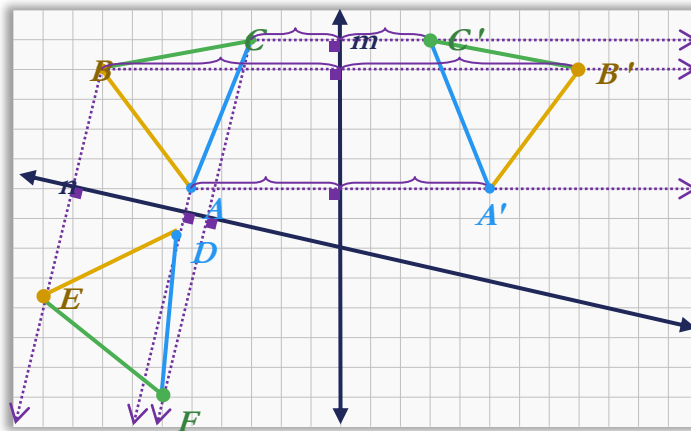To **reflect a geometric figure** means to move the figure's location by flipping.

Definition of a **reflection**: Given a **fixed line *m***, a point P is sent to P^1 so that:
- *the line through P and P^1 is **perpendicular** to **m**, and*
- *the **distance** from P to **m** is **equal** to the **distance** from P^1 to **m**.*

Reflection of <u>triangle ABC</u> **across** <u>line n</u>
geometric figure   fixed line

Triangle DEF is the reflection of triangle ABC across line n.

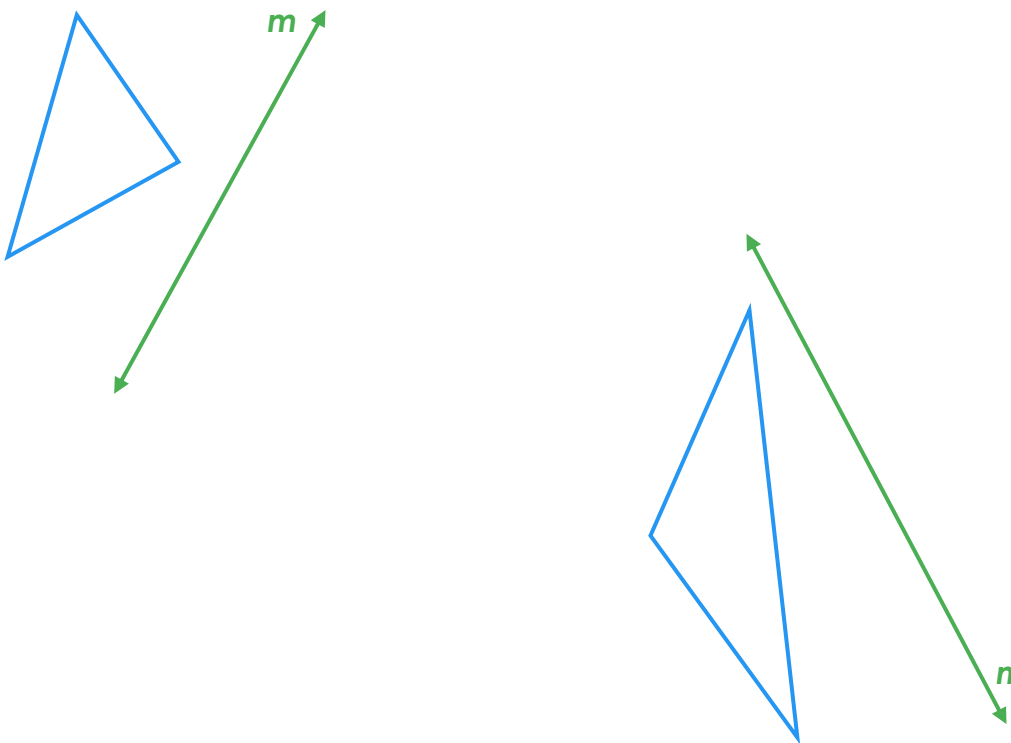List the corresponding points of reflection. (Whiteboard)

A →

B →

C →

Pick one pair of reflected points and verify they satisfy the definition of a reflection.

In your own words, what does it mean to reflect a geometric figure?

1. Identify points of the figure which need to be reflected to re-create the figure.
2. Reflect the points across the fixed line.
    a. Construct the perpendicular path.
    b. Place the reflected point an equal distance away from the fixed line.
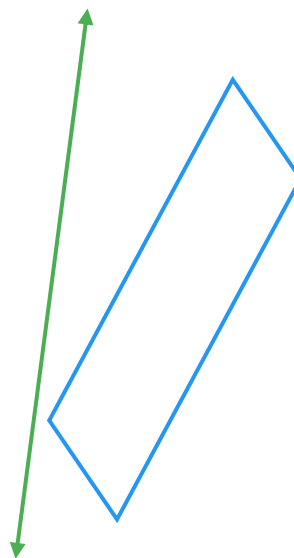3. Re-create the geometric figure using the reflected points.

m

n

Verify the properties. Use measurements from the original and reflected figures if needed.

*"**Line segments** are taken to line segments of the same length."*

_____

_____

*"**Angles** are taken to angles of the same measure."*

_____

_____

_____

*"**Parallel lines** are taken to parallel lines."*

_____

_____

_____

_____

1. Identify points of the figure which need to be reflected to re-create the figure.
2. Reflect the points across the fixed line.
    a. Construct the perpendicular path.
    b. Place the reflected point an equal distance away from the fixed line.
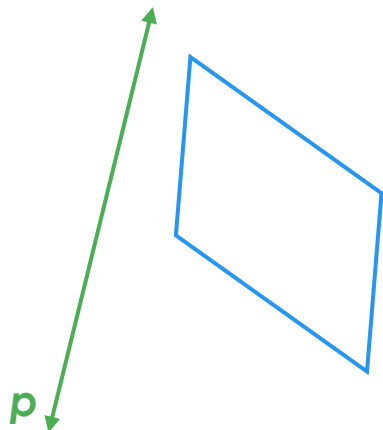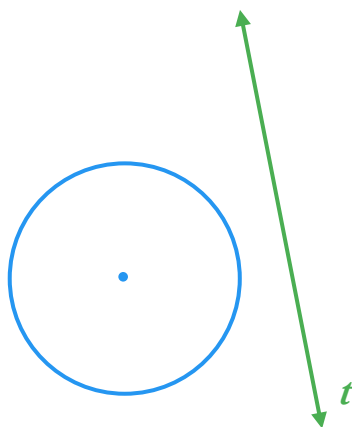3. Re-create the geometric figure using the reflected points.

p

Verify the properties. Use measurements from the original and reflected figures if needed.

*"**Line segments** are taken to line segments of the same length."*

_____

_____

*"**Angles** are taken to angles of the same measure."*

_____

_____

_____

*"**Parallel lines** are taken to parallel lines."*

_____

_____

_____

1. Identify points of the figure which need to be reflected to re-create the figure.
2. Reflect the points across the fixed line.
   a. Construct the perpendicular path.
   b. Place the reflected point an equal distance away from the fixed line.
3. Re-create the geometric figure using the reflected points.
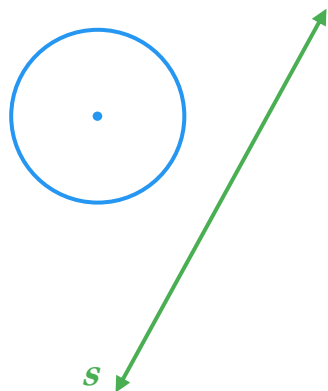
s

t

Verify the properties. Use measurements from the original and reflected figures if needed.

*"**Line segments** are taken to line segments of the same length."*

_____

_____

*"**Angles** are taken to angles of the same measure."*

_____

_____

*"**Parallel lines** are taken to parallel lines."*

_____

_____

_____

Skill Closure

w

Verify the property. Use measurements from the original and reflected figures if needed.

*"**Line segments** are taken to line segments of the same length."*

_____

_____

_____

Concept Closure

Pick a point from the original figure. Describe the process you used to reflect the point across the line.

_____

_____

_____

Closure

What did you learn today about reflecting a geometric figure?

_____

_____

_____

Verify the properties. Use measurements from the original and rotated figures if needed.
*"**Line segments** are taken to line segments of the same length."*

_____

_____

k

*"**Angles** are taken to angles of the same measure."*

_____

_____

*"**Parallel lines** are taken to parallel lines."*
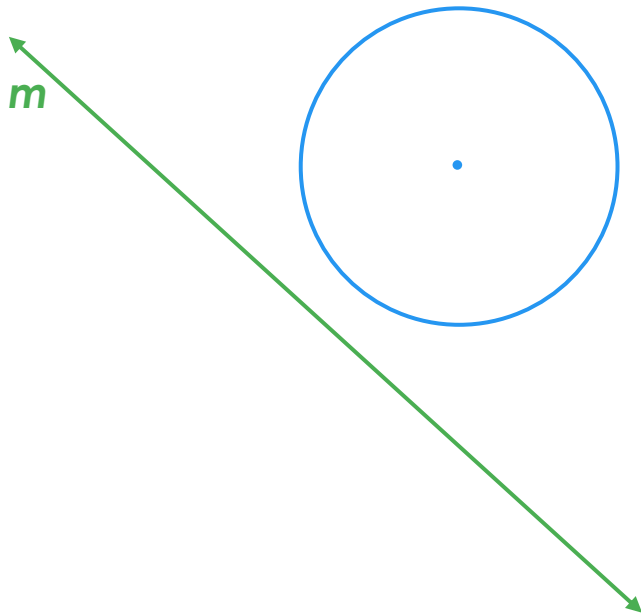
_____

_____

_____

m

Verify the properties. Use measurements from the original and rotated figures if needed.
*"**Line segments** are taken to line segments of the same length."*

_____

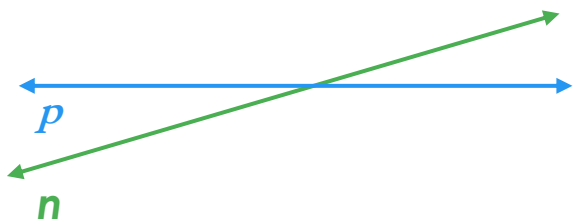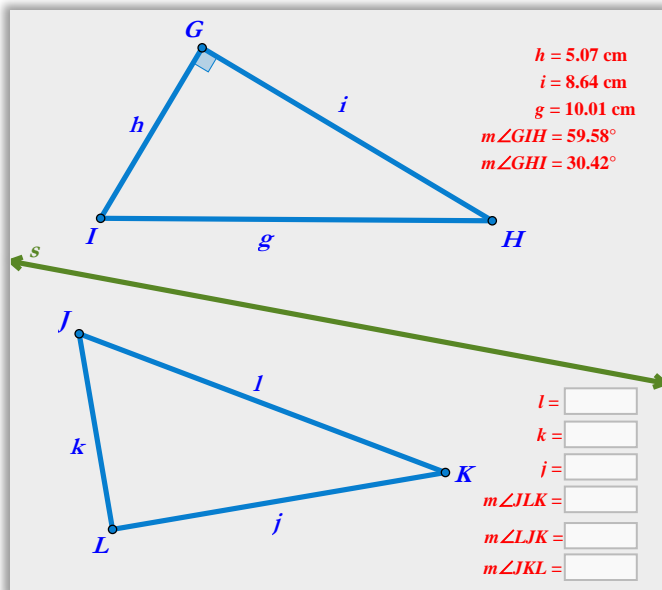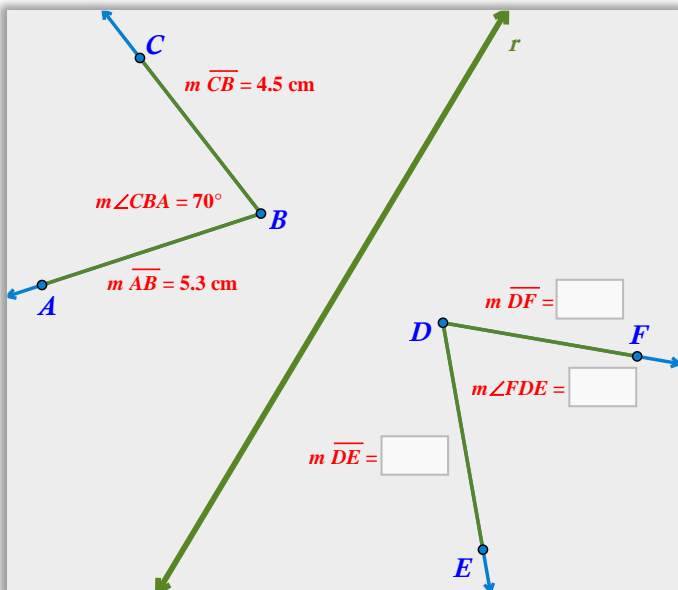*"**Angles** are taken to angles of the same measure."*

_____

*"**Parallel lines** are taken to parallel lines."*

_____

We will reflect geometric figures.

Periodic Review 1

p

n

_____

Find the missing measures of the reflected figures.

C

r

m $\overline{CB}$ = 4.5 cm

m∠*CBA* = 70°

B

m $\overline{AB}$ = 5.3 cm

A

D

m $\overline{DF}$ = [ ]

F

m∠*FDE* = [ ]

m $\overline{DE}$ = [ ]

E

G

h = 5.07 cm
i = 8.64 cm
g = 10.01 cm
m∠*GIH* = 59.58°
m∠*GHI* = 30.42°

h

i

I

g

H

s

J

l

k

K

l = [ ]
k = [ ]
j = [ ]
m∠*JLK* = [ ]
m∠*LJK* = [ ]
m∠*JKL* = [ ]

j

L

Verify the property "*Parallel lines are taken to parallel lines*".

Rotate the parallel lines *r* and *v* 20° about point E.
The points A, B, C, and D all lie on one circle centered at E.


_____

_____

_____
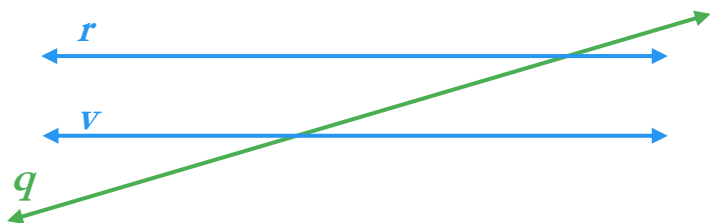
Investigation with geometric software.

1. Construct a geometric figure seen in the lesson (triangle, quadrilaterals, etc.)
2. Reflect the figure across a line.
3. Click and drag the line of reflection and observe how the reflected image is affected.

Describe the reflection if a line segment lies on the line of reflection.

_____

_____

_____

Describe the reflection if the line of reflection passes through the geometric figure.

_____

_____

_____

Reflect the figure across your own fixed line of reflection.

_____

_____

_____
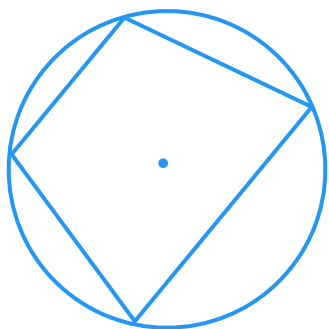
Below are pairs of congruent figures. Can the congruence of the two figures be shown with a single reflection? If so, construct the line of reflection.