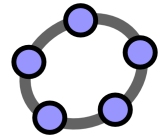


Functions in geometry!



# Isometries

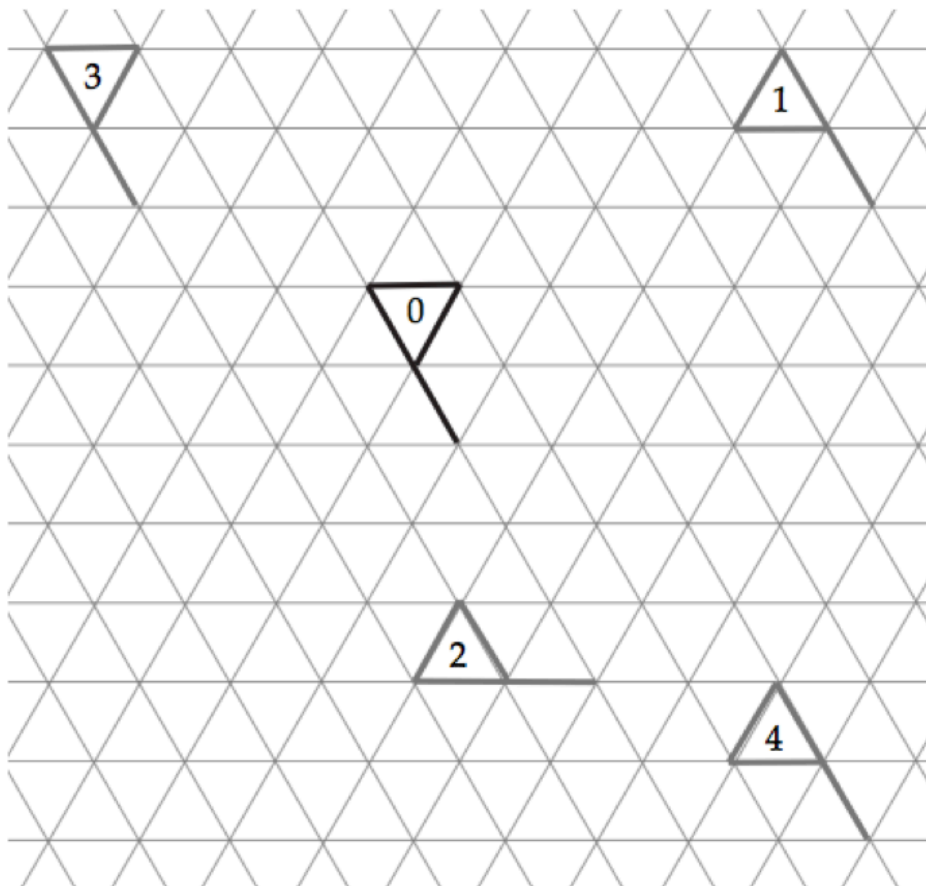
on GeoGebra

kinesthetically

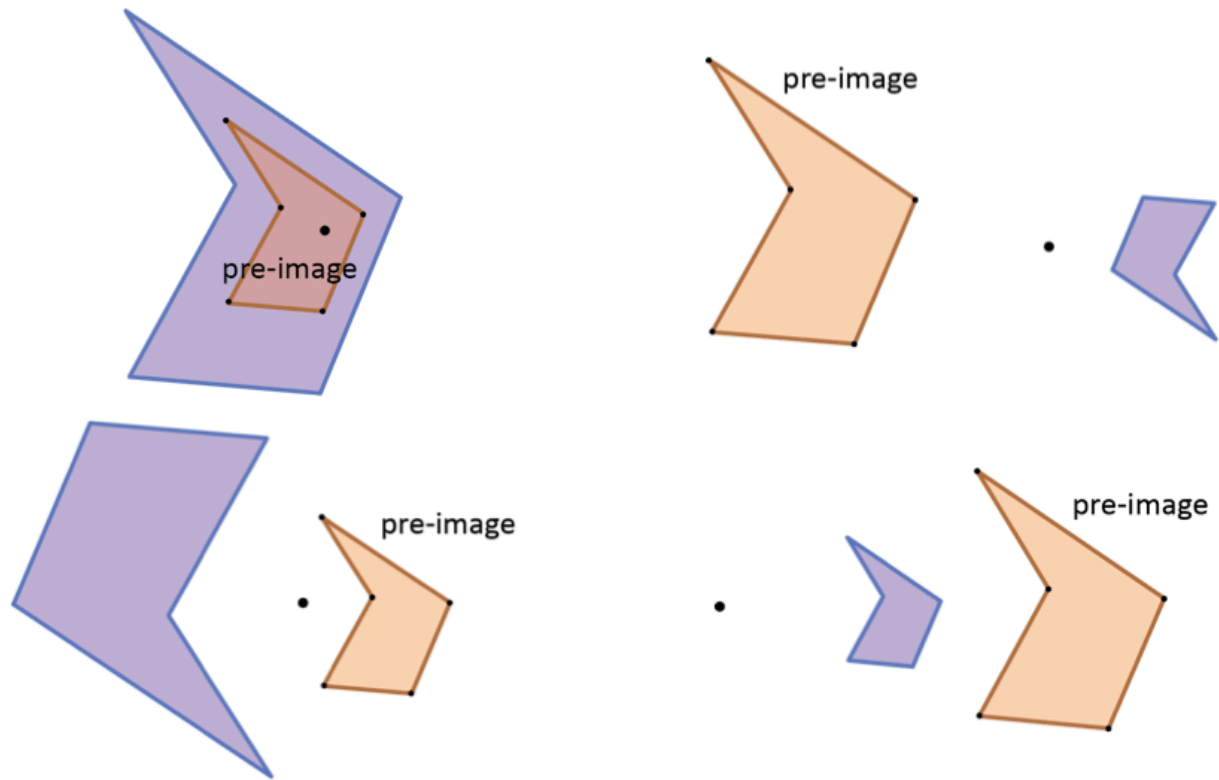
Isometries, pp. 3-4  
(hands on)

Isometries, ~~pp.~~ 5-~~6~~  
(see-through mirrors)

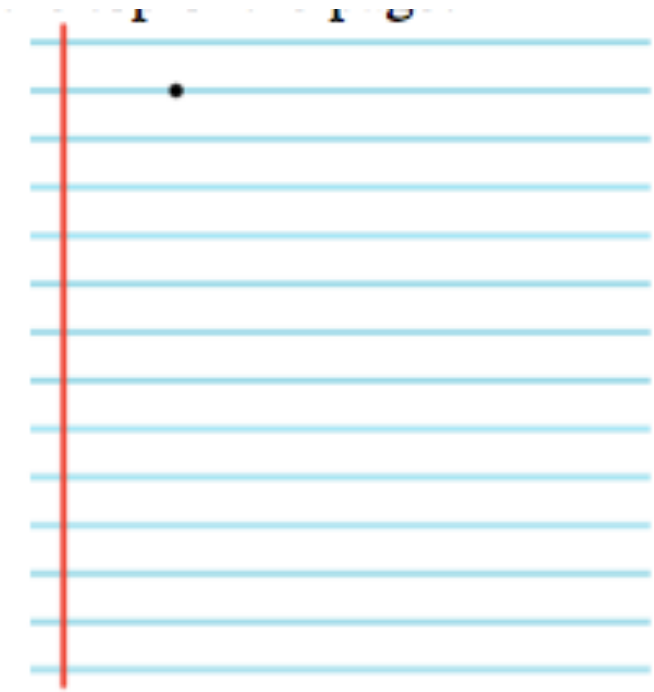
# Isometries, p. 7



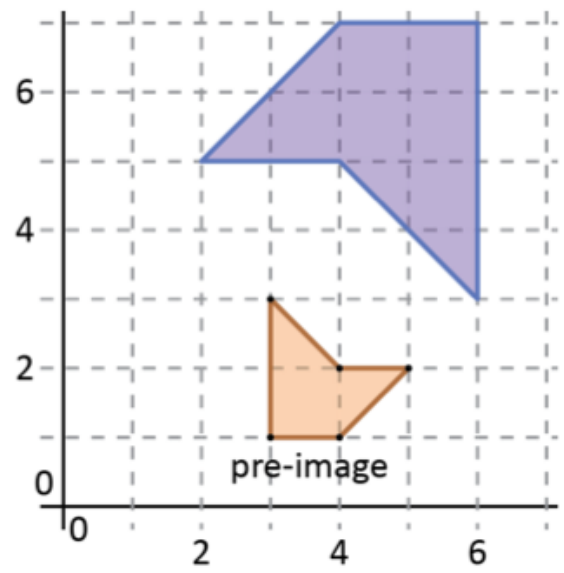
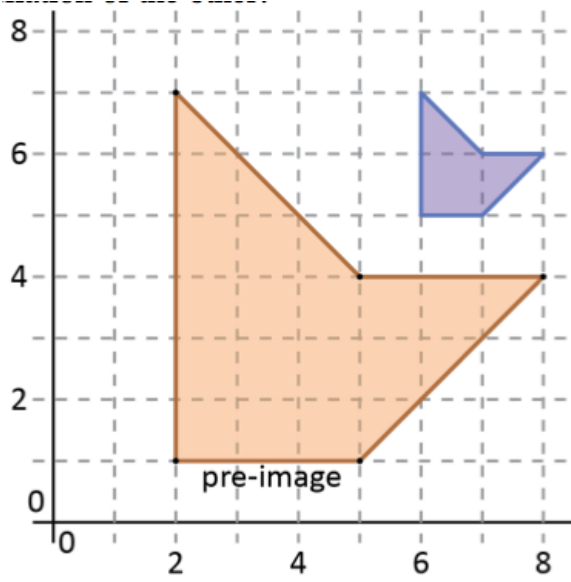
# Dilations pp. 3-4



# Dilation p. 5



# Dilation p. 8



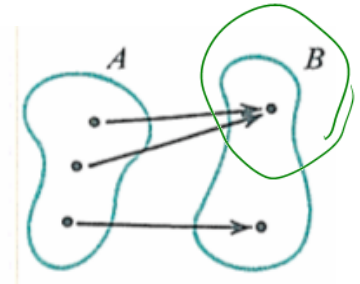
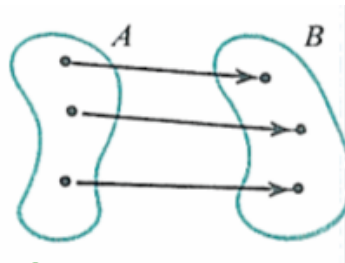


# Geometric Mappings

Review:  
What is a function?  
Function notation

Domain and range  
Inverse function

One-to-one



$f(x)$   
Ref<sub>e</sub> (P)

# Transformation of the plane

Domain: the whole plane

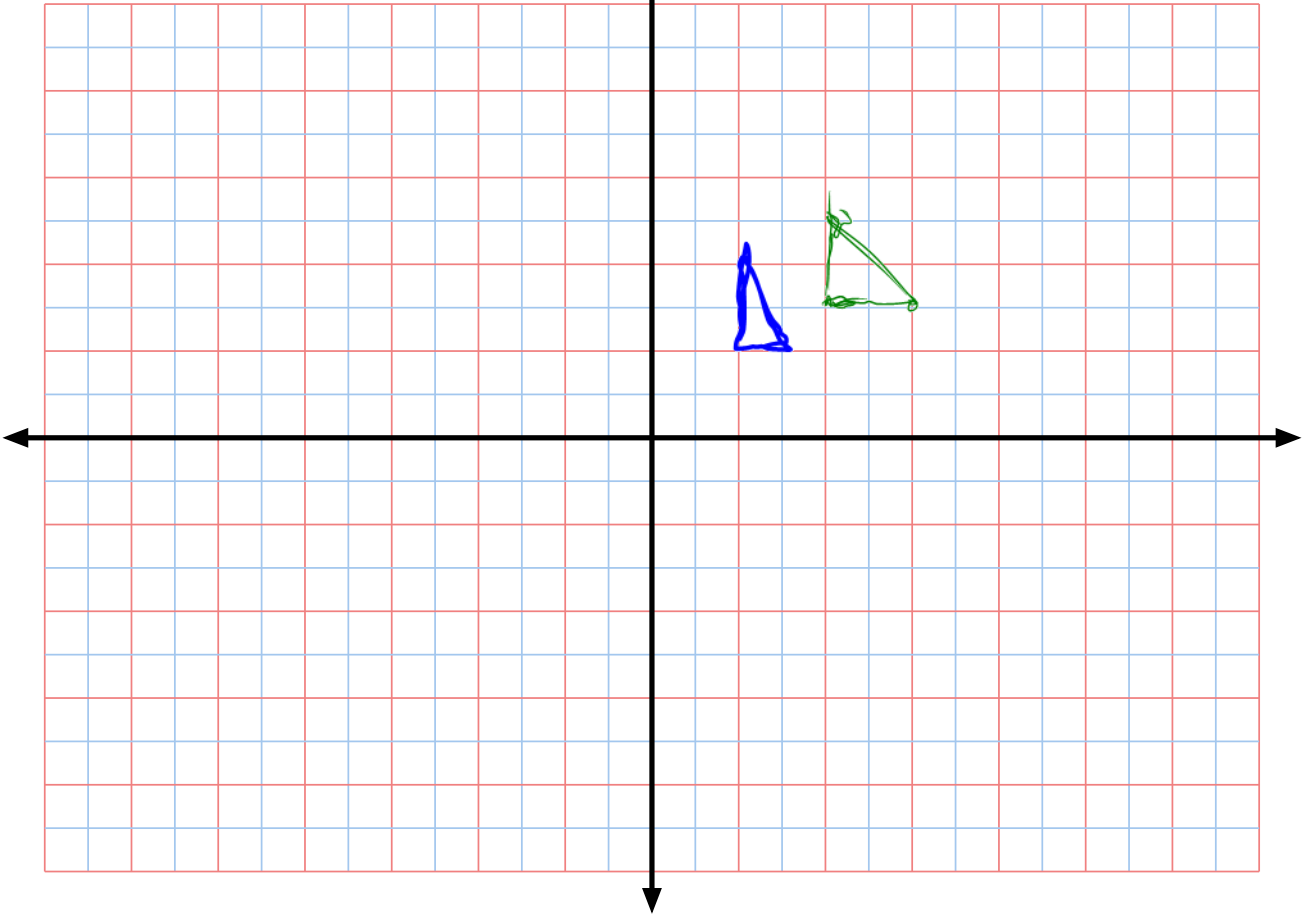
Range: the whole plane

One-to-one

$(x,y) \longrightarrow (2x, y+1)$

pre-image

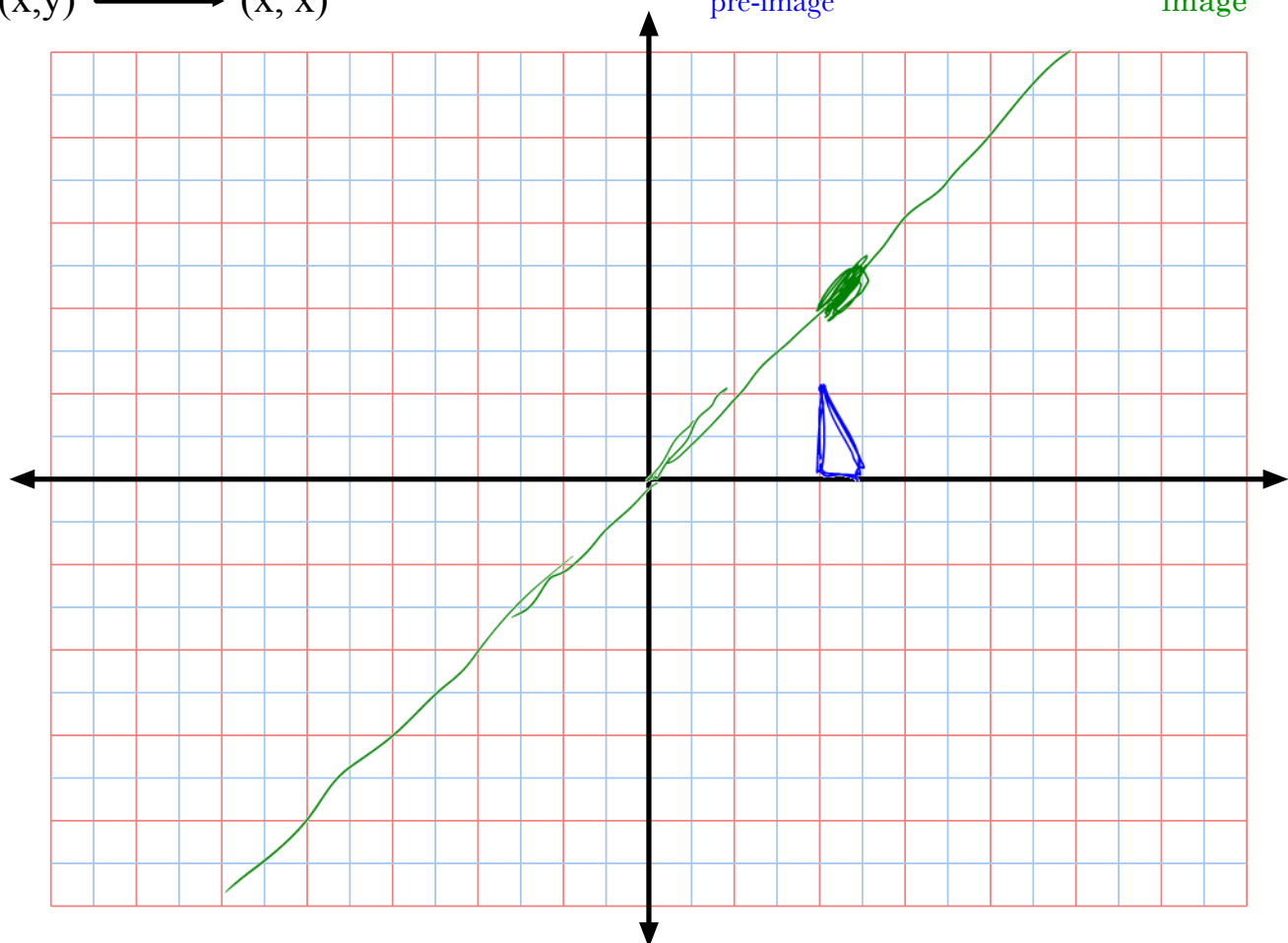
image

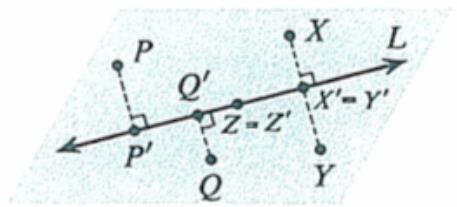
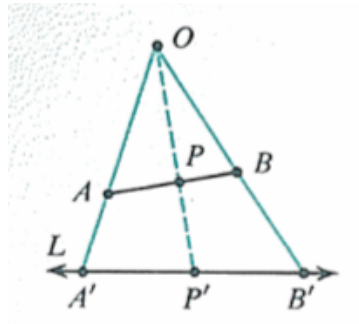


$(x,y) \longrightarrow (x, x)$

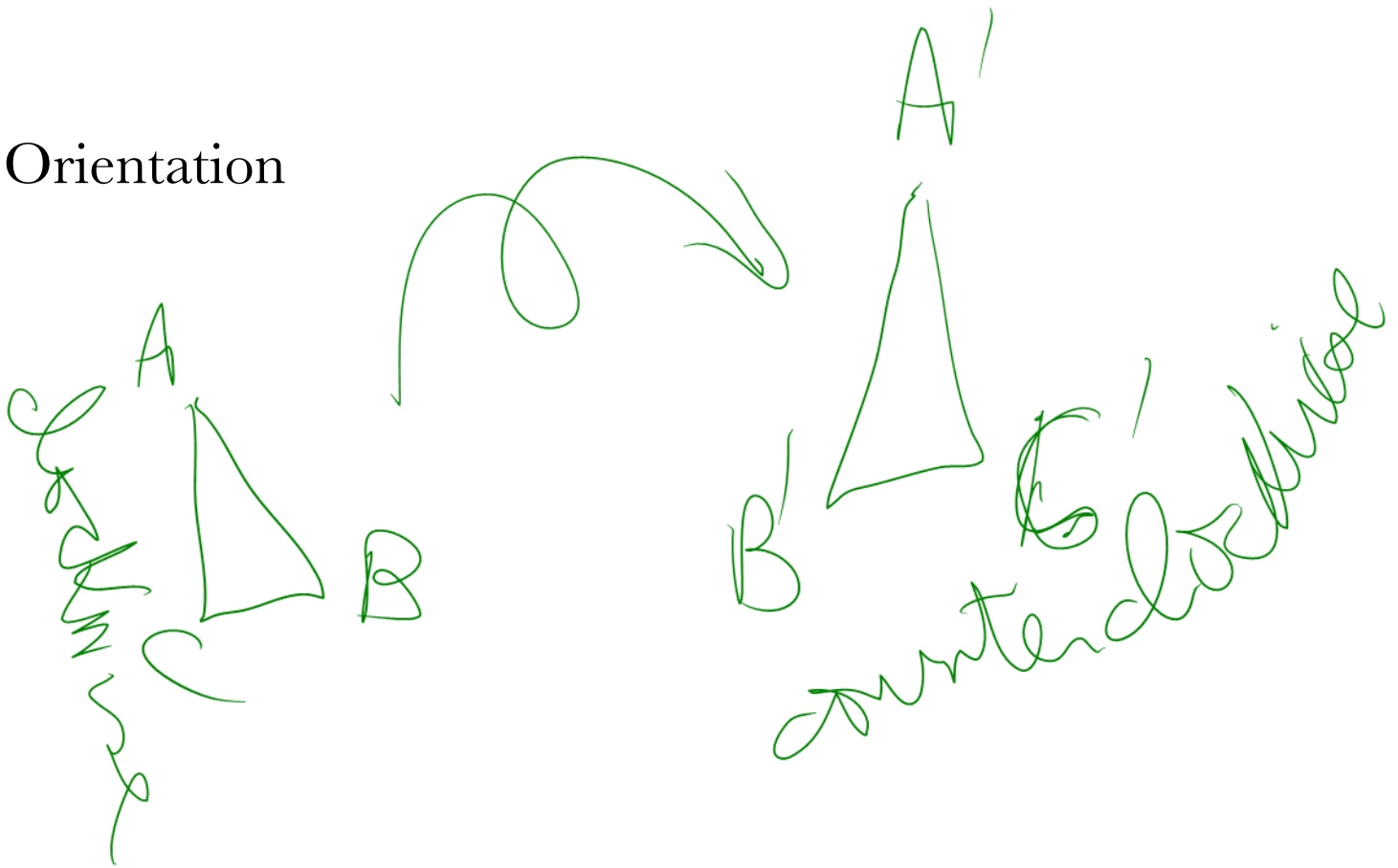
pre-image

image





# Orientation



# What is preserved?

- a. distance
- b. angles
- c. coordinates
- d. collinearity
- e. parallelism
- f. orientation

## Translation

a b d e f

## Rotation

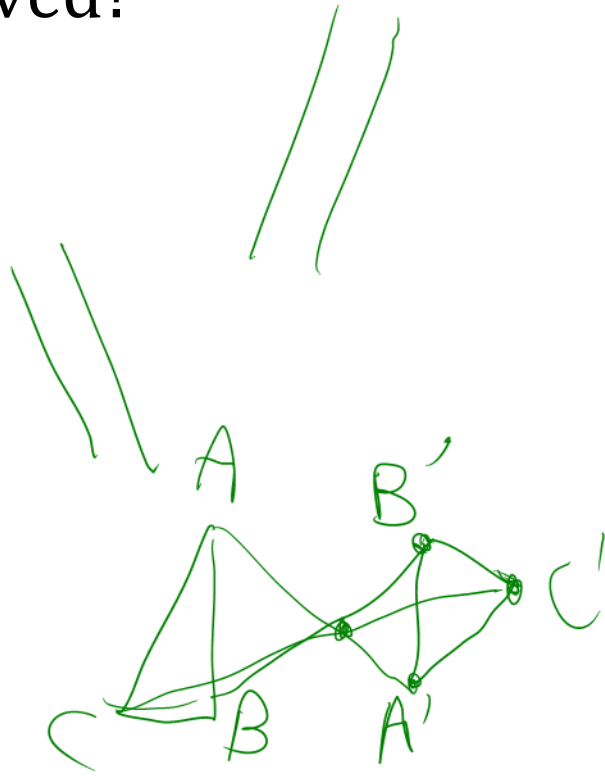
a b d e f

## Reflection

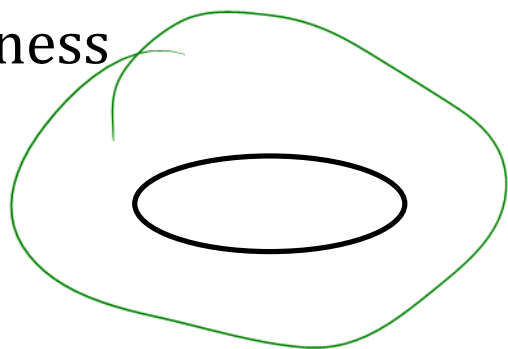
a b d e

## Dilation

b d e f



Handedness





## Fixed points

Transl — none


Rot — the center

Refl — the line of refl.

Dilation — the center

## Invariant sets

Transl: a line // to vector 

Rot: circles centered at the center 

Refl:  $\perp$  lines to the line of refl, circles centered on the line

Dila: lines through the center

# Inverse mappings

Translation, vector  $v$

$$-v$$

Rotation, center  $O$ , angle  $\theta$

$$O, -\theta$$

Reflection, line  $b$

$$\text{Ref in } b$$

Dilation, center  $O$ , scaling factor  $r$

$$O, \frac{1}{r}$$

Isometries of the Plane, pp. 4-5  
(Isometries Specifications)

Isometries of the Plane, p. 6

(Recognizing Isometries)

skip #4

# GeoGebra

basics

transformation tools

Isometries of the Plane, pp. 1-2

(Simulating the Transformation Tools)

(Mystery Isometries)

Find the reflection line

Find the center of rotation

Find the glide reflection line