LESSON MAKER PRO

Triangle Match Test

Check sides, angles, and corresponding vertices.

HIGH SCHOOL · GDA.GM.E.25.a

GDA.GM.E.25.a "Verify that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent."

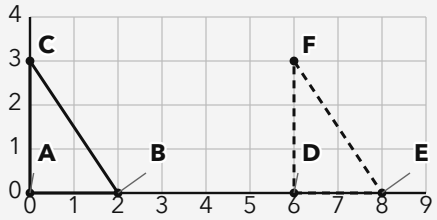
NAME _____ DATE _____

HOW TO VERIFY A MATCH

Two triangles are congruent if and only if every pair of corresponding sides and angles is congruent. You can verify congruence with SSS: if all three pairs of corresponding sides match, the corresponding angles match too.

WORKED EXAMPLE

Are triangles ABC and DEF congruent? Use the grid.



1. AB = DE = 2, and AC = DF = 3.
2. BC = EF = sqrt(2^2 + 3^2) = sqrt(13).
3. The three side pairs match, so SSS verifies congruence. The corresponding angle pairs match too.

Answer: Yes. Triangle ABC is congruent to triangle DEF.

PRACTICE 4 problems

1 Triangles ABC and DEF each have three 8-cm sides and three 60° angles. Are they congruent?

ANSWER _____

2 Triangle ABC is congruent to triangle DEF. If AB = 9 cm and angle B = 47°, find DE and angle E.

ANSWER _____

3 Two triangles each have three 60° angles. One has 8-cm sides; the other has 9-cm sides. Are they congruent? Why?

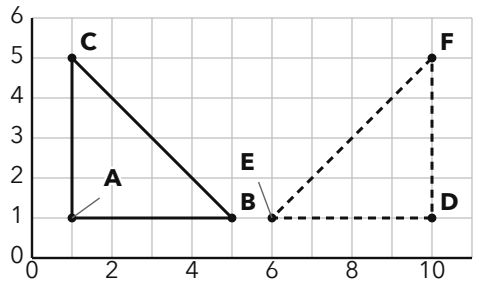
ANSWER _____

4 Triangle ABC is congruent to triangle DEF. If AC = 2x + 1 and DF = 15, find x.

ANSWER _____

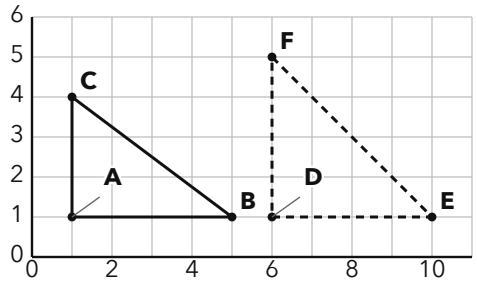
APPLY IT Show your work

1 Two teams design triangular decals on a 1-cm grid. Can one decal cover the other exactly? Use the grid to justify your answer.



ANSWER _____

2 A game designer places two triangular hit zones on a 1-unit grid. Would one zone cover the other exactly? Explain.



ANSWER _____

CHALLENGE One step up

AB = DE = 7, BC = EF = 8, and AC = DF = 9. A student says you must measure all six angles before deciding whether triangles ABC and DEF are congruent. Explain why that is not necessary, and name the three corresponding angle pairs.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Triangles ABC and DEF each have three 8-cm sides and three 60° angles. Are they congruent?	**Yes, triangle ABC is congruent to triangle DEF.**
2	Triangle ABC is congruent to triangle DEF. If AB = 9 cm and angle B = 47°, find DE and angle E.	**DE = 9 cm; angle E = 47°.**
3	Two triangles each have three 60° angles. One has 8-cm sides; the other has 9-cm sides. Are they congruent? Why?	**No. Their corresponding sides have different lengths.**
4	Triangle ABC is congruent to triangle DEF. If AC = 2x + 1 and DF = 15, find x.	**x = 7.**

PART 2 · APPLY IT

1. **Yes. Triangle ABC is congruent to triangle DEF.** AB and DE are each 4 cm, as are AC and DF. Both remaining sides are 4sqrt(2) cm, so SSS verifies congruence and the corresponding angles match.
2. **No. The triangles are not congruent.** AC is 3 units, but its corresponding side DF is 4 units. Since a corresponding side pair differs, the triangles cannot be congruent.

CHALLENGE

SSS verifies that triangle ABC is congruent to triangle DEF, so measuring the angles is unnecessary. Angle A matches angle D, angle B matches angle E, and angle C matches angle F.

Accept SSS or a rigid motion as a congruence justification. Matching angles alone do not verify congruence.