LESSON MAKER PRO

Triangle Scale Proofs

Use angle and side facts to prove triangles similar.

HIGH SCHOOL · HSG-SRT.B

CCSS.Math.Content.HSG-SRT.B "Prove theorems involving similarity"

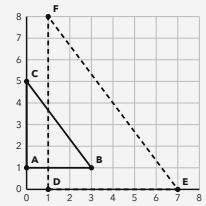
NAME _____ DATE _____

PROVE, THEN SCALE

If two pairs of corresponding angles are congruent, the triangles are similar by AA. If corresponding side ratios are equal, use SSS, or use SAS when the included angles are congruent.

WORKED EXAMPLE

Use the grid. ΔABC and dashed ΔDEF have corresponding horizontal and vertical sides. Prove they are similar and find the scale factor from ΔABC to ΔDEF.



1. AB = 3 and DE = 6.
2. AC = 4 and DF = 8.
3. Corresponding sides are parallel, so two angle pairs are congruent.
4. ΔABC ~ ΔDEF by AA, and 6/3 = 2.

Answer: ΔABC ~ ΔDEF; scale factor 2

PRACTICE 4 problems

1 Two triangles have angle pairs measuring 47° and 68° in each triangle. Are the triangles similar? Name the theorem.

ANSWER _____

2 ΔABC ~ ΔDEF, with AB corresponding to DE and AC corresponding to DF. AB = 7, DE = 35, AC = 9, and DF = x. Find x.

ANSWER _____

3 Triangle JKL has side lengths 11, 13, and 17. Triangle MNP has corresponding side lengths 55, 65, and 85. Prove the triangles are similar.

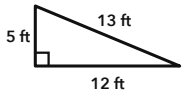
ANSWER _____

4 In ΔRST, RS = 12, ST = 20, and ∠S = 53°. In ΔUVW, UV = 84, VW = 140, and ∠V = 53°. Prove the triangles are similar.

ANSWER _____

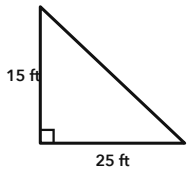
APPLY IT Show your work

1 The small skate-ramp cross-section is shown. A full-size ramp has a base of 60 ft that corresponds to the 12-ft base. Find the full-size rise and ramp length.



ANSWER _____

2 A light stand and its shadow form the right triangle shown. At the same time, a flagpole casts a 35-ft shadow. Find the flagpole's height.



ANSWER _____

CHALLENGE One step up

Triangle ABC has AB = 14, BC = 21, and AC = 28. Triangle DEF has DE = 18, EF = 27, and DF = 36. State the matching vertices and prove whether the triangles are similar.

WORK SPACE AND ANSWER

ANSWER KEY

Triangle Scale Proofs

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Two triangles have angle pairs measuring 47° and 68° in each triangle. Are the triangles similar? Name the theorem.	**Yes; AA similarity.**
2	ΔABC ~ ΔDEF, with AB corresponding to DE and AC corresponding to DF. AB = 7, DE = 35, AC = 9, and DF = x. Find x.	**45**
3	Triangle JKL has side lengths 11, 13, and 17. Triangle MNP has corresponding side lengths 55, 65, and 85. Prove the triangles are similar.	**Yes; 11/55 = 13/65 = 17/85 = 1/5, so the triangles are similar by SSS.**
4	In ΔRST, RS = 12, ST = 20, and ∠S = 53°. In ΔUVW, UV = 84, VW = 140, and ∠V = 53°. Prove the triangles are similar.	**ΔRST ~ ΔUVW by SAS, since 12/84 = 20/140 = 1/7 and ∠S ≅ ∠V.**

PART 2 · APPLY IT

1. **Rise = 25 ft; ramp length = 65 ft** The scale factor is 60/12 = 5. Multiply the shown rise and ramp length by 5.
2. **21 ft** The height-to-shadow ratio is 15/25. Set x/35 = 15/25 and solve for x.

CHALLENGE

A ↔ D, B ↔ E, C ↔ F. Yes, ΔABC ~ ΔDEF by SSS because 14/18 = 21/27 = 28/36 = 7/9.

Accept equivalent proportional ratios and a correct similarity statement with corresponding vertices in matching order. For proof items, students must name AA, SSS, or SAS and show the needed angle or ratio facts.