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10.x Geometry

10 February 2022

Overlapping Similar Triangles: A Reflection and Dilation

A common configuration for two similar triangles is to share a common vertex but be mirror images of each other. Such a situation was constructed in Geogebra by reflecting triangle *ABC* across the angle bisector of angle *A* and then dilating the resulting triangle by a scale factor of 1.5, yielding triangle *A"B"C"*, shown below in Figure 1.

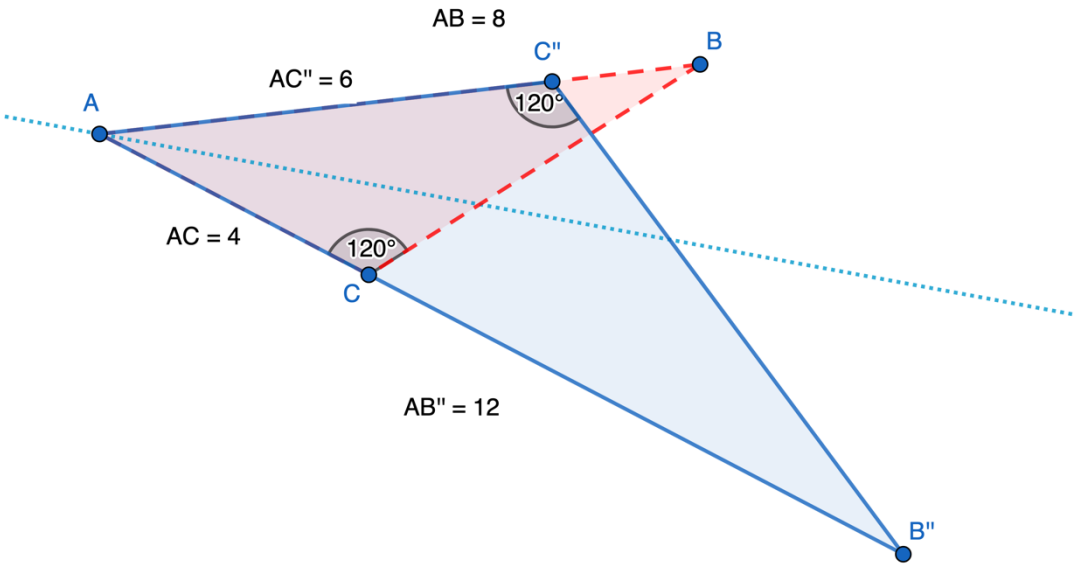

Figure 1: Two overlapping similar triangles showing the lengths of corresponding sides

Corresponding angles are congruent, $\angle ACB \cong \angle AC''B''$, and $\angle A \cong \angle A$, by the reflexive property, so the two triangles are similar by *AA* Similarity, $\Delta ABC \cong \Delta AB''C''$. The scale factor can be calculated from the ratios of the corresponding sides: $k = \frac{AB"}{AB} = \frac{12}{8} = 1.5$, $\frac{AC"}{AC} = \frac{6}{4} = 1.5$.