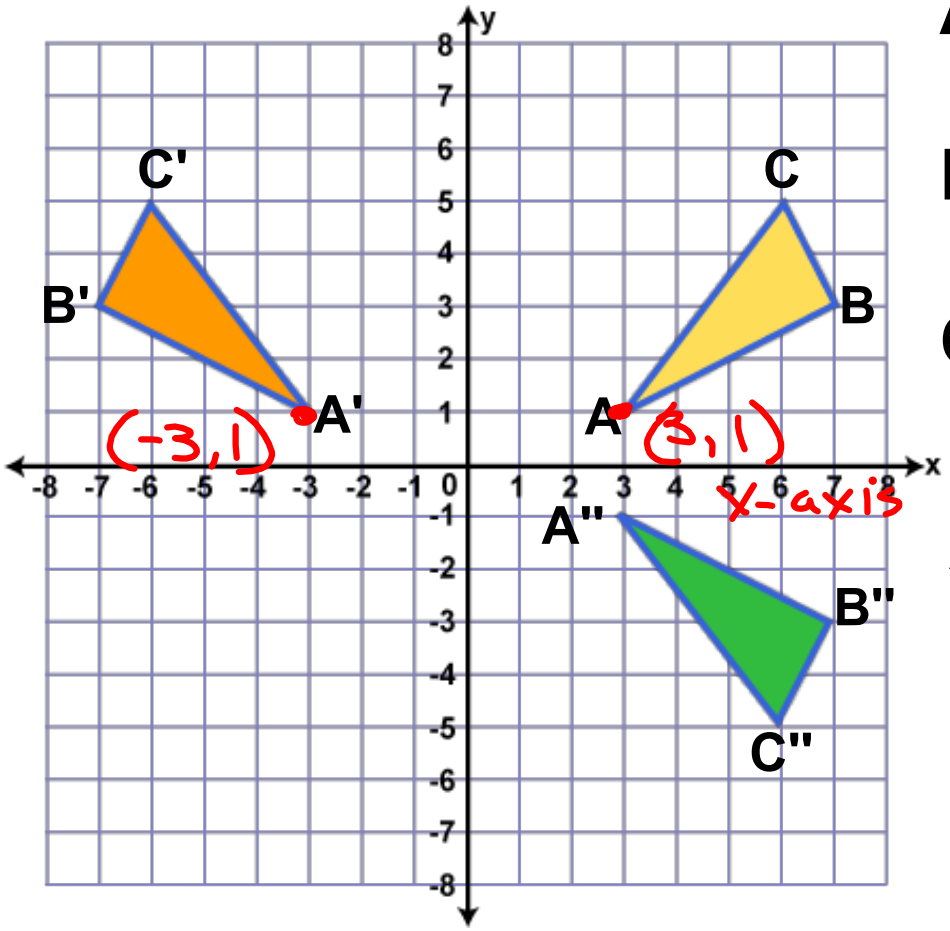
Reflect ABC across the x-axis



What do you notice?

ANSWER

y-axis $(x, y) \rightarrow (-x, y)$



A(3,1) A'(-3, 1)

B(7,3) B'(-7, 3)

C(6,5) C'(-6, 5)

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

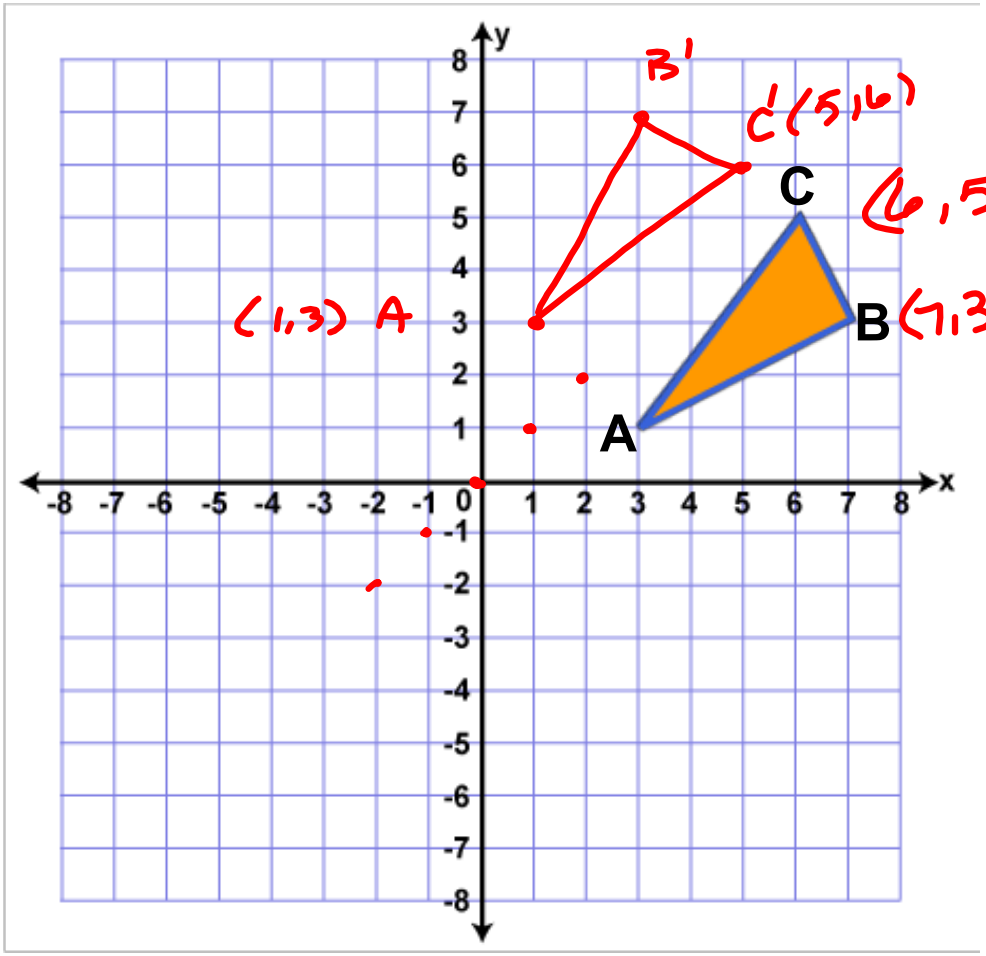
A(3,1) A"(3, -1)

B(7,3) B"(7, -3)

C(6,5) C"(6, -5)

Reflect ABC across the line y = x

HINT



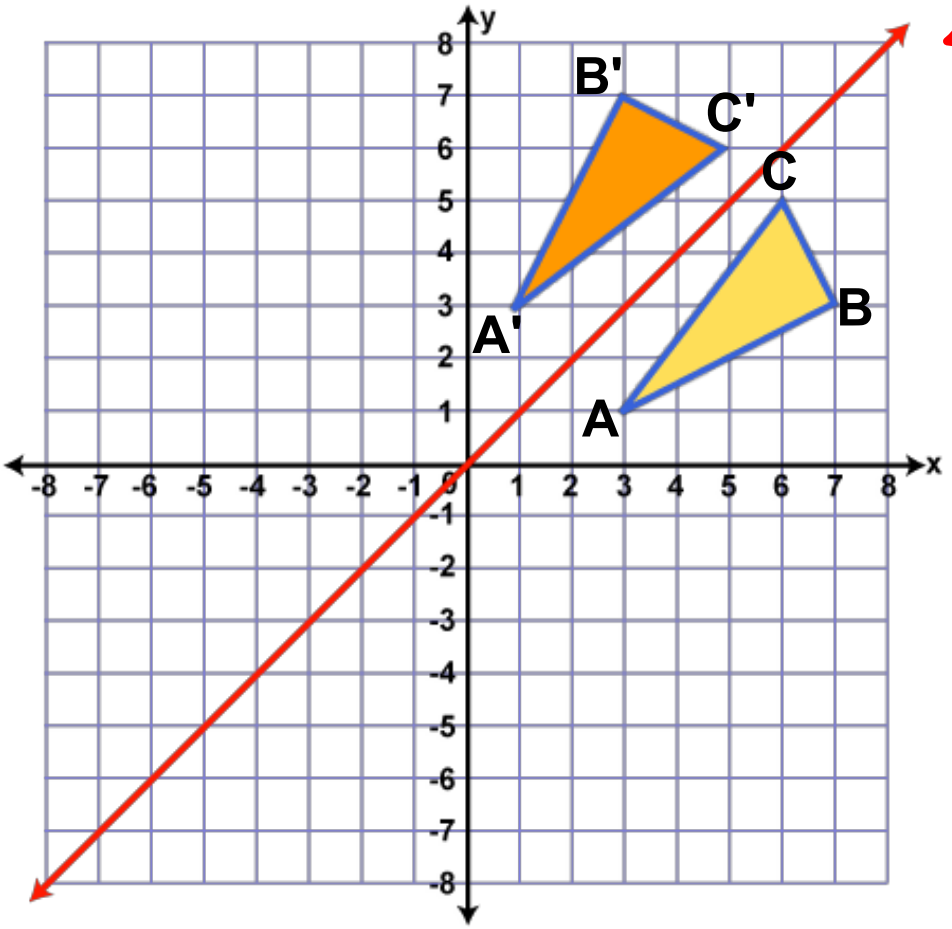
$(x, y) \rightarrow (y, x)$

A(3,1) A'(1 , 3)

B(7,3) B'(3 , 7)

C(6,5) C'(5 , 6)

What do you notice?



Line of Reflection $y=x$

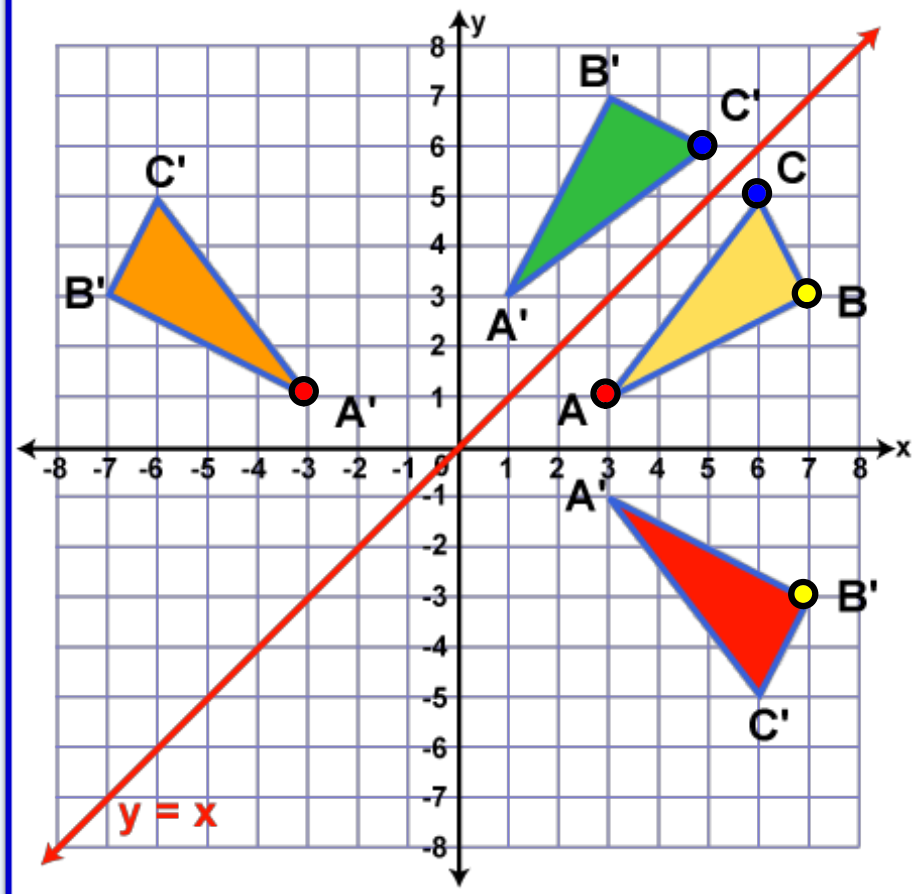
$(x,y) \rightarrow (y,x)$

A(3,1) A'(1,3)

B(7,3) B'(3,7)

C(6,5) C'(5,6)

Reflection summary



... across the y-axis

(x, y) ⟶ (-x, y)

CLICK

... across the x-axis

(x, y) ⟶ (x, -y)

CLICK

... across the line y = x

(x, y) ⟶ (y,x)

CLICK

Common Rules for Reflection across the x-axis, y-axis, orgin, and line y = x

1. y-axis -- "change x, keep y" $(x, y) \rightarrow (-x, y)$

2. x-axis -- "keep x, change y" $(x, y) \rightarrow (x, -y)$

3. across the line y = x -- swap x and y $(x, y) \rightarrow (y, x)$

4. through origin -- "change x, change y" $(x, y) \rightarrow (-x, -y)$

Match the line of reflection

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

Reflection across the x-axis

C(7,3) ⟶ C'(7,-3)

B(-3,1) ⟶ B'(-3,-1)

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

Reflection across the y-axis

E(-5,6) ⟶ E'(5,6)

$(x,y) \rightarrow (y,x)$

Reflection across the line y=x

D(-8,-3) ⟶ D'(-3,-8)

A(3,1) ⟶ A'(1,3)

Solution

Reflection across the x-axis

B(-3,1) ⟶ B'(-3,-1)

C(7,3) ⟶ C'(7,-3)

Reflection across the y-axis

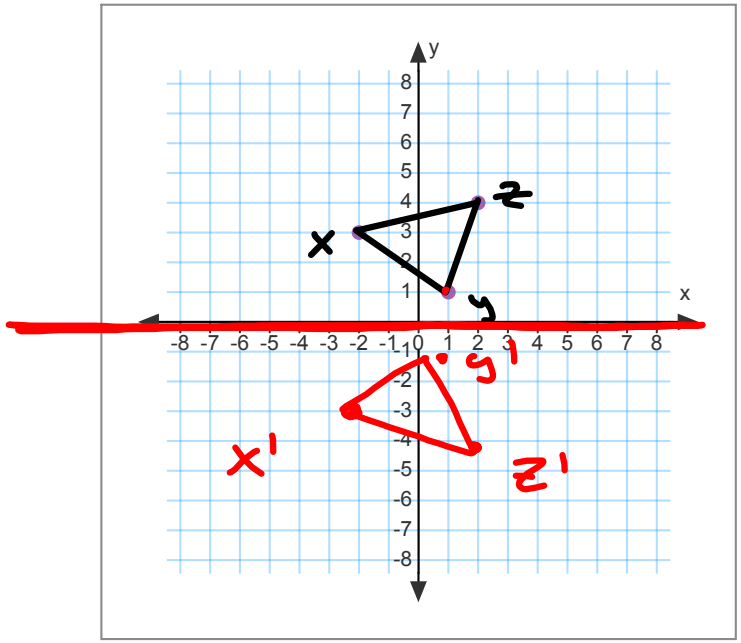
E(-5,6) ⟶ E'(5,6)

Reflection across the line y=x

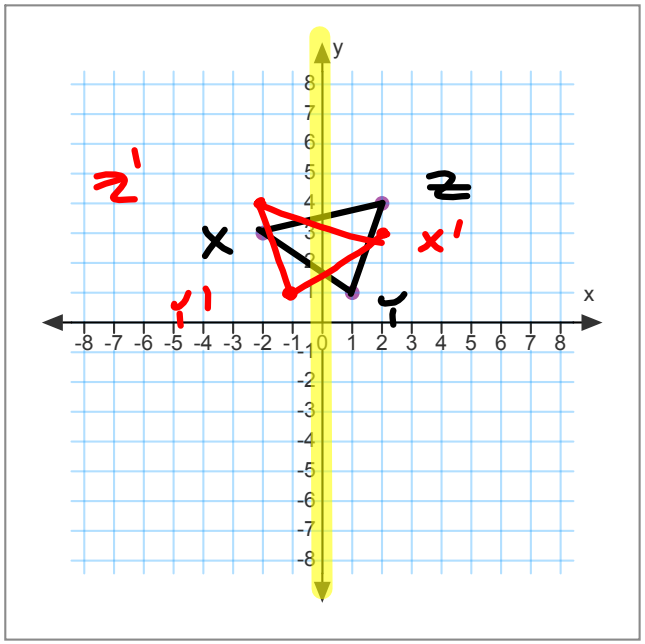
A(3,1) ⟶ A'(1,3)

D(-8,-3) ⟶ D'(-3,-8)

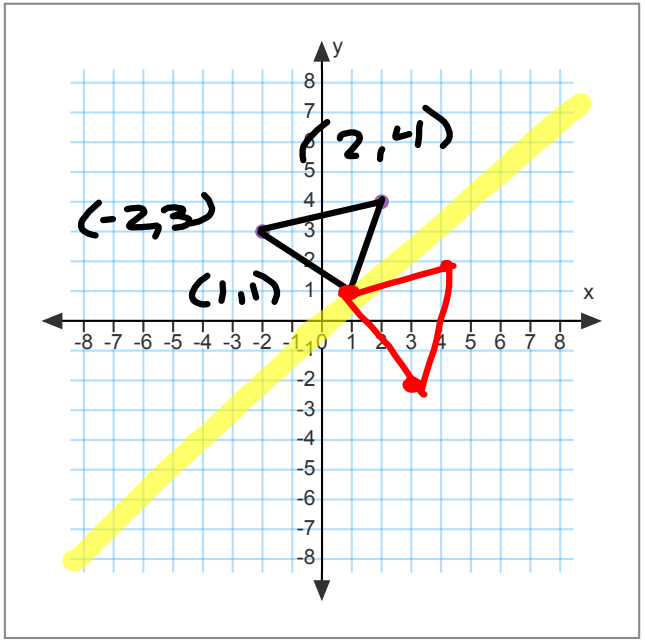
ΔXYZ has vertices X(-2,3), Y(1,1), and Z(2,4). Draw ΔXYZ and its reflection image across the x-axis.



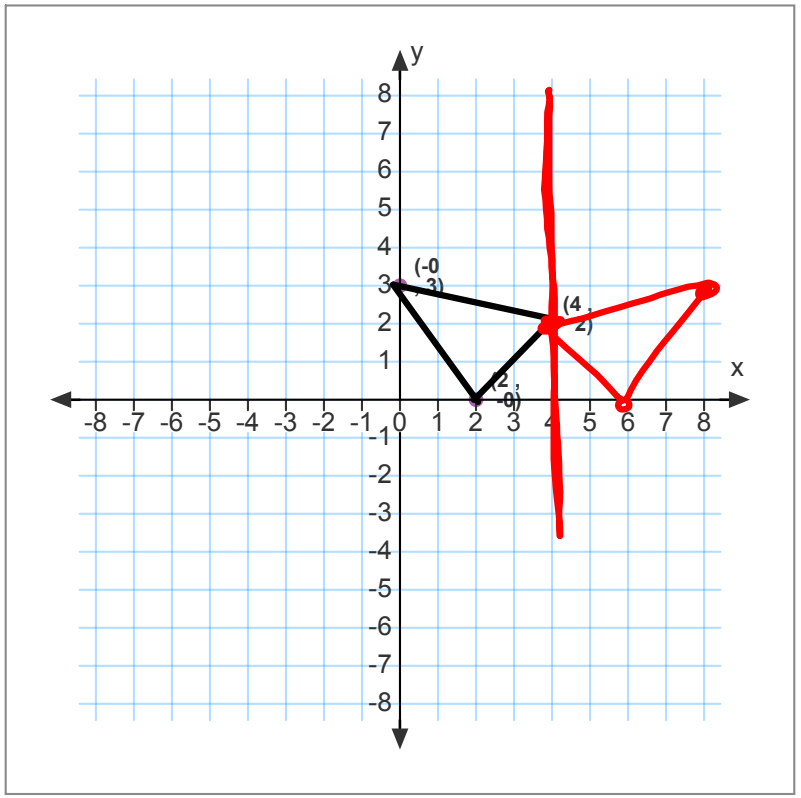
Δ XYZ has vertices X(-2,3), Y(1,1), and Z(2,4). Draw Δ XYZ and its reflection image across the y-axis.



Δ XYZ has vertices X(-2,3), Y(1,1), and Z(2,4). Draw Δ XYZ and its reflection image across the line y = x.



ΔXYZ has vertices X(0, 3), Y(2, 0), and Z(4, 2). Draw ΔXYZ and its reflection image in the line x = 4.



Assignment

pgs 480-482 1-12, 19, 20, 21,47,48

Attachments

Reflection.pdf