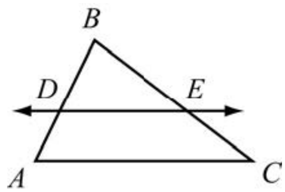
REVIEW EXAMPLES

1. In the triangle shown, $\overline{AC} \parallel \overleftrightarrow{DE}$.



Prove that $\overleftrightarrow{DE}$ divides $\overline{AB}$ and $\overline{CB}$ proportionally.

Solution:

Step	Statement	Justification
1	$\overline{AC} \parallel \overleftrightarrow{DE}$	Given
2	$\angle BDE \cong \angle BAC$	If two parallel lines are cut by a transversal, then corresponding angles are congruent.
3	$\angle DBE \cong \angle ABC$	Reflexive Property of Congruence because they are the same angle
4	$\triangle DBE \sim \triangle ABC$	Angle-Angle (AA) Similarity
5	$\frac{BA}{BD} = \frac{BC}{BE}$	Corresponding sides of similar triangles are proportional.
6	$BD + DA = BA$ $BE + EC = BC$	Segment Addition Postulate
7	$\frac{BD + DA}{BD} = \frac{BE + EC}{BE}$	Substitution
8	$\frac{BD}{BD} + \frac{DA}{BD} = \frac{BE}{BE} + \frac{EC}{BE}$	Rewrite each fraction as a sum of two fractions.
9	$1 + \frac{DA}{BD} = 1 + \frac{EC}{BE}$	Simplify
10	$\frac{DA}{BD} = \frac{EC}{BE}$	Subtraction Property of Equality
11	$\overleftrightarrow{DE}$ divides $\overline{AB}$ and $\overline{CB}$ proportionally.	Definition of proportionality

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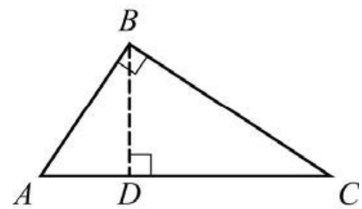
2. Gale is trying to prove the Pythagorean Theorem using similar triangles. Part of her proof is shown below.



Step	Statement	Justification
1	$\angle ABC \cong \angle BDC$	All right angles are congruent.
2	$\angle ACB \cong \angle BCD$	Reflexive Property of Congruence
3	$\triangle ABC \sim \triangle BDC$	Angle-Angle (AA) Similarity
4	$\frac{BC}{DC} = \frac{AC}{BC}$	Corresponding sides of similar triangles are proportional.
5	$BC^2 = AC \bullet DC$	In a proportion, the product of the means equals the product of the extremes.
6	$\angle ABC \cong \angle ADB$	All right angles are congruent.
7	$\angle BAC \cong \angle DAB$	Reflexive Property of Congruence
8	$\triangle ABC \sim \triangle ADB$	Angle-Angle (AA) Similarity
9	$\frac{AB}{AD} = \frac{AC}{AB}$	Corresponding sides of similar triangles are proportional.
10	$AB^2 = AC \bullet AD$	In a proportion, the product of the means equals the product of the extremes.

What should Gale do to finish her proof?

Solution:

Step	Statement	Justification
11	$AB^2 + BC^2 = AC \bullet AD + AC \bullet DC$	Addition Property of Equality
12	$AB^2 + BC^2 = AC(AD + DC)$	Distributive Property
13	$AC = AD + DC$	Segment Addition Postulate
14	$AB^2 + BC^2 = AC \bullet AC$	Substitution
15	$AB^2 + BC^2 = AC^2$	Definition of exponent

$AB^2 + BC^2 = AC^2$ is a statement of the Pythagorean Theorem, so Gale's proof is complete.

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