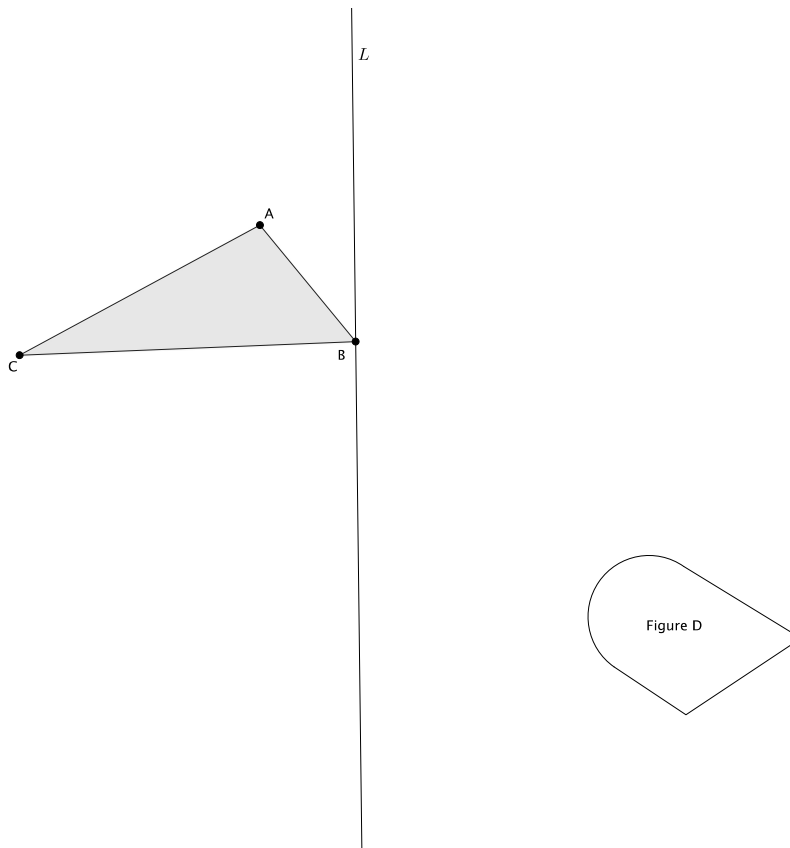


Lesson 4: Definition of Reflection and Basic Properties

Classwork

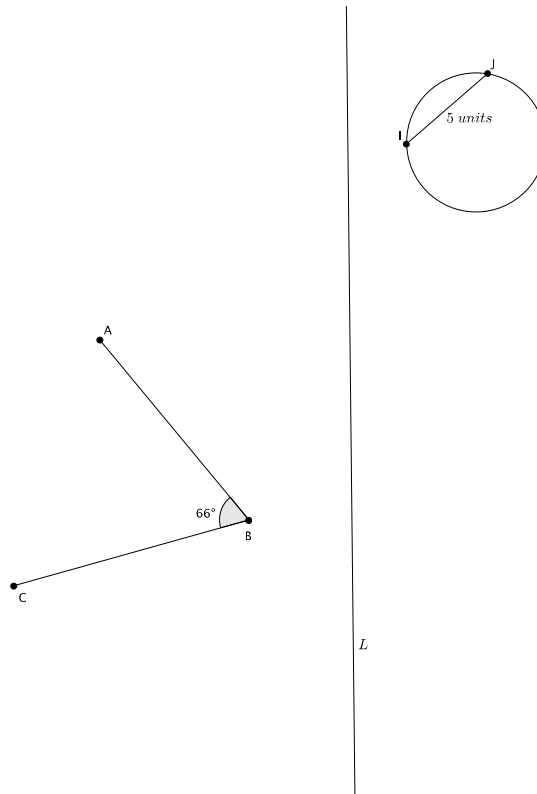
Exercises

1. Reflect $\triangle ABC$ and Figure D across line L . Label the reflected images.



2. Which figure(s) were not moved to a new location on the plane under this transformation?

3. Reflect the images across line L . Label the reflected images.



4. Answer the questions about the image above.

a. Use a protractor to measure the reflected $\angle ABC$.

b. Use a ruler to measure the length of image of IJ after the reflection.

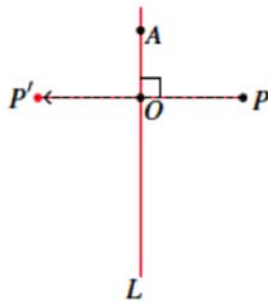
Basic Properties of Reflections:

(Reflection 1) A reflection maps a line to a line, a ray to a ray, a segment to a segment, and an angle to an angle.

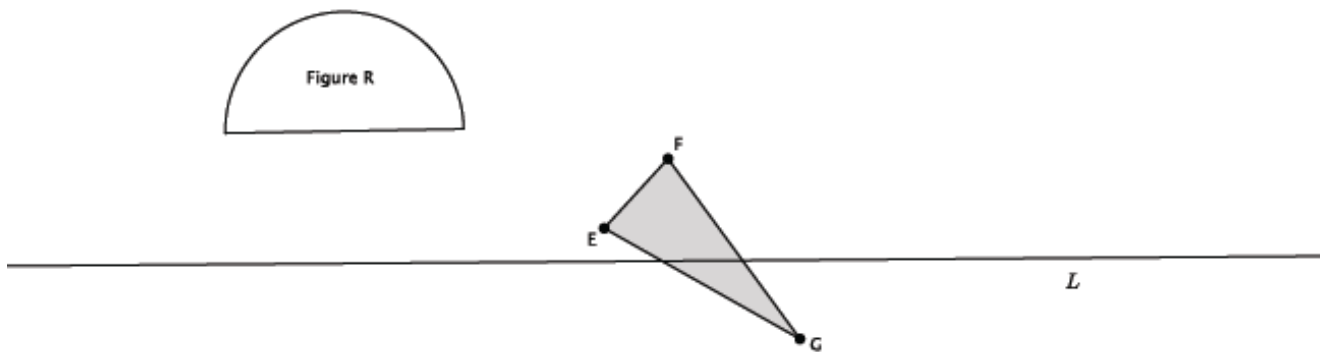
(Reflection 2) A reflection preserves lengths of segments.

(Reflection 3) A reflection preserves degrees of angles.

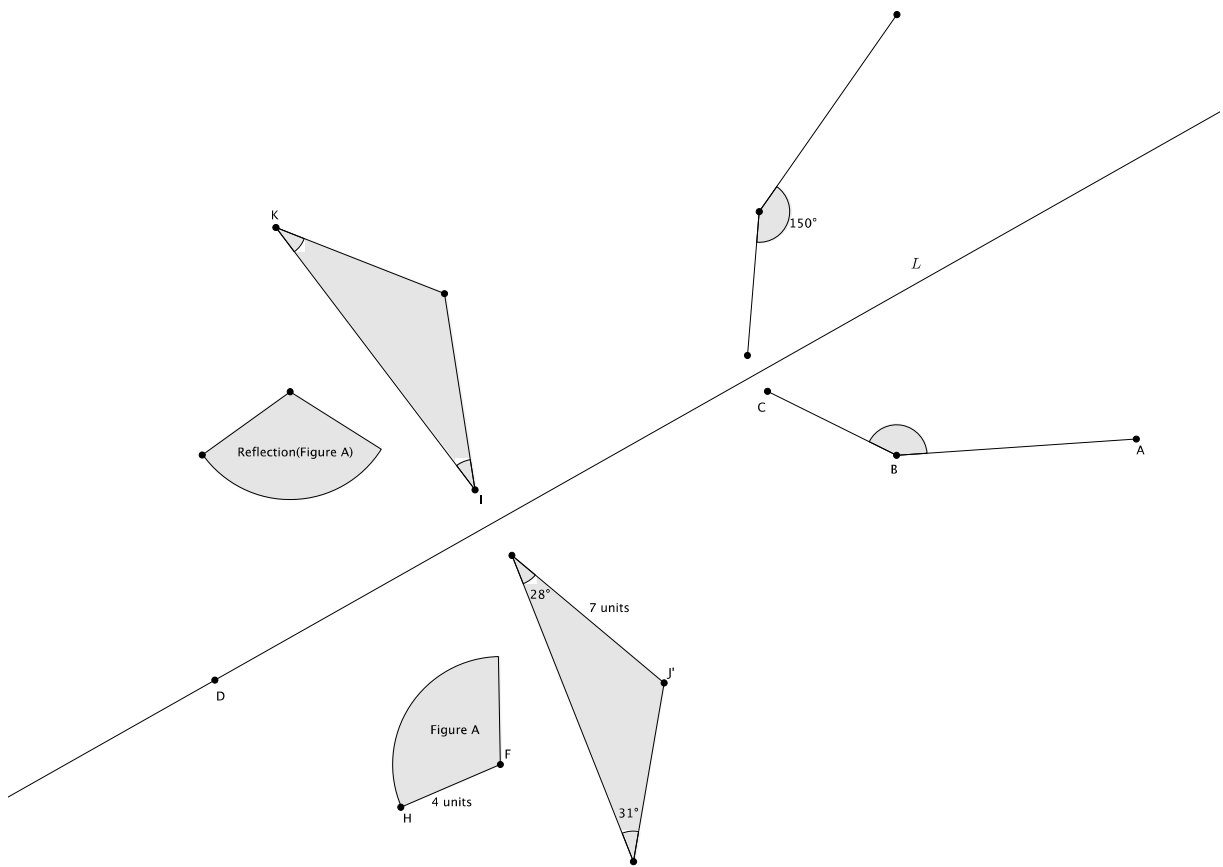
If the reflection is across a line L and P is a point not on L , then L bisects the segment PP' , joining P to its reflected image P' . That is, the lengths of OP and OP' are equal.



5. Reflect Figure R and $\triangle EFG$ across line L . Label the reflected images.



Use the picture below for Exercises 6–9.



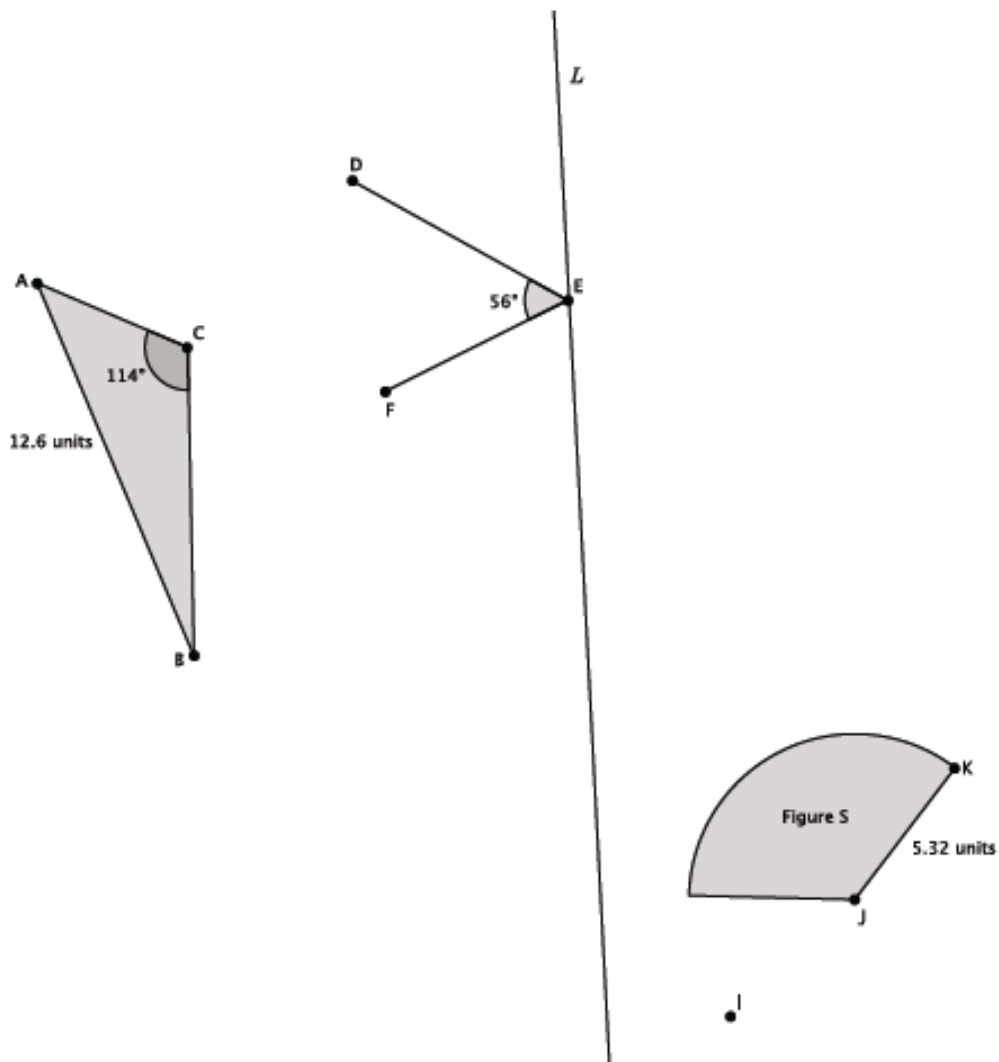
6. Use the picture to label the unnamed points.
7. What is the measure of $\angle JKI$? $\angle KIJ$? $\angle ABC$? How do you know?
8. What is the length of segment $Reflection(FH)$? IJ ? How do you know?
9. What is the location of $Reflection(D)$? Explain.

Lesson Summary

- A reflection is another type of basic rigid motion.
- Reflections occur across lines. The line that you reflect across is called the line of reflection.
- When a point, P , is joined to its reflection, P' , the line of reflection bisects the segment, PP' .

Problem Set

1. In the picture below, $\angle DEF = 56^\circ$, $\angle ACB = 114^\circ$, $AB = 12.6$ units, $JK = 5.32$ units, point E is on line L and point I is off of line L . Let there be a reflection across line L . Reflect and label each of the figures, and answer the questions that follow.



2. What is the size of $\text{Reflection}(\angle DEF)$? Explain.
3. What is the length of $\text{Reflection}(JK)$? Explain.
4. What is the size of $\text{Reflection}(\angle ACB)$?
5. What is the length of $\text{Reflection}(AB)$?
6. Two figures in the picture were not moved under the reflection. Name the two figures and explain why they were not moved.
7. Connect points I and I' . Name the point of intersection of the segment with the line of reflection point Q . What do you know about the lengths of segments IQ and QI' ?