LESSON MAKER PRO

Triangle Proof Match

Use matching parts to prove triangles congruent or similar.

HIGH SCHOOL · MA.912.GR.1.2

MA.912.GR.1.2 "Prove triangle congruence or similarity using Side-Side-Side, Side-Angle-Side, Angle-Side-Angle, Angle-Angle-Side, Angle-Angle and Hypotenuse-Leg."

NAME _____ DATE _____

CHOOSE THE EVIDENCE

To prove triangles congruent, match corresponding parts using SSS, SAS, ASA, AAS, or HL for right triangles. To prove triangles similar, show two pairs of matching angles, AA. In SAS, the angle must be between the two named sides.

WORKED EXAMPLE

In triangles ABC and DEF, AB = DE = 7, BC = EF = 9, and AC = DF = 11. Prove the triangles congruent.

1. AB = DE, BC = EF, and AC = DF.
2. All three pairs of corresponding sides are equal.
3. Use SSS.

Answer: △ABC ≅ △DEF by SSS.

PRACTICE 5 problems

1 AB = DE = 6, BC = EF = 8, and ∠B = ∠E = 50°. Which theorem proves △ABC ≅ △DEF?

ANSWER _____

2 ∠A = ∠D = 35°, ∠B = ∠E = 65°, and AB = DE = 12. Which theorem proves △ABC ≅ △DEF?

ANSWER _____

3 ∠J = ∠M = 28°, ∠K = ∠N = 74°, and JL = MP = 14. Which theorem proves △JKL ≅ △MNP?

ANSWER _____

4 ∠R = ∠U = 42° and ∠S = ∠V = 68°. What relationship can you prove between △RST and △UVW?

ANSWER _____

5 △GHI and △JKL are right triangles. Their hypotenuses are both 13, and GH = JK = 5. Which theorem proves △GHI ≅ △JKL?

ANSWER _____

APPLY IT Show your work

1 Two right-triangle braces hold up a skateboard ramp. Each brace has a hypotenuse of 17 inches and one leg of 8 inches. Are the braces congruent? State the theorem.

WORK SPACE

ANSWER _____

2 A student makes two triangular graphics for a gaming channel. One triangle has angles 48° and 72°, and the other triangle has matching angles of 48° and 72°. Are the graphics similar? State the theorem.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

In $\triangle ABC$ and $\triangle DEF$, $AB = 2x + 1$, $DE = 17$, $BC = EF = 15$, and $\angle B = \angle E = 62°$. If $AB = DE$, find x and prove the triangles congruent.

_____

_____

ANSWER KEY

Triangle Proof Match

HIGH SCHOOL · MA.912.GR.1.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	AB = DE = 6, BC = EF = 8, and ∠B = ∠E = 50°. Which theorem proves △ABC ≅ △DEF?	**SAS**
2	∠A = ∠D = 35°, ∠B = ∠E = 65°, and AB = DE = 12. Which theorem proves △ABC ≅ △DEF?	**ASA**
3	∠J = ∠M = 28°, ∠K = ∠N = 74°, and JL = MP = 14. Which theorem proves △JKL ≅ △MNP?	**AAS**
4	∠R = ∠U = 42° and ∠S = ∠V = 68°. What relationship can you prove between △RST and △UVW?	**△RST ~ △UVW by AA.**
5	△GHI and △JKL are right triangles. Their hypotenuses are both 13, and GH = JK = 5. Which theorem proves △GHI ≅ △JKL?	**HL**

PART 2 · APPLY IT

1. **Yes, the braces are congruent by HL.** Both braces are right triangles. Their hypotenuses and one pair of legs are equal, so use HL.
2. **Yes, the triangles are similar by AA.** Two pairs of corresponding angles are equal. Therefore, the triangles are similar by AA.

CHALLENGE

x = 8; △ABC ≅ △DEF by SAS.

Accept congruence statements only when vertices are listed in corresponding order. For similarity, accept either the word similar or the symbol ~ with AA.