Lesson 8: Similarity

Classwork

**Example 1**

In the picture below, we have a triangle $ABC$ that has been dilated from center $O$ by a scale factor of $r=\frac{1}{2}$. It is noted by $A'B'C'$. We also have triangle $A''B''C'',$ which is congruent to triangle $A'B'C'$ (i.e., $△A'B'C'≅△A''B''C''$).

Describe the sequence that would map triangle $A''B''C''$ onto triangle $ABC.$

Exercises 1–4

1. Triangle $ABC$was dilated from center $O$ by scale factor $r=\frac{1}{2}$. The dilated triangle is noted by $A'B'C'$*.* Another triangle $A''B''C''$is congruent to triangle $A'B'C'$(i.e., $△A''B''C''≅△A'B'C'$). Describe a dilation followed by the basic rigid motion that would map triangle $A''B''C''$onto triangle$ABC$.



1. Describe a sequence that would show $△ABC\~△A^{'}B^{'}C^{'}.$
2. Are the two triangles shown below similar? If so, describe a sequence that would prove $△ABC\~△A'B'C'$. If not, state how you know they are not similar.
3. Are the two triangles shown below similar? If so, describe a sequence that would prove $△ABC\~△A'B'C'$. If not, state how you know they are not similar.



Lesson Summary

Similarity is defined as mapping one figure onto another as a sequence of a dilation followed by a congruence (a sequence of rigid motions).

The notation $△ABC\~△A^{'}B^{'}C^{'} $means that $△ABC$ is similar to $△A'B'C'.$

Problem Set

1. In the picture below, we have a triangle $DEF$ that has been dilated from center $O$ by scale factor $r=4$. It is noted by $D'E'F'$*.* We also have a triangle $D''E''F''$, which is congruent to triangle $D'E'F'$ (i.e., $△D'E'F'≅△D''E''F''$). Describe the sequence of a dilation, followed by a congruence (of one or more rigid motions ) that would map triangle $D''E''F''$ onto triangle $DEF$.
2. Triangle $ABC$was dilated from center $O$ by scale factor $r=\frac{1}{2}$. The dilated triangle is noted by $A'B'C'$*.* Another triangle $A''B''C''$is congruent to triangle $A'B'C'$ *(*i.e., $△A''B''C''≅△A'B'C')$. Describe the dilation followed by the basic rigid motions that would map triangle $A''B''C''$onto triangle$ABC$.
3. Are the two figures shown below similar? If so, describe a sequence that would prove the similarity. If not, state how you know they are not similar.
4. Triangle $ABC$ is similar to triangle $A'B'C'$ (i.e., $△ABC\~△A'B'C'$). Prove the similarity by describing a sequence that would map triangle $A'B'C'$ onto triangle $ABC$*.*
5. Are the two figures shown below similar? If so, describe a sequence that would prove $△ABC\~△A'B'C'$. If not, state how you know they are not similar.
6. Describe a sequence that would show $△ABC\~△A^{'}B^{'}C^{'}.$

