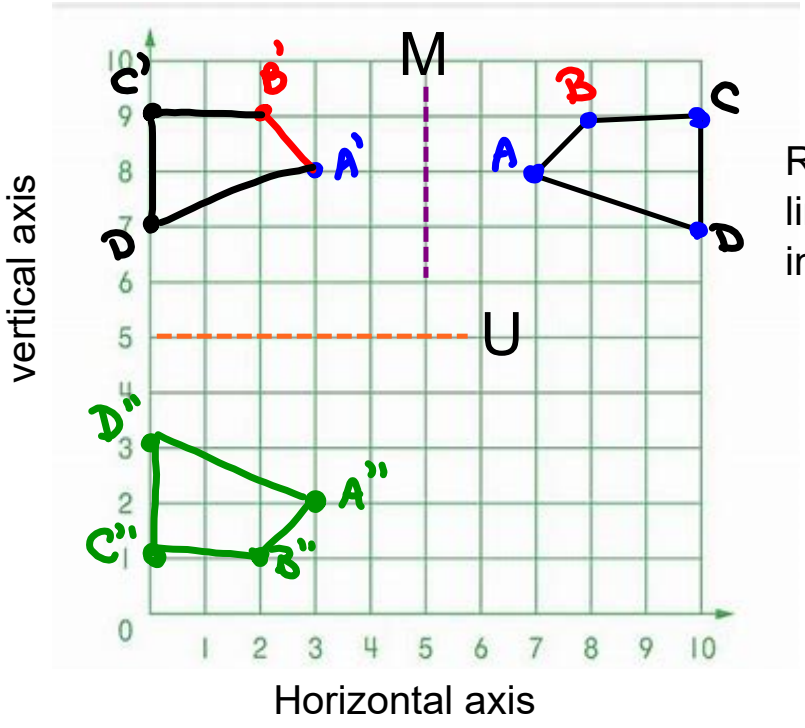
Lesson 3 Day 2

Successive Transformations

Warm Up Grade 6
Ch. 8 Transformations
Date: May 24

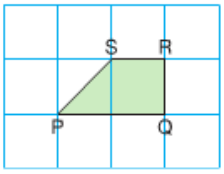



Reflect the shape across line M. Then reflect that image across line U

Solutions Page 306-307 #1, 2

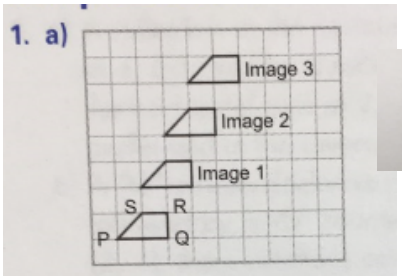
## Practice

You will need grid paper, tracing paper, and a Mira.

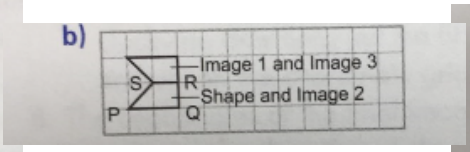



1. Copy this quadrilateral on grid paper. Make:
   a) 3 successive translations of 1 square right and 2 squares up
   b) 3 successive reflections in the line through SR
   c) 3 successive rotations of 180° about vertex R

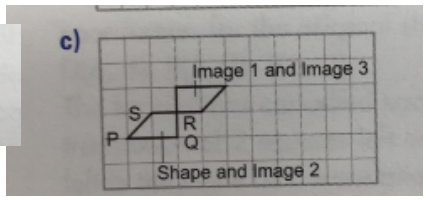
1. a)



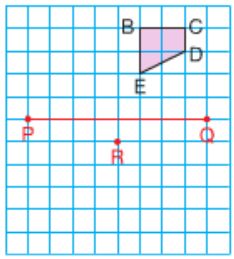

b)



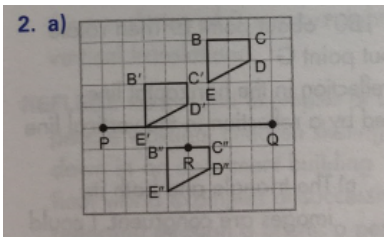

c)



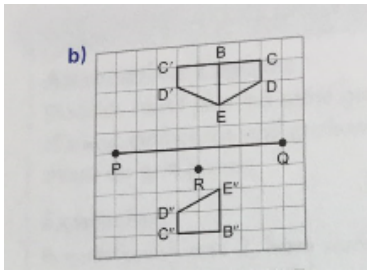

2. Copy this diagram on grid paper.
   Draw and label both images each time.
   a) Translate the quadrilateral 3 squares left and 2 squares down. Then translate the image 1 square right and 3 squares down.
   b) Reflect the quadrilateral in a line through BE. Then reflect the image in the line PQ.
   c) Rotate the quadrilateral 90° counterclockwise about vertex E. Then rotate the image 180° about point R.



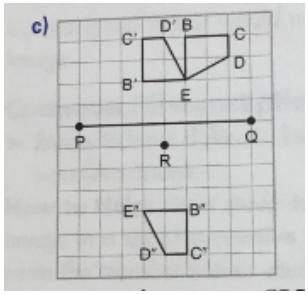

2. a)




b)

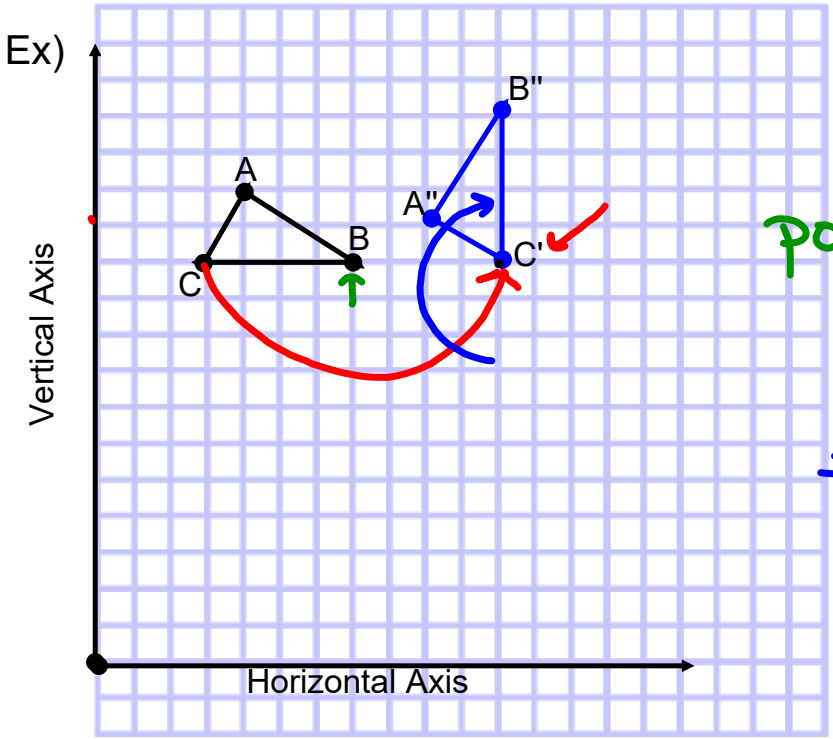



c)



Identify two successive transformation that moved triangle ABC to A"B"C'

Ex)




Point of Rotation is B

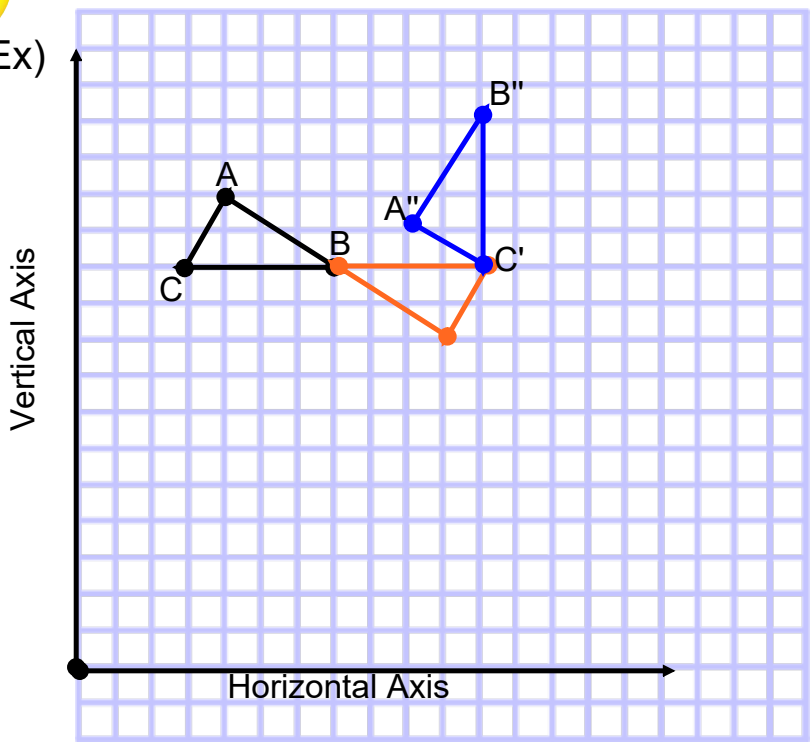
→ Rotate 180°

→ Rotate New image about Point C 180°

Solutions

Identify two transformation that moved triangle ABC to A'B'C'

Ex)




Rotate triangle ABC about point B 2 turns (180 degrees) then rotate new image about C' 1 turn 90 degress clockwise to get

# Class/Homework

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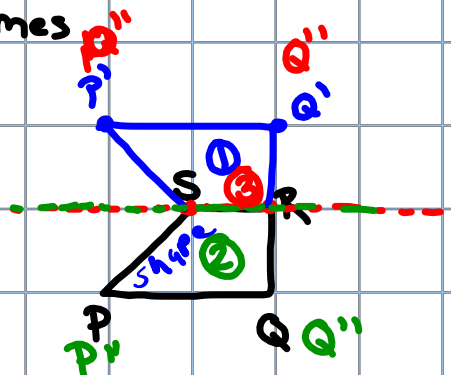
→ TRY 3 (tricky)

b) Reflect 3 times using SR as Mirror



## Practice

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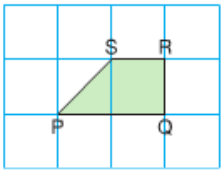


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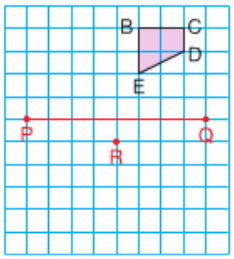
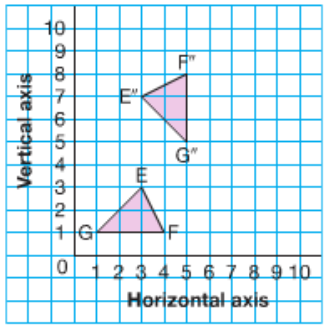
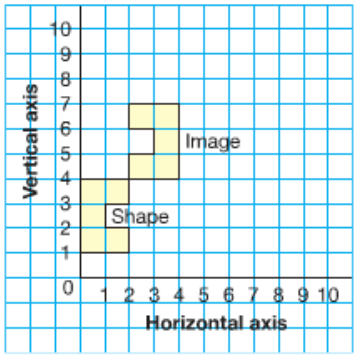



3. Describe two successive transformations that move △EFG to its image, △E″F″G″.
   Show your work.



4. Draw a triangle on grid paper.
   a) Choose two successive translations, reflections, or rotations.
   Apply the first transformation to the triangle.
   Then apply the second transformation to the image.
   b) Label the vertices of each image.
   c) What can you say about the triangle and the images?
   How could you check this?
   d) Describe a single transformation that would move
   the triangle directly to its final image.

5. a) Describe two successive transformations that move the octagon to its image.




   b) Can you find two other successive transformations?
   Explain.

6. The coordinates of a shape are:

| | | |
|---|---|---|
| A(3, 2) | B(3, 6) | C(5, 6) |
| D(6, 4) | E(5, 3) | F(5, 2) |

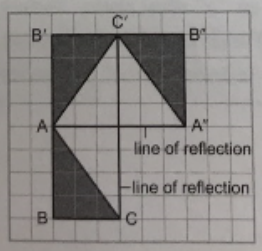
- The shape is translated 3 squares right and 1 square up.
- Then, the image is translated 2 squares left and 2 squares up.
- Then, the image is translated 1 square left and 3 squares down.

What are the coordinates of the final image?
How have the positions of the vertices of the shape changed?
Explain.

3. For example, rotate △EFG 180° about point E. Then rotate △EF′G′ 90° clockwise about point G′.

4. a) For example, I chose a reflection in the horizontal line through vertex A, followed by a reflection in the vertical line through vertex C′.

b)




c) The triangle and both its images are congruent. I could check by tracing the original triangle and superimposing it on each image to see that they match exactly.

d) A 180° rotation about the point 4 squares up from vertex C

5. a) A reflection in the horizontal line through the vertical axis at 4, followed by a reflection in the vertical line through the horizontal axis at 2; these reflections can also be performed in the reverse order.

b) A 90° counterclockwise rotation about point (2, 4), followed by a 90° counterclockwise rotation about point (2, 4); these rotations could also be performed in a clockwise direction, but the first image would not be entirely on the coordinate grid.

6. The coordinates of the final image are the same as the coordinates for the original shape: A(3, 2), B(3, 6), C(5, 6), D(6, 4), E(5, 3), F(5, 2)
The translations cancelled each other out. For example, a translation of 2 squares left and a translation of 1 square left is the same as a translation of 3 squares left. This cancels the translation of 3 squares right. The same is true for the vertical translations.

**REFLECT:** Real-world examples of successive translations are: people walking, children skating, an elevator going up and down in an apartment building
Real-world examples of successive reflections are: light reflecting through a prism; a person going through a mirror house at a carnival; an elevator with mirrored walls
Real-world examples of successive rotations are: wheels in motion on a car; the turntable in a microwave as food heats; a top as it spins.