Lesson 4: Definition of Reflection and Basic Properties

Classwork

**Exercises**

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



1. Which figure(s) were not moved to a new location on the plane under this transformation?
2. Reflect the images across line $L$. Label the reflected images.



1. Answer the questions about the image above.
	1. Use a protractor to measure the reflected $∠ABC$. What do you notice?
	2. Use a ruler to measure the length of $IJ $and the length of the image of $IJ$ after the reflection. What do you notice?
2. Reflect Figure $R$ and $∆EFG$ across line $L$. Label the reflected images.



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 measures 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.

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Use the picture below for Exercises 6–9.



1. Use the picture to label the unnamed points.
2. What is the measure of $∠JKI$? $∠KIJ$? $∠ABC$? How do you know?
3. What is the length of segment $Reflection(FH)$? $IJ$? How do you know?
4. 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, $∠DEF=56°$, $∠ACB=114°$, $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.



1. What is the measure of $Reflection(∠DEF)$? Explain.
2. What is the length of $Reflection(JK)$? Explain.
3. What is the measure of $Reflection(∠ACB)$?
4. What is the length of $Reflection(AB)$?
5. Two figures in the picture were not moved under the reflection. Name the two figures and explain why they were not moved.
6. 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 $QI'$?