

Chapter 7: Similarity

SECTION 3: TRIANGLE SIMILARITY (AA, SSS, SAS)

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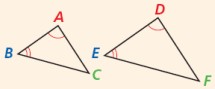
I Can

- Prove if triangles are similar with (AA, SSS and SAS)
- Use triangle similarity to solve problems

Proving Similarity

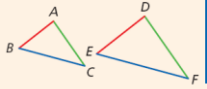
There are several ways to prove certain triangles are similar. The following postulates will be used in proofs just as SSS, SAS, ASA, HL, and AAS were used to prove triangles congruent.

Postulate 7-3-1 Angle-Angle (AA) Similarity

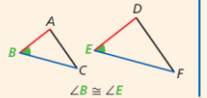
POSTULATE	HYPOTHESIS	CONCLUSION
If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.		$\triangle ABC \sim \triangle DEF$

Proving Similarity

Theorem 7-3-2 Side-Side-Side (SSS) Similarity

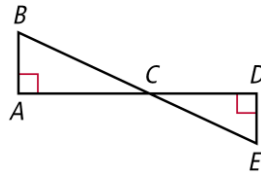
THEOREM	HYPOTHESIS	CONCLUSION
If the three sides of one triangle are proportional to the three corresponding sides of another triangle, then the triangles are similar.		$\triangle ABC \sim \triangle DEF$

Theorem 7-3-3 Side-Angle-Side (SAS) Similarity

THEOREM	HYPOTHESIS	CONCLUSION
If two sides of one triangle are proportional to two sides of another triangle and their included angles are congruent, then the triangles are similar.		$\triangle ABC \sim \triangle DEF$

Example

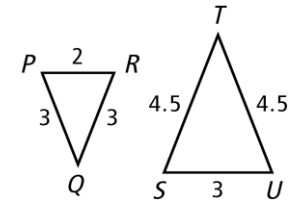
Explain why the triangles are similar and write a similarity statement.



Example

Verify that the triangles are similar.

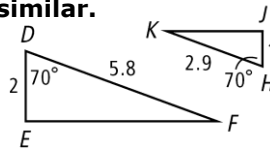
$\triangle PQR$ and $\triangle STU$



Example

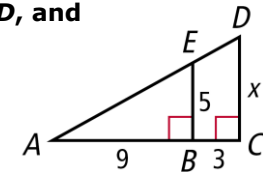
Verify that the triangles are similar.

$\triangle DEF$ and $\triangle HJK$



Example

Explain why $\triangle ABE \sim \triangle ACD$, and then find CD .



Properties

Properties of Similarity

Reflexive Property of Similarity

$\triangle ABC \sim \triangle ABC$ (Reflex. Prop. of \sim)

Symmetric Property of Similarity

If $\triangle ABC \sim \triangle DEF$, then $\triangle DEF \sim \triangle ABC$. (Sym. Prop. of \sim)

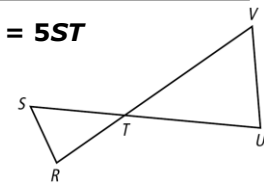
Transitive Property of Similarity

If $\triangle ABC \sim \triangle DEF$ and $\triangle DEF \sim \triangle XYZ$, then $\triangle ABC \sim \triangle XYZ$. (Trans. Prop. of \sim)

PROOFS!!

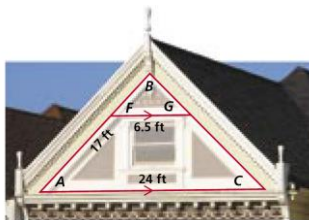
Given: $3UT = 5RT$ and $3VT = 5ST$

Prove: $\triangle UVT \sim \triangle RST$



Example

The photo shows a gable roof. $\overline{AC} \parallel \overline{FG}$.
 $\triangle ABC \sim \triangle FBG$. Find \overline{BA} to the nearest tenth of a foot.



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