Geometry

9.5 Apply Compositions of Transformations

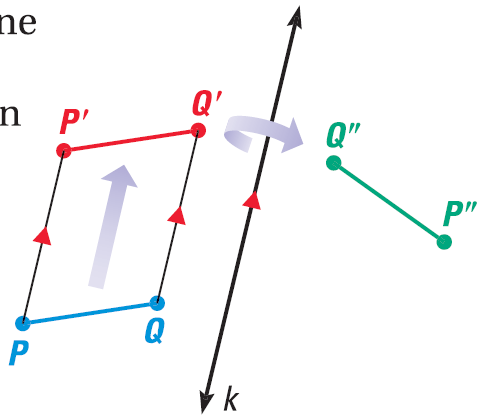
# Composition of Transformations

single

combined

more

Two



* \_\_\_\_\_\_ or \_\_\_\_\_\_\_ transformations \_\_\_\_\_\_\_\_\_\_\_\_\_\_ into a \_\_\_\_\_\_\_\_ transformation

## Glide Reflection

reflection

Translation

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ followed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_

The vertices of ΔABC are A(3, 2), B(-1, 3), and C(1, 1). Find the image of ΔABC after the glide reflection.

Translation: (x, y) 🡪 (x, y – 4)

Reflection: Over y-axis

New points after translation: A’(3, -2), B’(-1, -1), C’(1, -3)

New points after reflection: A’’(-3, -2), B’’(1, -1), C’’(-1, -3)

## Composition Theorem

isometry

isometries

A composition of two (or more) \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is an \_\_\_\_\_\_\_\_\_\_\_\_.

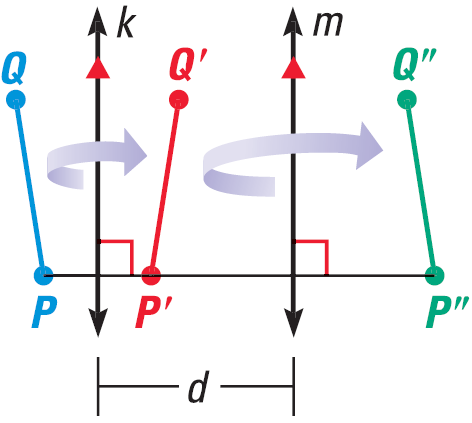
## Reflections in Parallel Lines Theorem

Line m

Line k

reflection

parallel

If lines k and m are \_\_\_\_\_\_\_\_\_\_\_, then a \_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_ followed by a reflection in \_\_\_\_\_\_\_\_ is the same as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

translation

If P’’ is the image of P, then

perpendiculuar

is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to k and m, and

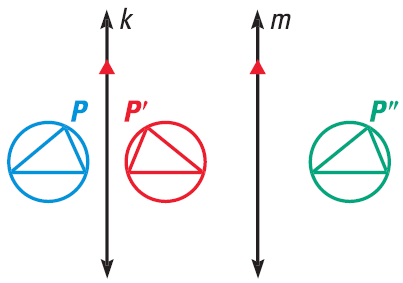
distance

2d

PP’’ = \_\_\_\_\_\_\_\_where d is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between k and m

Use the figure below. The distance between line k and m is 1.6 cm.

1. The preimage is reflected in line k, then in line m. Describe a single transformation that maps the blue figure to the green.

2. What is the distance from P and P’’?

Translation in the x direction

2(1.6 cm) = 3.2 cm (Reflections in Parallel Lines Thrm)

## Reflections in Intersecting Lines Theorem

Line m

Line k

reflection

intersect

If lines k and m \_\_\_\_\_\_\_\_\_\_\_\_ at point P, then a \_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_ followed by a reflection in \_\_\_\_\_\_\_ is the same as a \_\_\_\_\_\_\_\_\_\_\_ about point P.

right

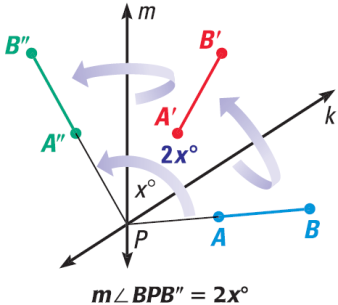
acute

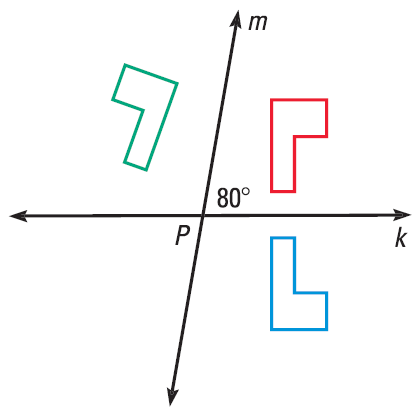
2x°

Angle of rotation

rotation

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is \_\_\_\_\_\_\_, where x° is the measure of the \_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_ angle formed k and m.



In the diagram, the preimage is reflected in line k, then in line m. Describe a single transformation that maps the bottom right figure to the top left.

Counterclockwise rotation of 160° about point P

Assignment: 611 #2-30 even, 40-48 even = 20

Extra Credit: 615 #2, 8 = +2