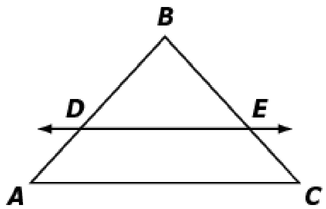
MAFS.912.G-SRT.1.3 Also assesses MAFS.912.G-SRT.2.4	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar. Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity*.
Item Types	Equation Editor – May require creating an algebraic description for a transformation. GRID – May require constructing a similar triangle. Hot Text – May require completing a two-column proof. Matching Item – May require choosing properties that will establish the AA criterion for two triangles. Multiple Choice – May require selecting from choices. Multiselect – May require identifying similar triangles. Open Response – May require explaining properties of similar triangles or explaining a proof in a narrative paragraph.
Clarifications	Students will explain using properties of similarity transformations why the AA criterion is sufficient to show that two triangles are similar. Students will use triangle similarity to prove theorems about triangles. Students will prove the Pythagorean theorem using similarity.
Assessment Limit	Items may require the student to be familiar with using the algebraic description $(x, y) \rightarrow (x+a, y+b)$ for a translation, and $(x, y) \rightarrow (kx, ky)$ for a dilation when given the center of dilation. Items may require the student to be familiar with the algebraic description for a 90-degree rotation about the origin, $(x, y) \rightarrow (-y, x)$, for a 180-degree rotation about the origin, $(x, y) \rightarrow (-x, -y)$, and for a 270-degree rotation about the origin, $(x, y) \rightarrow (y, -x)$. Items that use more than one transformation may ask the student to write a series of algebraic descriptions.
Stimulus Attribute	Items may be set in a real-world or mathematical context.
Response Attribute	
Calculator	Neutral

Sample Item	Item Type
	Multiple Choice

Katherine uses $\triangle ABC$, where $\overline{DE} \parallel \overline{AC}$ to prove that a line parallel to one side of a triangle divides the other two sides proportionally. A part of her proof is shown.



Statements	Reasons
1. $\overline{DE} \parallel \overline{AC}$	1. Given
2. $\angle BDE \cong \angle BAC$ and $\angle BED \cong \angle BCA$	2.
3. $\triangle BAC \sim \triangle BDE$	3.
4. $\frac{BA}{BD} = \frac{BC}{BE}$	4.
5. $BA = BD + DA; BC = BE + EC$	5. Segment addition postulate
6.	6.
7.	7.
8.	8. Subtraction property of equality

Which statement completes step 8 of the proof?

Ⓐ $BA - BD = DA$ and $BC - BE = EC$

Ⓑ $AD = BD$ and $CE = BE$

Ⓒ $\frac{BA}{BC} = \frac{DA}{EC}$

Ⓓ $\frac{DA}{BD} = \frac{EC}{BE}$