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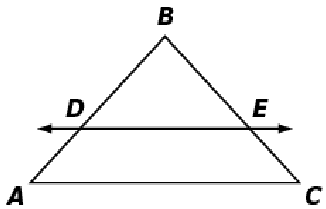
|---|---|
| MAFS.912.G-SRT.1.3<br><br>Also assesses<br>MAFS.912.G-SRT.2.4 | Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.<br><br>Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity*. |
| Item Types | Equation Editor – May require creating an algebraic description for a transformation.<br><br>GRID – May require constructing a similar triangle.<br><br>Hot Text – May require completing a two-column proof.<br><br>Matching Item – May require choosing properties that will establish the AA criterion for two triangles.<br><br>Multiple Choice – May require selecting from choices.<br><br>Multiselect – May require identifying similar triangles.<br><br>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.<br><br>Students will use triangle similarity to prove theorems about triangles.<br><br>Students will prove the Pythagorean theorem using similarity. |
| Assessment Limit | Items may require the student to be familiar with using the algebraic description $(x, y) \to (x+a, y+b)$ for a translation, and $(x, y) \to (kx, ky)$ 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, $(x, y) \to (-y, x)$, for a 180-degree rotation about the origin, $(x, y) \to (-x, -y)$, and for a 270-degree rotation about the origin, $(x, y) \to (y, -x)$. 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 $CE = BE$

Ⓒ $\frac{BA}{BC} = \frac{DA}{EC}$

Ⓓ $\frac{DA}{BD} = \frac{EC}{BE}$